

**BINDURA UNIVERSITY OF SCIENCE EDUCATION
GEOGRAPHY DEPARTMENT**



PROJECT TITLE

**THE CONTRIBUTION OF ZIZIPHAS MAURITIANA TO RURAL HOUSEHOLS
FOOD SECURITY;INCOME AND WELFARE.A CASE OF MUKUMBURA
WARD 2,MT DARWIN DUSTRICT.**

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UNIVERSITY OF SCIENCE EDUCATION IN PARTIAL FULFILLMENT OF
THE REQUIREMEMENTS OF THE BACHELOR OF SCIENCE HONOURS
DEGREE IN DEVELOPMENT STUDIES.**

**DATE
MAY 2013**

APPROVAL FORM

The undersigned certify that they have read this dissertation and have approved its submission for making after confirming that it conforms to the departmental requirements.

.....

Supervisor

.....

Date

DECLARATION

I declare that this project is the best of my knowledge, my original work except where sources have been acknowledged. The work has never been submitted nor will it ever be, to any other university for awarding degree.

Student name.....

DEDICATION

To my late parents Leonard Mutenje and Elizabeth Mutenje nee (Makoni) for their lifelong lessons of selfless compassion.

ACKNOWLEDGEMENT

I would like to sincerely thank my late parents , Mr Leonard and Mrs Elizabeth Mutenje for their long life lessons. My family members Dr Munyaradzi Mutenje, Eddie, Tongai, Austin and lovely sister Linda for their early teaching that life is not painless, scaling their own walls and leaving directions. Wife Talent Mudondo and daughter Tawananyasha, because of you it makes sense.

All special thanks to Ms Mudavanhu whom without this work would not be possible. Thanks for the faith and the room to grow the fundamentals ingredients of true education. I thank all the Geography department staff for sharing wisdom.

ABSTRACT

Households throughout Mukumbura ward 2 depend on non-timber forest products (NTFPs) such as fruit, leaves, pulp, bark and roots. This research undertaken in three villages in Mukumbura ward 2 that include, Chingawo, Chimunda and Rukodzo documents the contribution of *Ziziphus mauritiana* NTFPs to rural household income, food security and welfare. Evidence presented showed that *Ziziphus mauritiana* products contributed to household income and food security through different NTFPs enterprises that include fruit selling, beer brewing and general consumption of fruits by the villagers. The income serve as subsistence safety nets during times of shocks such as illness and drought thus income was used for immediate household requirement, school fees, clothes and buying agricultural inputs. The contribution of *Ziziphus mauritiana* NTFPs to household income, food security and welfare in Mukumbura ward 2 were determined using primary and secondary data and these include questionnaires that were distributed to 32 sampled household. Questionnaires were designed to establish types of products used, quantities used, sources of income and challenges faced by households in improving the use of NTFPs. Interviews and focused group discussion were used to triangulate data from questionnaires. The research have indicated that household communities in Mukumbura ward 2 derive cash income from NTFPs and they act as safety nets during times of shocks such as drought. The study also revealed that many households are facing economic challenges such as marketing because of poor infrastructure and poor prices, social factors and ecological.

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Acronyms

AIDS-Acquired Immune Deficiency Syndrome

CIFOR –Centre for International Forest Research

CSO –Central Statistical Office

HIV –Human immune deficiency

GMB -Grain Marketing Board

IIED -International Institute of Environment and Development

NTFPs -Non Timber Forest Products

NGOs–Non Governmental Organization

SAFIRE –Southern Alliance for Indigenous Resource

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CHAPTER 1

1.1 Introduction

Most rural economies in Africa rely much on agriculture; rural people depend much on agriculture activities as their livelihood. Approximately 95% of people in Mukumbura rely much on agriculture activities for example cotton farming as their main source of livelihoods (C.S.O, 2012). Global macro-economic shocks have led to decline and fluctuations of cash crops prices particularly cotton compounded with recurrent droughts and erratic rains in marginalized areas. This has undermined the importance of farming as the main source of income and food for rural households in Southern Africa (Floppers and Dechainex 2006). Increase in agricultural failures leading to low dietary diversity, low capital accumulation and food insecurity thus increasing the vulnerability of rural communities to economic, health and natural shocks. Therefore alternative sources of nutrition; food, income generations and food security need to be introduced by enhancing livelihood diversification to supplement the basic needs in short supply. The research focuses on the ability of rural marginalized communities of Ward 2 in Mukumbura communal area to drive *Ziziphas mauritiana* (NTFPS) to improve livelihoods. Due to increase in livelihood shocks and other related hazards, NTFPS such as *Ziziphas mauritiana* commonly known as Musau play important role in poverty alleviation to communities in Mukumbura area by supporting rural livelihoods and food security. In Luapula and Northwest province of Zambia NTFPS contribute 50% of household income. NTFPS are important in rural livelihoods because they are easy to access, no special skills and inexpensive extraction technology required to harvest and less capital investment is required to extract them. This chapter presents the background to the problem, the statement of the problem, justification, research objective, research questions, delimitations and limitation of the study as well as the definition of terms.

1.2 Background to the study

In tropical forest and marginal rural areas, the non-farm component has attracted considerable attractions because of the growing importance of rural production decline as

they act as safety nets to poverty alleviation (Reardon et al, 2000). Diversification of rural livelihoods through the use of NTFPs helps families to smoothen income and food supply fluctuations given seasonality inherent in agriculture production (Upton, 1996). International debates on diversification of livelihoods through use of forest products and the role of NTFPs in rural areas to subsistence and development through improving food security, generate income, reduce poverty and degrade the natural forest ecosystem and the measures which can be taken to restore the degraded environment have been a center stage among forest and development debates at international level (FAO, 2003). Despite these efforts, most developing countries fail to put an end to poverty alleviation among many people in marginalized communities at the backdrop of some natural resources.

In marginal areas such as Mukumbura, communal people experience poor harvest in times of drought (FAO, 2008). The area experience low and erratic rainfall that have been exacerbated by increase in global climate change and the natural resource base has narrow capacity to sustain rural livelihoods. The penalties are visible and seriously increasing causing many households to be vulnerable to income shocks, food insecurity causing a decline in the wellbeing . Due to vulnerability to these shocks this has resulted in degraded; environments, poor diet and high level of poverty. All this happen at the backdrop of natural resource such as *Ziziphus mauritiana* as a tree, which can haul up their rural standard of living. NTFPs in Mukumbura can be of potential value in helping to alleviate hunger, generate income and determine how to reduce poverty in Mukumbura.

Due to the increase in economic shocks such as escalating prices of basic commodities and decline of cotton prices, high inflation rate for the past decade in Zimbabwe has caused households to diversify their livelihood from agriculture to off farm such as collection NTFPs such like *Ziziphus mauritiana*. Exposure to these shocks has been exacerbated by rampant occurrence of drought in the rural area, creating fluctuations in income, consumption and wellbeing in most rural areas in Zimbabwe as (Mutenje et al,2011). Communities around Mukumbura communal areas experience several livelihoods shocks such as crop failure due to droughts, livestock loss and theft, death of household member due to HIV and AIDS related illness and deaths. This had caused people in the study area to seek alternatives to improve diversification of livelihoods through the use of *Ziziphus mauritiana* (NTFPs) to improve rural standards of living as they have potential to act as safety nets to livelihoods, (Ellis and Freeman, 2005).

Ellis and Freeman (2005) pointed out that NTFPS contribute to poverty alleviation by acting as safety nets, which reduce vulnerability of rural communities to risks such as hunger and famine when crop fail or illness strikes. Sheckleton *et al* (2007) postulated that NTFPs do not only provide options for poverty reduction but may provide path ways out of poverty, thus they have a potential to act as safety net. This study assesses the contribution of *Ziziphas mauritiana* product to household food security, income and wellbeing. Sheckleton *et al* (2007) also pointed out that NTFPS are easy to access because harvest is characterized by open access, low skills and capital requirement making these products attractive to poor households. They can also contribute to reduction in poverty by providing operational capital for other important livelihood activities such as farming and off- farm activities.

1.3 Statement of the problem

Millions of people throughout the world make extensive use of biological products from the wild including those who reside in marginal lands of Mukumbura communities. These NTFPs are harvested for both subsistence and commercial use, either regularly or as a fall back during time of livelihood shocks. NTFPs add value to livelihood security especially for rural dwellers like those of Mukumbura. Odebode (2005) postulated that little research has been undertaken on the contribution of NTFPs to rural household, he further stated that little research focusing on the full potential of these NTFPs for income generation, food security and welfare improvement of rural folk.

Despite the growing appreciation of the role of NTFPs in rural subsistence and development people in Mukumbura ward 2 are still facing precarious livelihoods strategies due to their vulnerability to harsh socio-economic changes brought about by frequent droughts and economic challenges. Due to exposure to adverse shocks and risks families do not produce enough food, leading to an increase in food insecurity, human misery, diseases and starvation and persistence level of poverty. Although communities in Mukumbura tried to diversify their livelihoods through barter trade of livestock with food, gold panning to generate income, the contribution of these livelihoods strategies is insignificant to improve optimum human welfare. This research determines NTFPs extracted from the *Ziziphas mauritiana* tree that can be of socio economic value to rural

people and assess the contribution of these to poverty alleviation in marginal lands such as Mukumbura ward 2.

1.4 Justification

Studies have shown that previous work on exploitation of *Ziziphus mauritiana* has been concentrated on the sustainable utilization of these product ignoring the social and economic aspects. The research seeks to find out how people can benefit from *Ziziphus mauritiana* as a source of sustainable livelihood in times of shocks such as drought. Odebo (2005) postulated that little research has been undertaken on the contribution of NTFPs to rural household, he further stated that little research focusing on the full potential of these NTFPs for income generation, food security and welfare improvement of rural folk. The research investigates on the social and economic importance of the dominant NTFPs in Mukumbura.

It is believed that the use of the research findings will help to promote use of *Ziziphus mauritiana* products by local people as a valuable component in the process of alleviating poverty and economic development. The research aims at exposing potential value of *Ziziphus mauritiana* to the local communities so that many people will use it as a livelihoods strategy. Ellis (2005) noted that NTFPs forms part of natural capital which can benefit rural people to achieve other assets such as human capital, social, financial and physical assets. The knowledge obtained from the research can assist in improving livelihoods strategies to the communities that depend on natural resource.

This research provide information about other alternatives that can be explored in order to improve rural livelihoods of the people in Mukumbura ward 2 using the available *Ziziphus mauritiana* resources in the area. Thus providing awareness of the contribution of the *Ziziphus mauritiana* to household economies, food security and conservation of bio diversifyings could be of vital use to poverty alleviation programs and to NGOs with an interest in the diversification of livelihoods in communal areas such as SAFIRE. Forest and development debate at international level that focus on how forest products contribute to the millennium development goals especially goal number one of eradicating poverty and hunger by 2015 (FAO, 2003).

The research findings are of major importance to policy makers, it helps them to develop forest policy that include the production of NTFPs and agro forest schemes. The findings are also important as conservation measures will be taken to maintain tree species, which has ecological function in the ecosystem. The local communities will gain knowledge on how to use forest resources sustainably so as to improve their livelihoods .The research work may further encourage further production, processing and marketing of *Ziziphas mauritiana* products particularly at community level .The research can also add value to academics and students who want to understand the harvesting and production of *Ziziphas mauritiana* as an income generating activity and poverty alleviation strategy

1.5 Aim

The study aims to investigate the contribution of non–timber forest products *Ziziphas mauritiana* to household income, food security and socio –economic wellbeing

1.6 Research objectives

1. To identify the non- timber forest products extracted from *Ziziphas mauritiana* by households in ward 2 of Mukumbura.
2. To assess the socio–economic benefits that local people derive from the use of *Ziziphas mauritiana* products in ward 2 of Mukumbura communal area.
3. Assess the challenges faced by communities in sustainable utilization of NTFPs.

1.7 Research question

1. What non-timber forest products are extracted from *Ziziphas mauritiana*?
2. What benefits do the local communities in Mukumbura derive from NTFPs ?.
3. What challenges are faced by the local people in Mukumbura ward 2 in sustainable utilization NTFPS?

1.8 Delimitation of the study

The research focuses on the contribution of *Ziziphas mauritiana* as a fall back to persistence of poverty and falling livelihoods in ward 2 of Mukumbura communal area

where there is abundant numbers of *Ziziphas mauritiana*. The unit of study in the research is a house hold. The communal area has five villages and the research is going to be carried in the entire village within the ward. The research concentrate on the socio-economic factors influencing the harvesting of *Ziziphas mauritiana* products in the area. The research also focuses on the capacity of *Ziziphas mauritiana* in poverty alleviation, generating income, promoting food security and improving livelihoods to local people to supplement short falls.

1.9 Limitations

In order to collect data frequent visits to the study area were done which was expensive because of financial limitations. There was also political misconception as the respondents decided to politicize the study. To avoid that, the researcher explained the purpose of the research which was mainly for study reason. There was limited time for data collection to come with reasonable conclusion, however; the researcher used questionnaire, interviews and focused group discussion for triangulation of the findings.

1.10 Definitions of terms

Livelihoods; means of making a living indicated by adequate stocks and flows of food and cash to meet basic needs in times of crisis

Vulnerability is defined as the likelihood of an individual or group of people to experience negative physical, social and economic shocks that will make them fail to cope without external assistance

Non-timber forest products (NTFPs) means wild plant and animal products harvested from forests, savannahs and other natural vegetation types.

Safety nets means payments or other provisions designed as a last resort to ensure that no one in a society falls below a certain minimally acceptable level of real disposal income.

Poverty means lack of basic essential items needed for survival or a condition characterized by severe deprivation of basic human needs which include food, safe

drinking water, and facility for sanity, good health, education and adequate information.

Rural livelihoods diversification is the process by which households construct diverse portfolio of activities and social support capabilities for survival and in order to improve their standard of living .

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

NTFPs play a fundamental role in poverty reduction for poor rural people; this comes in two forms, direct as food and indirect as addible products. The direct contribution include the supply of goods such as fruits, vegetables, resin, fibres, fuel wood, charcoal, bush

meat and medicinal plants which could be commercialized for money or consumed at household level. In Nigeria, 80% of rural households depend directly on NTFPs for wood energy for cooking and preservation of food and food accessories such as fish wild fruits according to Jimah (2006). This chapter reviews the essential of NTFPs as a plummet support mechanisms in rural livelihoods of people in the marginal areas at local, national, regional and international level. Various hypothetical and practical ideas concerning the use of NTFPs are analyzed. The chapter focuses on how the *Ziziphus mauritiana* contribute to income generation, food security, welfare and poverty alleviation and sustainable use of NTFPs in different societies.

2.2 Non Timber Forest Products and Food Security

In developing countries 80 percent of the population use forest products as source of food during periods of hunger and also for personal use (Anon, 2004). In Nigeria food security of rural dwellers has improved by growing trees at home gardens and on farms. NTFPs such as leaves, rattan, honey, saps and gums are important source of income for many households in Nigeria (Odebode, 2005). He also pointed out that edible food found in forest such as fruits, leaves, roots, fungi, insects and fish have superior nutritional quality when compared with domesticated varieties. The processed and stored forest food products help to insure a year round food supply for rural households. (FAO;2008). NTFPs contribute indirectly to rural household diet as they provide a habitat for wild animals and fish, thus providing fodder for livestock.

Odebode (2005) postulated that out of rural household spend income realized from NTFPs to purchase food to maintain their families. Incomes from these products provide a supplement to the economic status in lives of generality of rural dwellers. Anon (2004) dependency upon seasonal NTFPs can help to ensure food security to household in Mukumbura ward 2. The Figure 2.1 below shows the flow chart showing the relationship between NTFPs and household food security

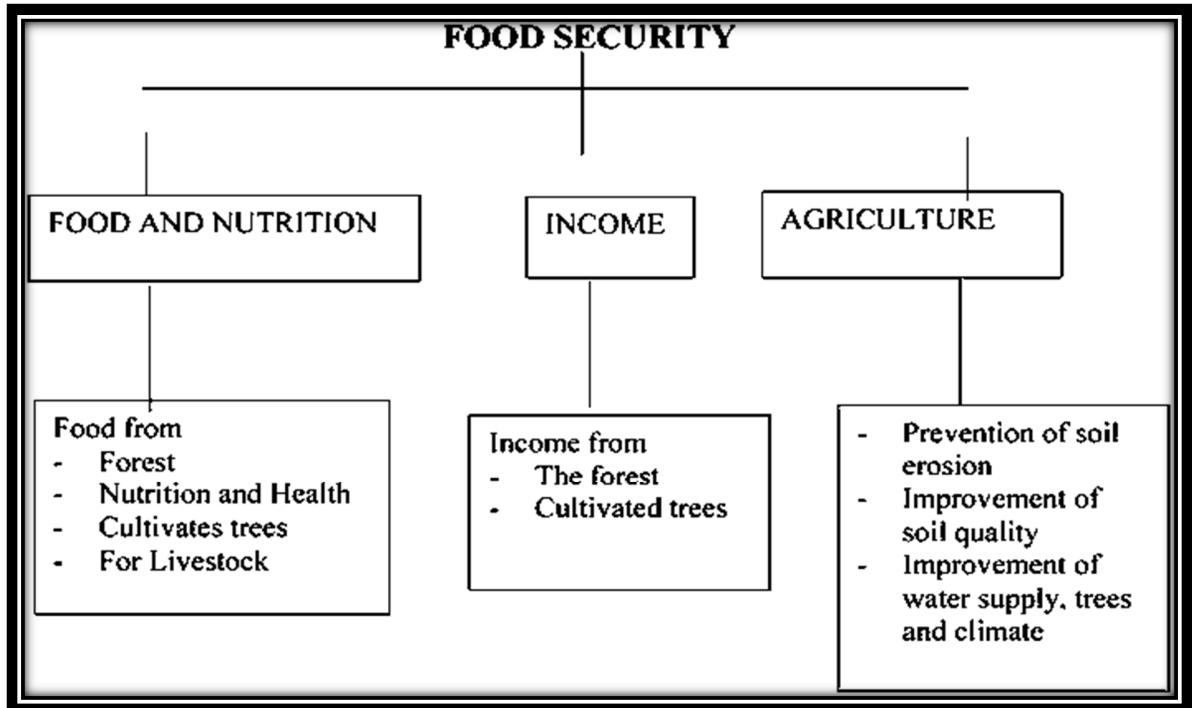


Figure 2.0 Flow chart on Non-timber Forest Products and Household food security

Source: Odebode (2005: 16)

Shekleton and Shekleton (2004) postulated that NTFP products which contribute to food security, come in the form of fruits such as *Ziziphus mauritiana* which can be eaten fresh or dried and eaten as full meal or as snacks to ease hunger at home while before the actual meal is ready. It is estimated that 70% of rural population in Sub Saharan Africa depend on nonfarm activities such as *Ziziphus mauritiana* for income and food security particularly during the hunger season when crops are out of season (Timko et al, 2004). This research has focused on both benefits societies had enjoyed from *Ziziphus mauritiana* products and looked at how the extraction of the products have helped to improve their wellbeing.

2.2.1 Fruits

The *Ziziphus mauritiana* fruits have been used in many parts of the world during dry season as the source of food. The fruits are used as raw, dried, powdered and made into porridge, juice and sometimes made into beer in India (Nyanga et al 2008). The fruits

are known to be rich in vitamin C content which is much higher than citrus and it is high in phosphorous ,carotene and calcium content according to (www.underutilised.species.org, 2012). In Botswana indigenous fruit trees play a vital role to people living in rural areas as they provide as source of food as they are eaten fresh or dried during periods of crop failure (Motlhanka et al,2008) . The harvested fruits are consumed fresh by the local people in Muzarabani ward. Figure 2.2 below shows *Ziziphas mauritiana* found in Muzarabani.



Photograph 1 *Ziziphas mauritiana* fruit tree found in Muzarabani, showing ripe +(yellow/ orange) and unripe fruits (green).(Nyanga etal 2008)

Banda et al (2007) found that surplus fruits from *Ziziphas mauritiana* tree in Zambia are sun dried and processed latter in to various products such as porridge, traditional cakes and various powder drinks that provide as source of food to rural people. Mupendembe (2004) concurs that NTFPs such as wild fruits constitute a regular part of the diet in much of rural Africa. Motlhanka et al (2008) says Eastern Ghana relied on forest products as dried fruits to meet 30% of their food requirements during the dry periods thus *Ziziphas mauritiana* abundantly found can act as a fall back mechanism to marginalized people of Mukumbura .

The *Ziziphus mauritiana* fruits have been used in various parts of the world during periods of food shortages. The dried fruits were used for porridge eaten during breakfast or as meal during times of hunger by the whole family. In Muzarabani the porridge is made by mixing water and *Ziziphus Mauritiana* powder followed by boiling while stirring and some small amount of mealie meal can be used (Nyanga et al, 2008).

Nyanga et al (2008) commented that dried *Ziziphus mauritiana* fruits in Mudzi can be pounded to produce powder that can be used to make traditional bread. The traditional cake is made from small amount of *Ziziphus mauritiana* powder by mixing it with small quantities of water to enable it to be moulded into desired shapes, that are consumed as snacks between meals or as full meals during periods of droughts. Saka and Karadeniz (2003) pointed out that in western Sudan cakes resembling gingerbread are made from a mixture of dried and fermented fruit pulp.

Nyanga et al (2008) commented that *Ziziphus mauritiana* can also produce juices locally known as Mahewu. The dried fruits together with seeds are pounded using pestle and mortar and mixed with water to make slurry. In Mudzi this is left in the sun for few hours and then consumed as beverage. In India juices from NTFPs play vital role as they are taken before meals to reduce hunger and most communities in that country have been using it to reduce malnutrition (Andel, 2006)

2.2 .2 Leaves

The *Ziziphus mauritiana* leaves have been used in various parts of the world during the dry season as source of fodder. Due to scarcity of pastures in the dry season in Rushinga *Ziziphus* leaves plays an important roles as fodder for livestock ;it provide excellent source of vitamin C and it is high in phosphorous ;carotene and calcium content which made it very nutritious for animals. The research sought to find out when communities in Mukumbura ward 2 extract leaves for fodder.

NTFPs play as safety net to rural household farmers. Mupendembe (2004) notes that due to high cost and scarcity of chemical fertilizer communities use leaves from trees such as

Ziziphas mauritiana as source of fertilizer. In Hausa west Africa people collect leaves to make compost for organic manure to substitute chemical fertilizer and reduce the cost of farming (Timko, 2010).

2.3 *Ziziphas mauritiana* NTFPs and Income Generations

Ziziphas mauritiana products contribute to the wellbeing of people, especially to low income earners in rural areas as they will be involved in NTFPs enterprises (Ezebilo and Mattson, 2010). *Ziziphas mauritiana* NTFPs has been used in different countries and societies to generate income to supplement insufficient sources of income failing to meet family demands. In Mexico and Bolivia NTFPs contribute to poverty reduction by supplementing income from more important farm and off farm income generating activities. Mayer (2007) pointed out that NTFPs can be used by millions of people to sustain livelihoods, basis for risk mitigation, meet contingent needs, act as stepping stone out of poverty and play an important role in the gap filling of the rural poor.

During the periods of low agricultural production, better off households use forest products to complement and improve the household economy while poorer households who find livelihoods difficult to sustain may rely on the forest products as the primary means of survival in crisis periods (www.ifad.org, 2013). Sunderland et al (2004) postulated that NTFPs provide economic safety net through product diversification and as a coping strategy. Ghosal (2011) estimated that 1 billion people in world over earn their cash from forest related activities. The sale of wild fruits in three villages in Zambia contribute to 59% of farmers total cash income (Mulenga et al, 2011). This research find; out at opportunities for *Ziziphas mauritiana* products such as fruits, pulp, bark, leaves and roots can generate income in Mukumbura ward 2. The research sought to look at market opportunities in community and country side that could promote commercialization of the *Ziziphas mauritiana* products.

Belcher (2004) commented that people in India and Nepal rely on NTFPs products to meet household needs. Sixty percent of household in Ghana generate income to supplement agricultural incomes from the extraction of NTFPs (Rijal et al, 2009). Farmers in West Africa diversified sources of income by collecting and selling NTFPs to

minimize of effects of declining prices of cocoa and coffee at world market. This suggests that low crop production in rural communities can result in extraction of forest products to earn a living. The research explores opportunities for sale and income generation from *Ziziphas mauritiana* products when the main crop fails to meet household needs. CIFOR (2004) commented that the sale of NTFPs can compete with cash crop in poverty alleviation thus the need to find out the economic contribution of accrued from *Ziziphas mauritiana*.

Mayer (2007) found out that in Tanzania among the Shinyanga people, the sale of forest products contribute US\$23 per month. The money is used to pay school fees and to meet other household needs. Bark harvesting in Mount Cameroon proves to be lucrative as each member earned around US\$67 per month. The money is used to pay fees, household immediate demands and to purchase agricultural inputs.

Ziziphas mauritiana products can generate income through NTFPs enterprises such as beer brewing .In Mudzi and Muzarabani, Nyanga et al (2008) noted that they produce a fermented *Ziziphas mauritiana* beverage, The dried pulp is mixed with water (approximately 1:10 ratio of pulp: water) and left to ferment spontaneously for 6–7 days .The fermented pulp is transferred to drum and distilled to obtain the spirit called Kachasu. The sour type of *Ziziphas mauritiana* is preferred for making Kachasu as it is considered to give the spirit of better taste .In Mudzi 300 millitres cost about US\$ 1 and most households supplement their income through beer selling though it is illegal. According to SAFIRE baseline survey (2003) most households in the Zambezi valley area earn a lot of cash from sale of beer made from *Ziziphas mauritiana* pulp. In Zambia *Kachasu* beer is most common in most rural parts and a lot of families have been able to earn a living through such NTFPs enterprises (Banda, 2007).

2.4 Medicinal Uses of *Ziziphas mauritiana*

Mayer (2007) noted that NTFPs provide a variety of medicinal values globally. Medicinal plants are vital where health centers are too distant or too costly in the area. Pressure in one clinics in Mukumbura ward 2 reduce access and provision of health care facilities for many people in the area. UNDP (2003) commented that hospitals in Zimbabwe are recording acute shortages of drugs and qualified medical staff, this

increase the dependence of many rural communities to natural medicine. UNAIDS (2003) observed that in the absence of proper treatment, people can live longer by taking in natural medicines and natural food locally available. *Ziziphus mauritiana* is the dominant tree species in the area thus the research sought to explore the potential of *Ziziphus mauritiana* to solve health problems

Ziziphus mauritiana is used to treat a variety of ailment including cold and flu because the fruit contains high content of vitamin C. In addition, fruits can also treat malnutrition related diseases in children. Decoctions of the roots can be used to treat culsions in children and stomach pains (www.underutilised.species.org; 2012). *Ziziphus mauritiana* serves a vital role in improving the health status of people. The research sought to explore the potential of fruits and roots to solve health ailments in Mukumbura ward 2.

Ghosal (2011) commented that vitamin C in fruits and pulp help in reducing blood pressure and enhancing immunity against many tropical diseases as well as lowering incidents of cataracts and coronary diseases. NTFPs such as bark, fruit, and leaves are now recognized as basis for critical human health in underdeveloped nations (Diederichs, 2006). He goes on further to say that 80% of world population in developing countries depends on traditional medicine for primary health care. In South Africa 35000 to 70 000 tonnes of plant materials are consumed per year as medicine .It is speculated that the growth in the informal market for traditional medicine and herbal remedies has been fueled by HIV/AIDS pandemic in the region (Mutenje et al, 2008). The research sought to find out if the *Ziziphus mauritiana* products have the potential to treat ailments in the communities given there are health service centers.

2.5 Challengers of sustainable utilization of Non-timber forest Products

Although various studies highlighted the importance of NTFPs for many marginalized rural communities. Sustainable contribution of NTFPs to rural livelihoods have been hindered by ecological, economic and social challenges (Ros-Tonen and Wiersum (2003). They also pointed out that utilization of NTFPs for commercial purpose has the ecological impact including gradual reduction in the vigour of harvested plants, decreasing rates of seedlings of establishment of harvested species, potential disruption of

level of population and nutritional loss from harvested material, (Mutenje et al (2011). Anon (2006) observed that a decrease in vitality of *Genuetum Africana* tree species in Ghana have occurred as a result of harvesting parts of its bark for use in beer production.

The trade of NTFPs in Zambia has been hindered by marketing problems such as lack of information on potential markets and market channels, the fragmented nature of NTFPs markets (Ros–Tonen and Wiersum ,2003). The perishable nature of many products combined with poor infrastructure and high transport cost in remote areas of Zimbabwe hindered the successful marketing of NTFPs (Nyanga et al 2008). This research sought to find out if commercialization of NTFPs in Mukumbura is affected by these marketing factors.

Lack of organization among harvesters, lack of credit to improve value addition and lack of better facilities such as technologies that helps to improve sustainable commercialization of NTFPs in Zimbabwe. Mupendembe (2004) pointed out that lack of proper social networks among villagers in areas where their NTFPs have hampered the success of these products in alleviating poverty in most parts of Africa, thus affecting negotiating skills.

2.6 Conclusion

Ziziphas mauritiana has the potential to generate household income and food when the agricultural production fails .Commercialization of NTFPs helps to create employment and household income for it to be viable opening of new markets and increase the value addition of the products. Researches have shown that *Ziziphas mauritiana* are used differently in various communities.Each country concentrates on different products such as Mozambique favour beer brewing using the fruit,Zimbabwe rely on the marketing of the fruit .Research have indicated that mostly the poor and woman as well as disadvantaged children often extract *Ziziphas mauritiana* products that the rich.

CHAPTER 3: METHODOLOGY

3.1 Introduction

Data for this research was collected using both primary and secondary data sources .This chapter gives an overview of the study area, sampling techniques used, the research design, data collection procedures and data analysis techniques adopted

3.2 Research design

The researcher used both qualitative and quantitative research methods. Qualitative methods are non-numerical data collection strategies. These methods are used to gather an in-depth understanding of human behavior and the reasons that govern such behavior. In other words, the qualitative method help researchers answer the how, why, what, where and when questions (Becker, 1996). Quantitative research refers to the systematic empirical investigation of quantitative processes and phenomenon and their relationships. The quantitative approach was used to supplement the qualitative method to account for the relationships, effects and interactions that take place in society

3.3 Research Instruments

The collection of data for this research was done by use of both primary and secondary data sources. This include questionnaires, interviews, focus group discussion and document analysis

3.3.1 Questionnaire

Questionnaires were the main instruments used by the researcher in collecting data. A total of 32 questionnaires were self-administered to households door to door to avoid chances of interaction between respondents and was completed through interacting with the each respondent using a questionnaire schedule (Appendix 1). Self-administering of questionnaires was done on door to door basis which helped in minimizing loss of time and delays.

Questionnaires were designed to establish the types of products used, frequency of use, quantities used, seasonality of use, longevity of durable resources, local prices and the extend of trade, harvesting modes and use of *Ziziphas mauritiana*. Also questionnaires were used to collect demographic data on household characteristics on age of respondents, sex, marital status, level of education, sources of income and livestock ownerships.

The researcher managed to extract the information from non-verbal actions that is facial expression, to demonstrate the point, clarified the questions and probed for more information. Guedge (2009) postulated that interviews produce quality data as the interviewer will be present on the spot which enables him or her to observe qualitative variables such as facial expression, feelings motives, gestures hesitations to provide the answers and the tone of the voices. In order to improve the reliability and validity of information questionnaires data were triangulated using interview guide and focus group discussion.

3.3.2 Interview guides

Interviews were used to collect primary data. The researcher used this technique to gather information from the key informants which were the ward councilor, headman, chief and traders operating in the area so as to gain an understanding of the uses and value of *Ziziphas mauritiana* to the local people. This was done using interview form (Appendix 2) to sought information from the key informants. In order to gather information about market interview schedule (Appendix 3) was used. The main questions on Appendix 2

was on types of NTFPs extracted in the communities and their potential benefits. Appendix 3 was based on the source where traders get their NTFPs, where they market and challenges they face to market these products.

3.3.3 Focused group discussion guides

Focused group discussion triangulate data obtained from questionnaires, interviews and to check quantities collected, marketing channels and other issues relating to NTFPS products such as their benefits to the local people.

In using this technique, the researcher selected groups of people within the 18 to 35 age range and then discussed topics which were determined by the researcher. The participants also included personnel from headman and community people. By bringing the respondents together, they were able to stimulate each other's memory as well as their beliefs, perceptions and feelings that were difficult to gather in other instruments like questionnaires the discussions were carried out with groups of between 8 to 12 people on the different occasions that they were held.

3.3.4 Secondary Data Source

The researcher also used literature analysis to obtain secondary data. Data for this research were collected from reports of SAFIRE (2006). The study collected data from various sources such as the journals, textbooks, dissertations and the internet on the contribution of NTFPs to poverty alleviation.

3.4 Sampling and Sampling Procedures

Mukumbura ward 2 comprises of 14 villages, selection of villages was based on purposive sampling criteria considering the proximity of each village to the forest. Three villages which include Chimunda, Chingawo and Rukodzo were selected as they are close to the forest and they have large number of NTFPs enterprises. The total number of households added up to 320 in all the three villages, Chimunda 94, Chingawo 103 and Rukodzo 123. Systematic sampling was used to select household to be interviewed using the list of villagers. The samples were then drawn from within these locations of their population sizes where samples were chosen in a systematic way that is every 5th

household was selected in each village and were there was 5th household was not there the 6th household was taken

Table 3.1 showing sample sizes

| | Chimunda | Chingawo | Rukodzo | Grand total |
|--------------------------------|-----------------|-----------------|----------------|--------------------|
| Number of households | 94 | 113 | 110 | 320 |
| Sampled Household (10%) | 10 | 11 | 11 | 32 |

3.5. Data Analysis Techniques

Information collected through questionnaires and interviews were coded and fed into the computer programme for analysis using Statistical Package for Social Science 16(SPSS). SPSS version 16 data processing tool was used for quantitative data to explore the similarities, difference, relationships associations and significant test. SPSS was also used for cross tabulations variables.

SPSS version 16 was used to test the strength of the variables and the significance of the association on categorical data such as influence of age, sex and marital status on quantities extracted in the area. SPSS version 16 test differences that exist between variables for example differences on quantities extracted among variables such as age, sex, occupation and marital status.

Descriptive statistics such as the measure of central tendency (mean and mode) for quantities collected in the area and measures of variations of collected data were calculated. Frequent tables and graphs were used to represent data collected by questionnaires and structure interviews for different variables.SPSS version 16.0 was used to plot line graph for crop production and *Ziziphas mauritiana* extraction and bar graphs and pie chart to represent collected data.

3.6 Description of the study area

Central Statistics office, (2012) postulated that Mukumbura ward 2 is situated at 252km from the capital city Harare in the north eastern direction of Zimbabwe being the border post to Mozambique. Mukumbura ward 2 is found in Mashonaland Central Province in agro-ecological region 4 where rainfall ranges from 450 mm to 500 mm, experience

single rain season and temperature ranges from 18 degrees Celsius, to 31 degrees Celsius. The area have an estimated population of 13999 and 130 average households per village. The soils were largely sandy loam of low fertility (SAFIRE 2006). Due to low rainfalls and soil types have resulted in low crop production in the area .Agricultural activities such as crop production and livestock are the cornerstone of livelihoods in the area on subsistence basis, these farmers depends on natural inputs. People in the area mainly grow maize ;sorghum for food and cotton as cash crop. Due to rampant occurrence of drought and poor soils in the area, crop production have dropped drastically since the year 2000. This have driven the study on the contribution of *Ziziphas mauritiana* to poverty alleviation in the area .

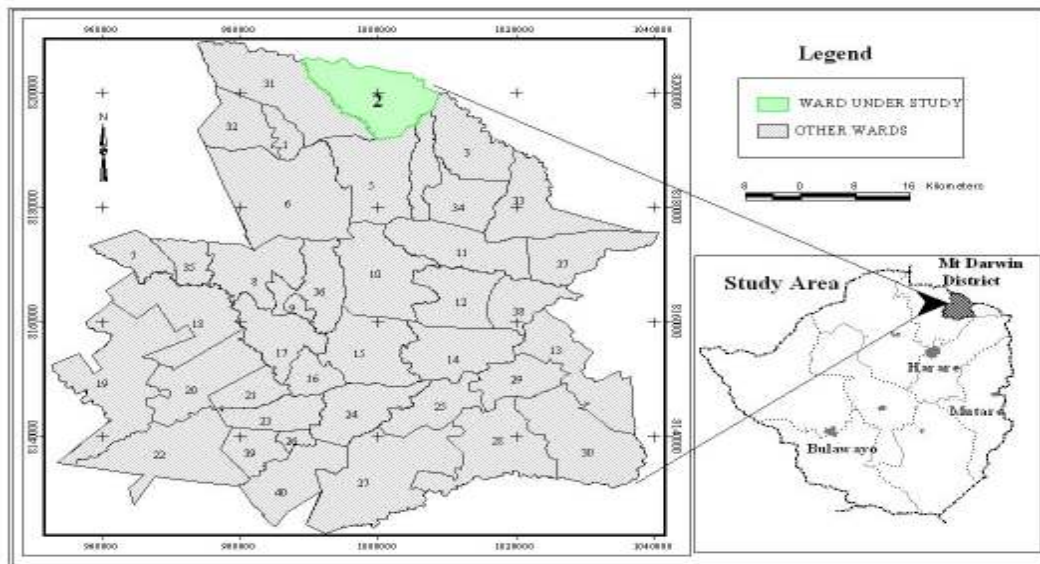


Fig 3.1 Mukumbura ward 2 in Mount Darwin District, Zimbabwe

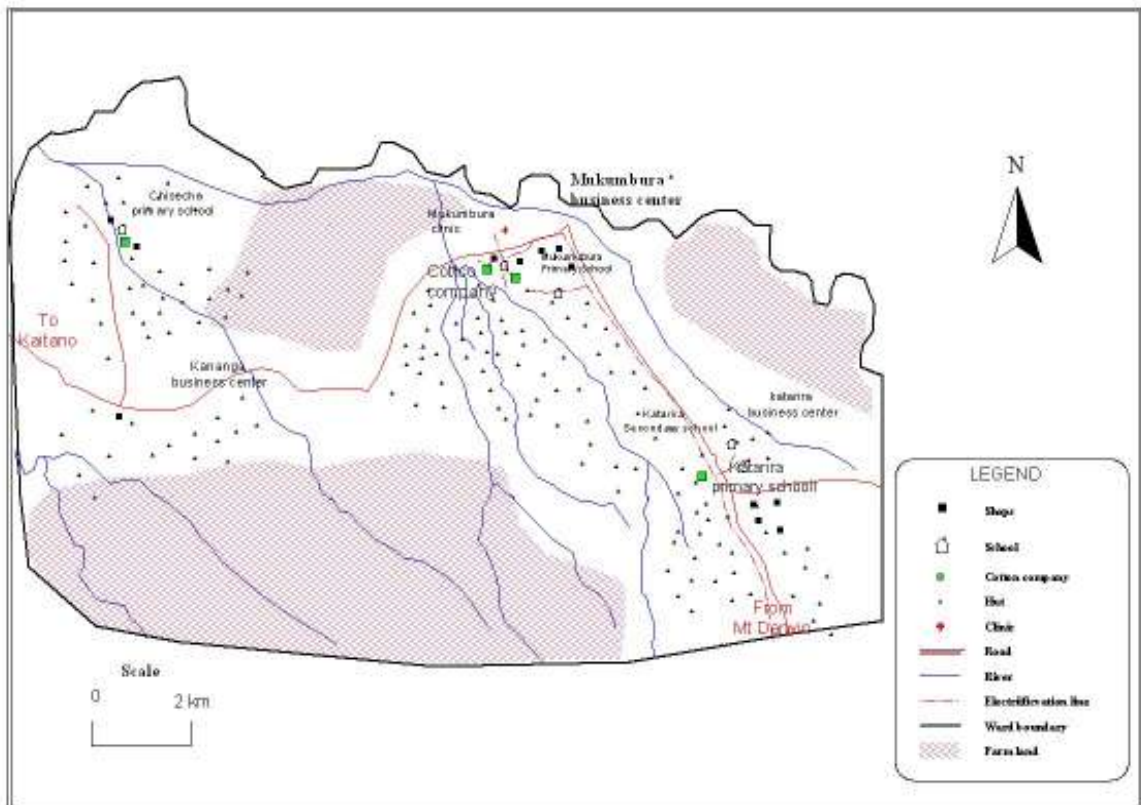


Figure 3.2 Showing the map of Mukumbura

Conclusion

In this chapter research design and research instruments were discussed as well as sampling techniques. The research was designed in way that it accommodates both qualitative and quantitative methods, but qualitative research will dominate the research. Qualitative data was coded to allow statistical analysis using data analysis package known as Statistical Package for Social Scientist (SPSS). The data was then interpreted using pie charts and graphs. Systematic sampling and purposive sampling techniques were discussed as sampling methods. Research instruments discussed include questionnaires, interviews and focus group discussions. The use of different instruments in data collection allows validity of the data collected as they complement each other.

CHAPTER IV: RESULTS PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

The chapter presents; analyses and interprets the findings. The research findings are presented according to the research objectives which guided the study. These include (a) identifying the non-timber forest product extracted from *Ziziphas mauritiana* by households in Mukumbura ward (b) assessing the socio-economic benefits that local people derive from use of *Ziziphas mauritiana*, (c) Access challenges faced by communities in Mukumbura in marketing these NTFPs

4.2 Demographic and Socio-economic Characteristics of Respondents

Demographic and socio-economic characteristics of the respondents such as sex, age, household size and composition, educational qualifications and occupation of household head were analyzed so as to find out whether they had an impact on the contribution of NTFPs to household food security, income and welfare of Mukumbura communities.

4.2.1 Age of the respondents

Age of the respondents plays a vital role in determining the contribution of NTFPs to household income, food security, and welfare .Where there are many aged people the involvement of the communities in the extraction of NTFPs is compromised .In the case where there are more young people the involvement of communities in NTFPs enterprises is very high because young people resembles the of laborwhich means more households will be involved in the collection of NTFPS

The Figure 4.1 below shows the age of the respondents in Mukumbura ward 2. The low percentages of the aged less than 10 % of the respondents are above the age of 55 years. This shows that they are high number of young and middle population (90%) indicating high dependency level. This could have a positive bearing on the impact of NTFPs in the ward.From the focused group discussion respondents pointed out that most middle aged

in the area could not seek other livelihood opportunities such as searching for urban employment because of high level of illiteracy which is dominate in the area.

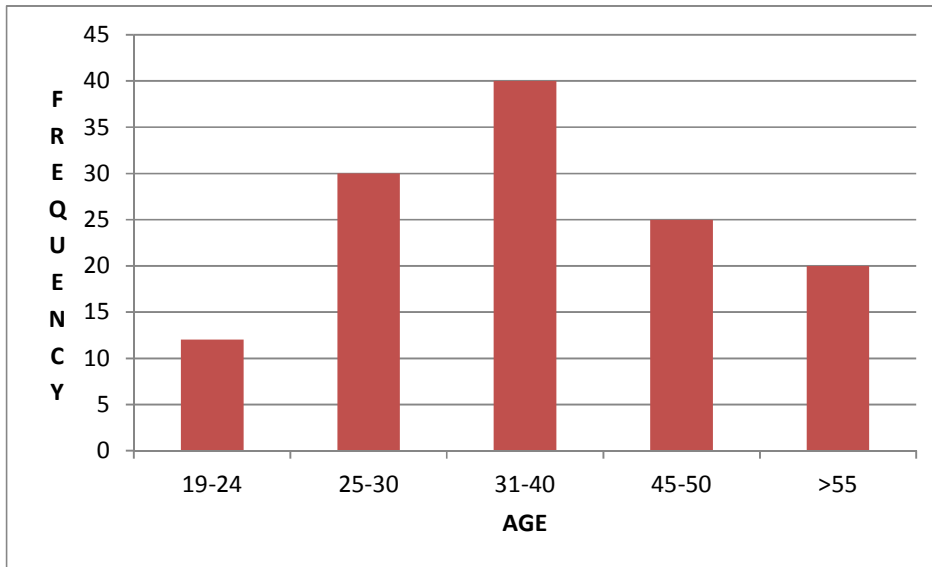


Figure 4.1 showing the age of the respondents

4.2.2 Sex of and Relationship with household head

Sex of the respondents helps to show the contribution of *Ziziphas mauritiana* NTFPs to food security ,income and overall welfare of communities in Mukumbura.If there more woman than man it shows limited livelihoods opportunities within the area forcing communities to adopt to collection of NTFPs .More women will be affected by adverse impact poverty therefore they are forced to involved in NTFPs enterprises .

Table 4.1 The relationship between sex of respondents and household heads

| Sex of respondents | H/head | Wife | Total |
|--------------------|--------|------|-------|
| Male | 10 | 0 | 10 |
| Female | 15 | 7 | 22 |
| Total | 25 | 7 | 32 |

When the sex variable is cross tabulated with the head of household as shown in table 4.1, 22 female responded that they are involved in NTFPs enterprises.The table indicates the dominance of female in NTFPs enterprises (32% male and 68% female).Some males

in most rural areas migrate to urban areas in search of employment and women remain in rural were they involved in farm and non-farm activities such as NTFPs enterprises as means of survival and to boost income. This seem to agree with www.ifad.org(2013) that stated that many women in developing countries are involved in off farm enterprises such as selling NTFPs than man.

4.2.3 Average family of respondents

The average family size in the study area is between 7-9 children (Figure4.2). The big family sizes are main common in area. This has been attributed to religious reasons since they high number of Apostolic sects in the area that encourage big families. This can also have been influence by the fact that the area is a cotton producing areas because the labour intensiveness involved in the production of this crop, (de Haan and Zoomes, 2005). This has contributed to the large families as children act as source of insurance for their parents as they grow older. This have also increase the impact of poverty since most households are not able to take their children to school and limit most young man and women access to economic activities.

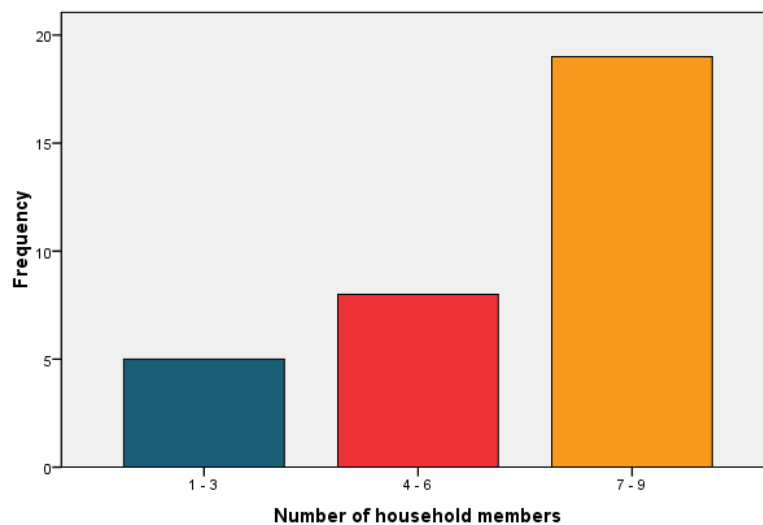


Figure 4.2 Household size of the respondents

4.2.4 Educational level of the respondents

The research has revealed that the majority of household (34.38%) have not attended school and 31.25% went up to primary level, this can be attributed to high level of poverty;religious sects such as Apostolic churches that encourage more children are dominant in the area.This could be a factor of underdeveloped rural infrastructure and remoteness,which discourage young people from going to school as schools tend to be distant.This is consistent with researches done by UNICEF that have shown that most school in rural areas are located far away reducing the productivity and potential of most children in these remote areas, (Ezebilo and Mattson,2010). The Figure 4.3 indicate that only 18.75% of household heads have attained secondary education ;this has an implication in livelihoods as it limit most household to formal employment thus promoting informal enterprises such as NTFPs enterprise. Only 15.62% have acquired tertiary education in the area of study this indicate the low accumulation of human capital which an indicator of development, thus high this reveals high level of poverty.

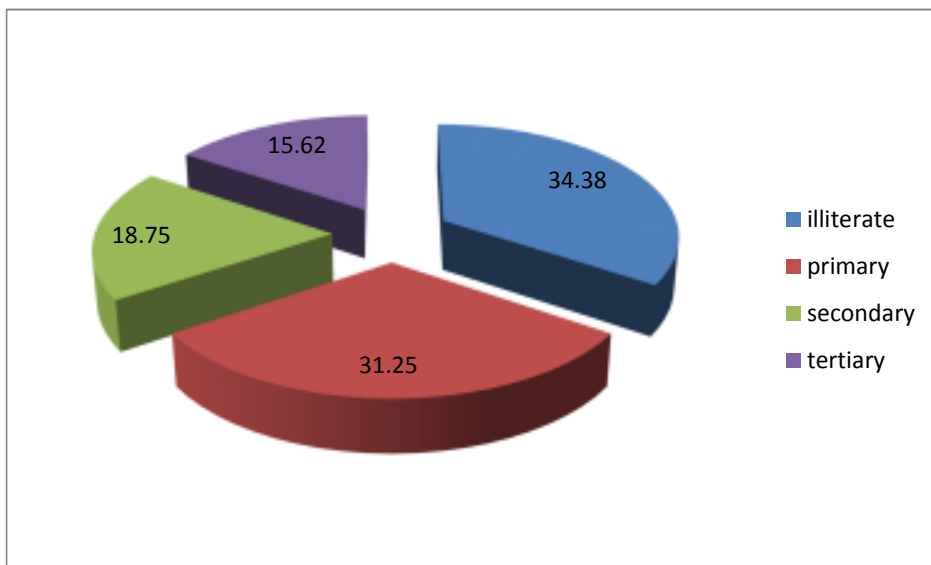


Figure 4.3 shows the education level of respondents

4.2.5 Economic activity in the area

The research also revealed that most common economic activities in these communities are farming (40%), followed non-timber forest product enterprises (30%) which contribute almost a third of the household income. Farming is the main source of livelihood for these communities. Cotton production, the primary cash crop in the area,

has declined due to decrease in world price. Results on table 4.1 have indicated that gold panning contributes only 13 % of the average income and trading contributes 16%. It can be deduced from these results that NTFPS act as safety net in to livelihoods of people of Mukumbura ward 2 particularly when people are expose to natural and economic shocks. Figure 4.4 below shows different occupational in the area

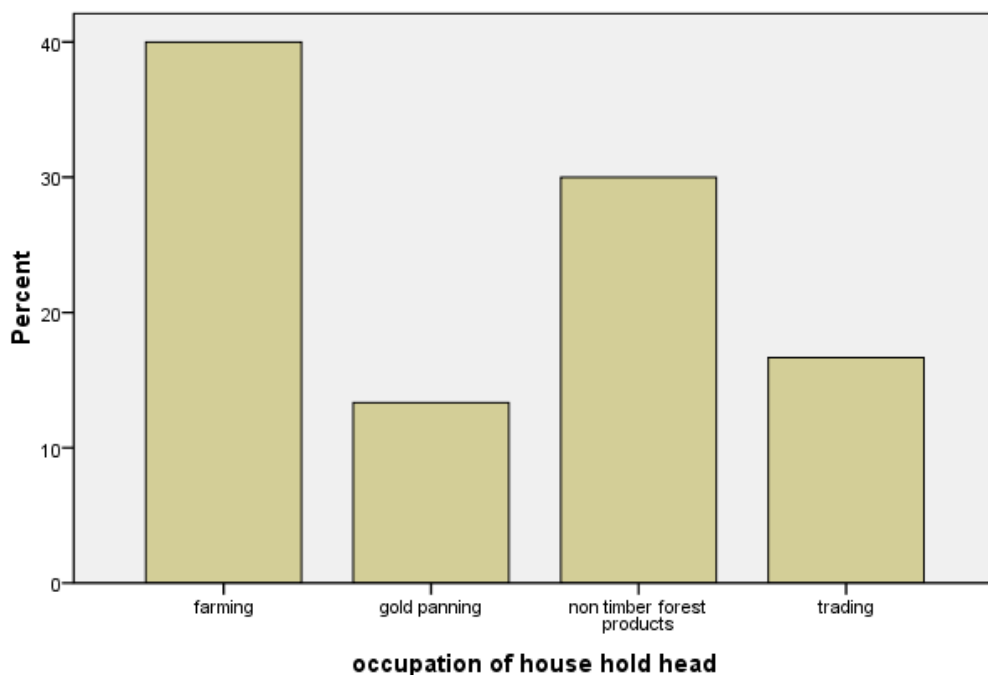


Figure 4.4 showing occupation of household heads

4.2.6 Household Assets

Household assets, broadly defined to include the physical, human capital, social, natural and financial determine the opportunity set for options for livelihoods and overall wellbeing .Household assets are portfolios that are importance determinates of agricultural potential, vulnerability to shocks and level of collection of NTFPs.

The research revealed that 90% of the sampled household have assets with a value less than USD \$2400 these include physical assets owned by each household .This is an

indication of high prevalence of poverty in the area. Only 10 % of sampled households have assets that are above USD\$ 2400 .The research have indicated that the livestock is the common physical capital for many households in the area. Livestock plays a significant role in the rural economy .They provide draft power, manure, transport and various products such as meat, milk and eggs .This is supported by research done by Mutenje et al (2008) that have postulated that in most rural areas of most developing countries where formal insurance and credit markets are missing livestock and their product can be easily liquidated to provide financial resources during times of shocks.

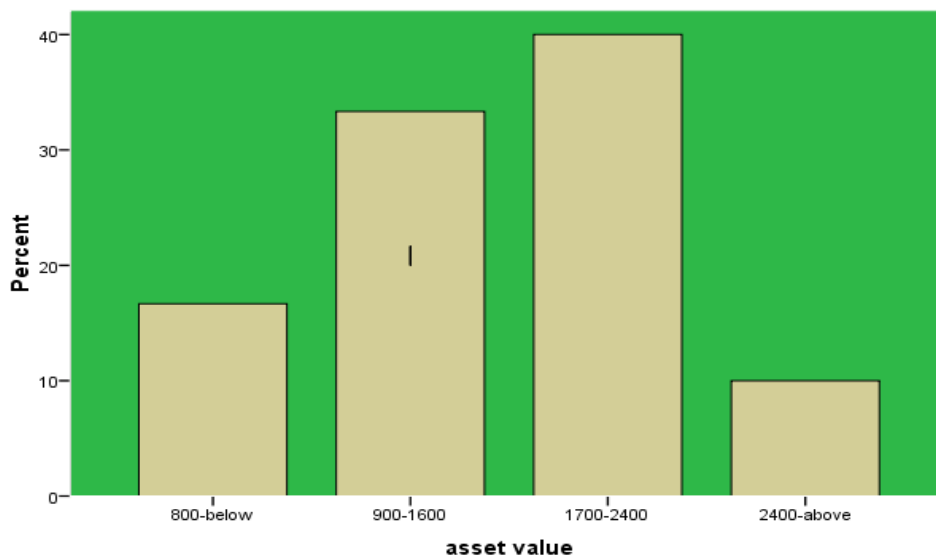


Figure 4.5 showing asset values of respondents

4.3: Extraction and Utilization of *Ziziphas mauritiana* NTFPs

Figure 4.1 shows that sampled households extract *Ziziphas mauritiana* products such as fruits pulp, roots, bark and leaves from nearby forest and they have considerable importance to their livelihoods as shown in Figure 4.7 below

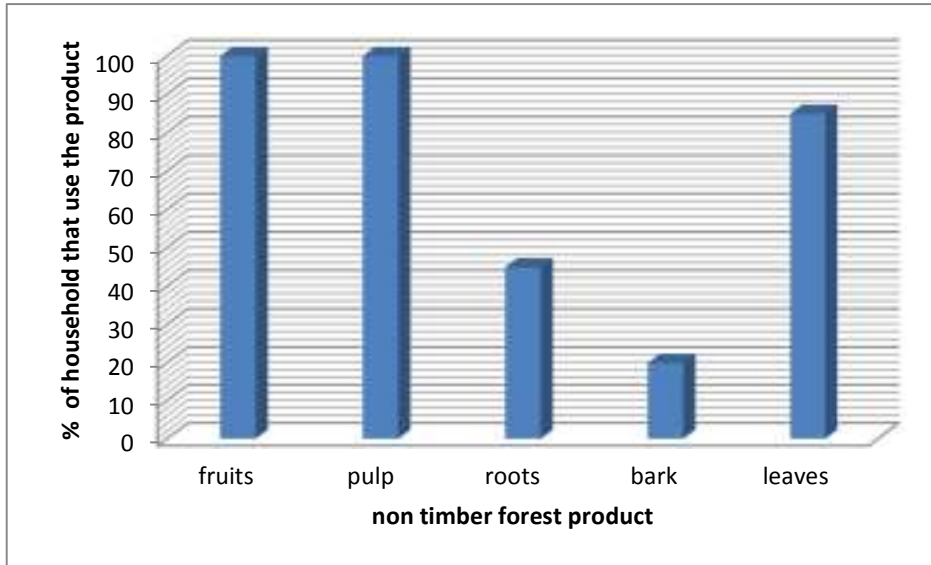


Figure 4.6 Types of NTFPs extracted and use

The survey indicated that more than 90% of the sampled households reported that they harvested *Ziziphus mauritiana* fruits from the forest. This is attributed to increase in frequency of intermittent drought, decline in agriculture productivity and global cotton price resulting in most average cotton producing household sliding into deep poverty. The research revealed that fruits were mainly extracted for food and income generation in the area. The fruits are mainly eaten raw, dried and pounded to make pulp that is used for various purposes. The pulp is mainly used to make beer, juice, jam and generate income.

4.3.1 Ziziphas leaves extraction and use

Figure 4.1 results revealed that more than 80% of respondents in the area extract *Ziziphus mauritiana* leaves for fodder to feed livestock. The leaves are mainly harvested during the dry periods as they will be potential source of pasture. Due to highest population of animals in the area the method that are used to harvest these leaves are not sustainable to the environment as this degrade the environment.

4.4 Common products processed from Ziziphas mauritiana fruits and their uses

Common products processed from *Ziziphas mauritiana* fruits and other products. Chimunda and Chingawo communities use the highest proportion raw fruits. The

survey revealed that the highest proportion of fresh fruits is used for immediate consumption. Rukodzo consumed 55% which is the highest among the sampled villages.

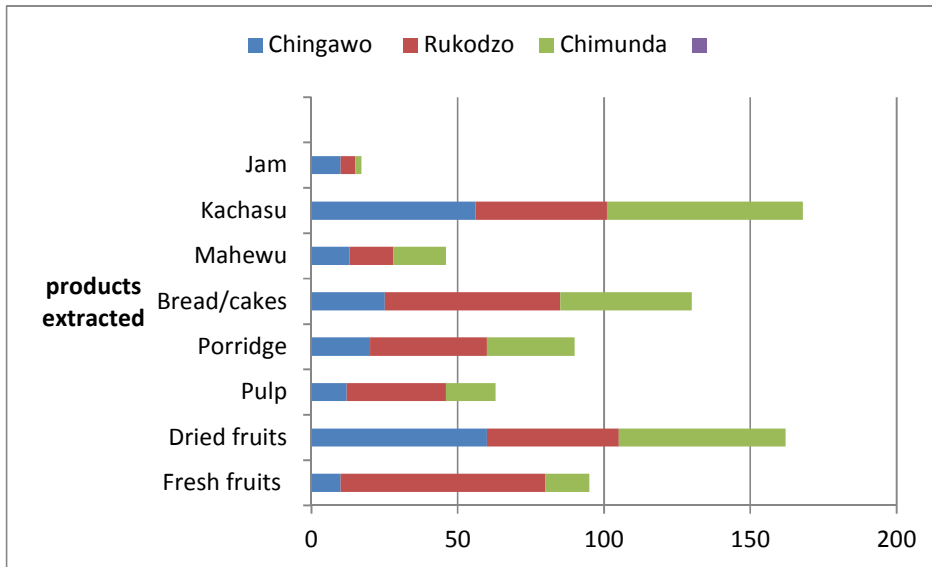


Figure 4.7 Common NTFPs extracted per each village

The focused group discussion revealed that *Ziziphas mauritiana* fruits also dried and they are eaten as snacks to reduce hunger during periods of dry season. Some of the dried fruits are sold for income generation. According to Obedode (2005), these dried fruits are also consumed during the lean period particularly during the beginning the rainy season. The pulp is used for various purposes that include porridge. The porridge is produced by mixing pulp with small amounts of mealie meal. This is common in times of food shortages. Photograph 2 below shows pulp being prepared for different uses in Mukumbura ward 2.



Photograph 2 Pulp prepared for different uses such as Mahewu making(*Source field data 2012*)

The sampled households also revealed that the fruits can also be processed to produce juices, beer and local drink commonly known as *Mahewu*. The drinks are made through mixing pulp with either fresh or dried fruits with mealie meal and water and left for a day in order to allow fermentation and sugar can be added. Beer selling is very popular in Chimunda and Chingawo villages because they are close to Mozambique and Mukumbura business centre. Thus beer acts as a source of income contributing significantly to poverty alleviation. Photograph 2 below shows a woman in Mukumbura distilling Kachasu.



Photograph 3 Women distilling *Kachasu* in Mukumbura ward 2 (Source field data)

Respondents extract juice from *Ziziphus mauritiana* fruit to make jam, the local people get help from Tulimara Speciality foods for Africa through training on ways of making jam using the pulp. The jam that is rich in vitamin c and a shelf life of two years is then sold to supermarkets and to local customers. The sampled households also reported that they benefited economically from cash obtained from selling *Ziziphus mauritiana* fruits and value added products such as jam shown below on, (Photograph 3).



Photograph 4 Jam made from *Ziziphus mauritiana* (Source Field data 2012)

4.4.1 Quantities of NTFPS harvested annually per household head

The research also revealed that type of household head plays a major role in the amount of NTFPs that can be extracted as shown by Figure 4.7 below. The study has shown that those who are married and widowed extract products in large quantities reaching up to above 600 kilograms of *Ziziphus mauritiana* per year. Large harvest were as a result of family demand thus those with large families had to seek for alternative in forest to fend for the family. This shows limited sources of livelihoods in the marginalized areas. The results tally with findings of CIFOR (2004) in South Africa that most of the group members involved in extraction of NTFPs in large quantities were woman either married, widowed and divorced as they had to provide for their families, (CIFOR, 2004). The Figure 4.7 below shows quantities of NTFPs harvested annually per household head.

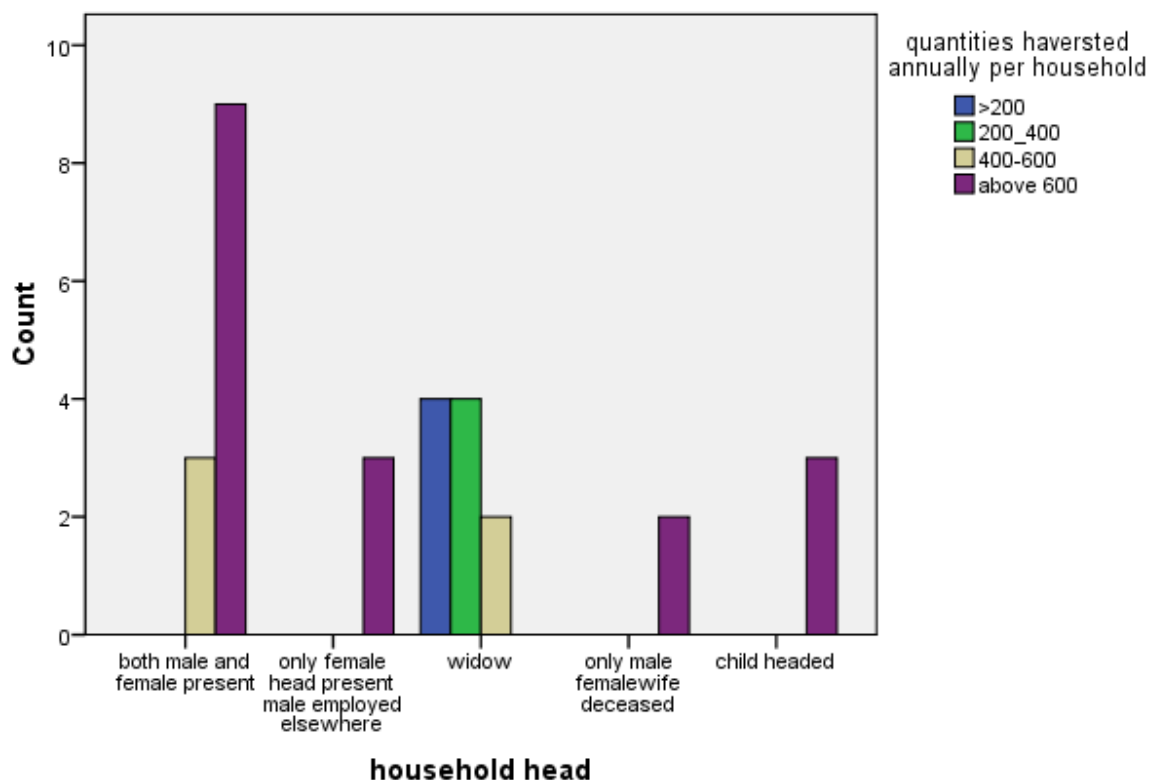


Figure 4.8Quantities of NTFPS harvested annually per household head

4.5 Challenges of sustainable utilization of NTFPs in the study area

The research has revealed that sustainable utilization of NTFPs in Mukumbura ward 2 is affected by ecological factors (16.15%) such as decrease in the seedling of the species and deforestation of trees for energy purpose in the area that have caused a decrease in population of *Ziziphas mauritiana* plant species. This seems to tally with studies done by Mupendembe (2004) that extraction of NTFPs have affected the conservation of ecosystems. The study have also revealed that marketing and economic factor such as poor infrastructures such as poor roads have hindered the sustainable utilization of NTFPs in Mukumbura by (48.40%). Social factors such as lack of proper social networks to improve the marketing of NTFPs in Mukumbura ward 2 by 38.39% this tally with

studies done by Mutenje et al (2011) ,which stated that social organization have a bearing on improvement of marketing of NTFPs in southern parts of Zimbabwe.

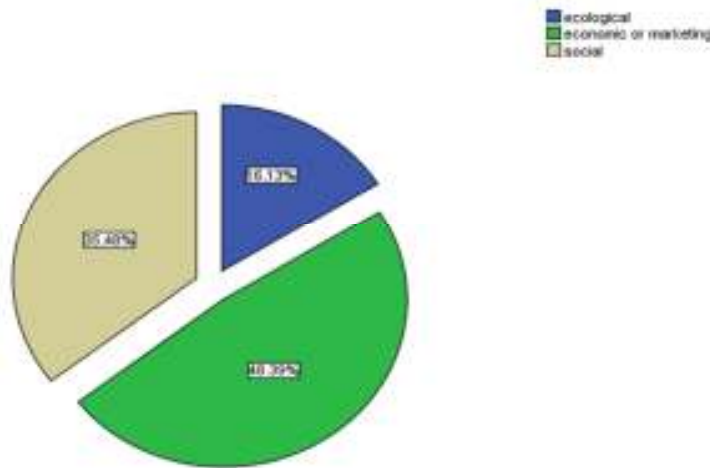


Figure 4.9 showing factors challenges of utilization of NTFPs in Mukumbura ward 2

4.6 Income sources

In order to understand the contribution of NTFPS to rural household income, all sources of household income were listed and the composition calculated (Figure 4.8). For all the households that were sampled 52 % reported that they earn income from NTFPs. Income from NTFPs is earned through various means that include fruit sales and beer selling. It can be deduced from the results that NTFPs have a potential of raising household income for rural people. Results from Figure 4.8 shows that people in the study area rely on livestock selling as a main source of income because its livestock region. Livestock selling contributes 62 % of income.

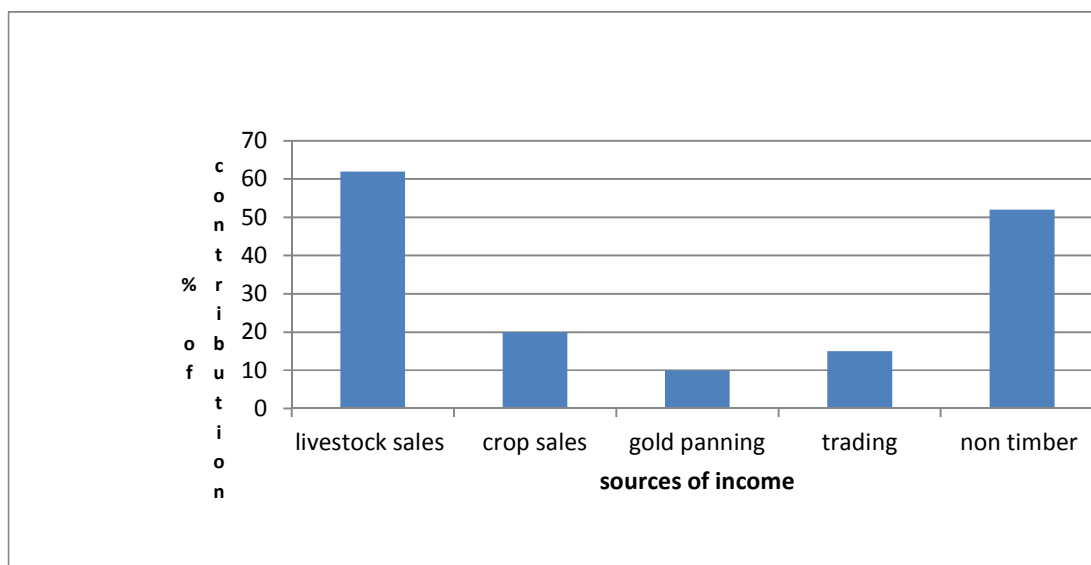


Figure 4.10 Sources of income and their contribution to household income

4.6.1 Uses of income

Survey results on Figure 4.9 indicate that *Ziziphas mauritiana* NTFPs sales offer a substantial amount of income. The area has limited sources of income such as remittances and rural employment opportunities especially when agriculture production fails and during economic shocks. Figure 4.9 shows that most respondents in the study used their accrued income for various purposes.

The cash earned from NTFPs was important for household expenses such as buying groceries, day to day expenses, school fees, buying agricultural inputs and funeral expenses. Although the share of household income from fruit sales is low, it is often useful in filling seasonal gaps or other cash flow gaps. Research have revealed that household income from NTFPs play an important role in reducing rural household vulnerability to shocks such as droughts, diseases and economic shocks like inflation. Research that have been carried out in other countries have revealed that sale of wild fruits in Tanzania villages contributed to 58% of t of farmers cash income, (Monela, 2000 in Mapendembe, 2004) which means income accrued from use of forest products are important to rural livelihoods and poverty alleviation in rural communities. Figure 3 shows uses of income generated from sale of forest product.

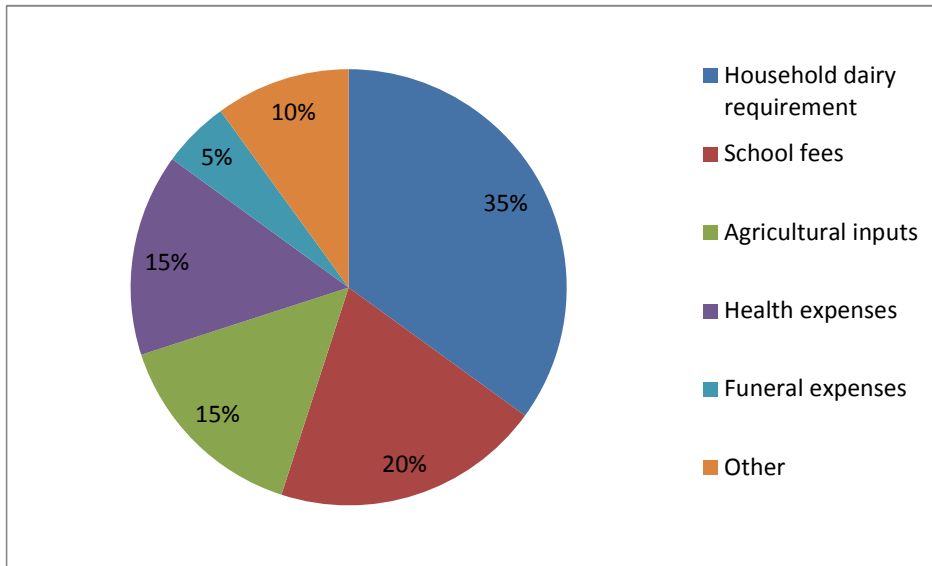


Figure 4.11 showing different uses of income from sale of NTFPS

4.7 Conclusion

The results showed that *Ziziphus mauritiana* fruits play an important role in the poverty alleviation of the rural communities in Zimbabwe. The fruit is consumed fresh and also sold at local markets. Dried fruits can be transformed into various products such as porridge, traditional cake and *Mahewu*.

CHAPTER V: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter highlights major findings of the study and their implication on the livelihoods of people of Mukumbura. It presents the summary on how the *Ziziphas mauritiana* products were used to meet the demands of the community. It also provides recommendations to improve the exploitation of natural resource in Zimbabwe for the benefit of the communities involved in an effort to improve their living standards, dietary requirements, nutritional security and to reduce poverty .

5.2 Summary

The major thrust of the study was to identify the major NTFPs extracted from *Ziziphas mauritiana* tree by the local people of Mukumbura ward 2 to supplement shrinking sources of food and income and how that increases value on their wellbeing. The objective of this study was centered on finding the socio economic benefits that local people derive from the use of NTFPs from *Ziziphas mauritiana* and to evaluate the contribution of *Ziziphas mauritiana* products to household food security, income and overall wellbeing of the local community. These were used to determine if people in the local area extract *Ziziphas mauritiana* products during times of shocks. Questionnaires were used to collect data from sampled households, interviews were used to collect data from the key informants and focused group discussion was used to complement data from questionnaires and interviews. The secondary data were found from different journals. The SPSS software was used to analyze data and to find the relationship that existed between socio economic factors and type of products extracted as well as use of the products in different households. The research aimed to find out if *Ziziphas mauritiana* products can act as a fall back to main livelihood strategies in the societies during period of climatic and economic shocks. These test enabled the researcher to arrive at these conclusions which are as follows.

5.2.1 Extraction and use of *Ziziphas mauritiana* in ward 2 of Mukumbura community

The sampled households heads and key informants revealed that *Ziziphas mauritiana* fruits and pulp mainly extracted in the area for they provide essential needs of the people. The fruits are mainly extracted during the pick of the dry season, they are seasonal. The fruits are eaten fresh and the surplus is either dried for other uses such as to produce pulp. The surplus fruit is also eaten as snacks during times of hunger. The pulp is used to make juices such as *Mahewu*, for porridge. The fresh or dried fruit are also used to brew beer called *kachashu* in the area

Both the poor and the rich participate in the extraction of *Ziziphas mauritiana* products. Variations were observed on the type, quantities and uses of the products. The young, rich and educated concentrate on the commercializing value added products such as *Ziziphas mauritiana* juice and beer which attracted ah high income. The poor fail to value add hence more products are used and marketed raw materials such as fruits and pulp attract low prices. The *Ziziphas mauritiana* leaves are used to supplement fodder and chemical fertilizers. Fruit sales and beer selling supplement shortfalls in area such as food and income since they are used by the majority of the respondents in the area. The test carried out indicated that use of *Ziziphas mauritiana* had no relationship to the social characteristics of the people hence all groups in the area had the opportunity to extract the resource in times of need.

5.2.3 Potential of *Ziziphas mauritiana* to Contribution to Household Food security and Income

Gathering and use of *Ziziphas mauritiana* fruits proved to be of much important in lives of people since it provides as source of food and generate income to the people of the study area. These results showed that the benefits from commercialization indigenious *Ziziphas mauritiana* fruits were potentially significant in terms of improving the wellbeing of the local community. It is evident that related enterprises such as beer brewing and marketing provided as source of employment, income driven from these enterprises provided for the basic household needs of food, clothing, healthy, agricultural inputs and education for their children. *Ziziphas mauritiana* related activities contributed

52% of the household income annually to those involved in *Ziziphas mauritiana* enterprises, (Figure 4.8) which means it can act as a safety net to poverty alleviation. Income generated from these activities is treated as wind fall to supplement main livelihood strategies. The research clearly highlighted the ability of *Ziziphas mauritiana* activities in improving household food security and income as well as wellbeing thus reducing poverty in rural areas.

The results revealed that even though households in Mukumbura ward 2 have potential of benefiting from NTFPs in the area their facing many challenges. These challenges ranges from marketing among them include poor infrastructure such as roads that is preventing them have access to urban markets. Social impacts such as lack of social organization to form group that will reduce cost of marketing and increase bargening power is affecting sustainable utilisatin of the NTFPs.

The results of the research proved that *Ziziphas mauritiana* tree products were numerous and local people benefited from the use in times of food shortages and as a form of livelihood strategy. The present of these products in drought stricken areas would help in provision of food and also become a means of survival to the marginalized poor rural areas with no access to other forms of livelihoods that improve the flow of cash flow of the society.

5.3 Recommendations

The following recommendations have been suggested to enhance the use of *Ziziphas mauritiana* NTFP as they contribute to socio economic benefits to rural communities in Mukumbura.

- ❖ From Figure 4.9, it is indicated that NTFPs contribute 52% of total household income, therefore it is crucial that both rural development strategies and forest management policies take into account the central role of NTFPs in the livelihoods of rural poor, because economic vulnerability poor households are force to alternate to NTFPs extract.
- ❖ In the view above conclusion, the study on the value addition such as homemade juice such as *mahewu* and beer, (Kachasu). The level of benefit depend on the

value addition that they undertake on the product. Beer brewing was done at a subsistence level such that if proper technologies were devised, villages would fetch high prices.

- ❖ NTFPs contribute to substantially household income as shown by Figure (4.8) and if these are flanked by appropriate intervention, these products could contribute even more household income.
- ❖ Rural communities need to put more emphasis on the local markets which proved to be more reliable than seasonal mobile traders. Export trade on natural products proved to be lucrative but it requires heavy capital investment and large product volumes. Local markets are also easier to penetrate and monitor than foreign markets.

5.4 Conclusion

Mukumbura ward 2 is characterized by abundance of *Ziziphus mauritiana* tree species with much untapped wealth. There was enough evidence from the research that *Ziziphus mauritiana* products have the potential to improve food security and income of households during periods of food shortages during drought, provide income during times of experiencing low crop production and to unemployment. The *Ziziphus mauritiana* has many products such as fruit, leaves, bark and pulp which have the potential of improving household food security, income and wellbeing thus help to reduce poverty. The statistical test prove that there is no relationship between use and social characteristics of people in the area hence members could benefit from the use of the resources to meet family needs.

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Appendix 1

Questioner on the contribution of Non-Timber Forestry Products [NTFPs] to Poverty Alleviation Strategy in Mukumbura Ward 2

MUTENJE STEWART [b0924460]

I am a undergraduate student from Bindura University of science education studying Development studies .The questionnaire Guide is designed to collect the information on “The contribution of Non-Timber Forest Products (NTFPs) from *Masau, (Ziziphas Mauritania)* household income ,food security and welfare.The research helps to identify potential social economic contribution of products from *masau* to poverty alleviation.The collected information can be used by organization to establish project in the area.The collected information is treated confidential and will be used for only the purpose of academic study.

| | |
|-------------------------|---------|
| Place of interview..... | Date of |
| interview..... | |
| Interview No..... | |

SECTION A: HOUSEHOLD DEMOGRAPHY

1. Who is the head of household?

1Both male and female present, (2) only female head present male employed elsewhere, (3) only female male deceased (4) only male female employed elsewhere (5) only male present wife deceased (6) child headed (7) other (specify).....

2 Table on household demography

| Name | Relationship with household head (3a) | Marital Status (3b) | Sex 1=male 2=female | Age(yrs) | Level of education | Occupation | Religion | Professional training |
|------|---------------------------------------|---------------------|---------------------------|----------|--------------------|------------|----------|-----------------------|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

3[a] –[1] father [2]mother [3]son [4] daughter [5]daughter in law [6]son in law [7]other specify

[b] -1[single [2] married [3] windowed [4] divorced

SECTION B HOUSEHOLD ENDOWMENTS

3 .What type of housing do you have?

I] Burt bricks iron/asbestos roofed

II] pole and dagga and thatched

III] Burnt bricks, thatched roofed

IV] other

specify.....

4 CROP PRODUCTIONS ON THE FARM

Which crops were grown on the farm in 2010/11 and what area was grown to each?

| Crop grown | 2010 | 2011 |
|------------|------|------|
| Maize | | |

| | | |
|---------------|--|--|
| Millet | | |
| Cotton | | |
| Sorghum | | |
| Other specify | | |

5 LIVESTOCK OWNERSHIP

| Type of livestock owned | Number owned | How many did you acquire in last four years | How many did you sell in last four years |
|-------------------------|--------------|---|--|
| Bulls | | | |
| Oxen | | | |
| Cows | | | |
| Steers | | | |
| Heifers | | | |
| Calves | | | |
| Sheep | | | |
| Goats | | | |
| Chickens | | | |
| Pigs | | | |
| Other specify | | | |

6 PHYSICAL ASSESTS OWNED

| ASSETS | How many implements in working condition | Age |
|-----------------|--|-----|
| Ox-drawn plough | | |
| Cultivator | | |
| Harrow | | |

| | | |
|---------------------------------|--|--|
| Planter | | |
| Ripper | | |
| <u>Ridge</u> | | |
| Wheel barrow | | |
| Scotch cart | | |
| <u>House hold assets</u> | | |
| Radio | | |
| Television | | |
| Tables | | |
| Chairs | | |
| Sewing machine | | |
| Bicycle | | |
| Car | | |
| Other (specify) | | |
| | | |
| | | |

7 Income sources

What are your major sources of income? 2010/2011 Rank according to their reliability as income source, where one [1] is the most reliable source

| Source of income | Amount | Uses of income | Reliability |
|------------------|--------|----------------|-------------|
| Crops sales | | | |
| Livestock sales | | | |
| Gardening | | | |
| Off farm | | | |
| Beer brewing | | | |
| Remittances | | | |
| Fruit sales | | | |
| Other [specify] | | | |

Uses code 1=household dairy requirements, 2=school fees, 3=clothing, 4=Agricultural inputs, 5=health expenses, 6 =other specify

8 Uses of Masau Non timber forest products

8.1 What purpose do you use the extracted *Masau*Product?

| Product | Medicine | Food | Income generation | Other [specify] |
|---------|----------|------|-------------------|-----------------|
| Roots | | | | |
| Leaves | | | | |
| Fruits | | | | |
| Fibres | | | | |
| Bark | | | | |
| Other | | | | |

8.2 How often do you harvest *masau* product?

Weekly Monthly Daily
 Peak season

8.3 what quantities of *masau* fruits could you haverst annually

1-5bags 5-10bags 10 bags

9 What was the most important use to which the income from NTFPs put? Rank your uses in order of importance , where one [1] represents the most important [5] the least

| Use | Rank |
|------------------------------|------|
| Household Dairy requirements | |
| School fees | |
| Agricultural inputs | |
| Health expenses | |
| Funeral expenses | |
| Other [specify] | |

10 .what challenges are you facing to full utilize the NTFPs in the area

.....
.....
.....
.....
.....
.....

THANK YOU

APPENDIX 2

Traders Interview Guide

BINDURA UNIVERSITY OF SCIENCE EDUCATION

GEOGRAPHY DEPARTMENT

INTERVIEW GUIDE FOR TRADERS

MUTENJE STEWART [B0924460]

I am a undergraduate student from Bindura University of science education studying Development studies .The questionnaire Guide is designed to collect the information on “The contribution of Non-Timber Forest Products (NTFPs) from *Masau(Mauritania)* to household income, food security and wellbeing .The research helps to identify potential social economic contribution of products from *masau* to poverty alleviation e .The collected information can be used by organization to establish project in the area .The collected information is treated confidential and will be used for only the purpose of academic study.

| | |
|-------------------------|---------|
| Place of interview..... | Date of |
| interview..... | |
| Interview No..... | |

1. 0 Interview Guide

1.1 Position of the respondent.....

1.2What masau products do you mainly extract from the communities around?

1.3According to your records ,which social classes sell baobab products to your organization?.....

.....

1.4 What is your catchment area for masau products?

.....

1.5 How many bags of masau fruits did you buy as from 2001 from communities around

| 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|------|------|------|------|------|------|------|------|------|------|
| | | | | | | | | | |

1.6 In what form do you buy these masau products ?

.....

1.7 What is the current price of 50kg masau fruits in United States dollar

1.8 Do you further process these products for international market?

.....

1.9 If yes to 1.8 above explain what products are obtained from masau products?

.....

.....

1.10 What problems do you face when trading the masau products?

.....

1.11 Do you seek permits to buy masau products in the area? Yes no

1.12 If yes how much are you paying

1.13 Since you have started your business ,are there any changes in the supply of masau products

Yes no

1.14 If yes state the changes.....

1.15 Do you have special arrangements with traders ?yes no

1.16 If yes who.....

1.17 Are you satisfied with the current use of masau products in the area?

YES NO

1.18 If no explain what should be done to ensure sustainable use is achieved?

.....
.....
.....
.....
.....
.....
.....
.....

Thank you

Appendix 3

BINDURA UNIVERSITY OF SCIENCE EDUCATION

GEOGRAPHY DEPARTMENT

INTERVIEW GUIDE FOR TRADERS

MUTENJE STEWART [b0924460]

I am a undergraduate student from Bindura University of science education studying Development studies .The questionnaire Guide is designed to collect the information on “The contribution of Non Timber Forest Products (NTFPs) from *Masau (Ziziphas Mauritania)* to poverty alleviation .The research helps to identify potential social economic contribution of products from *masau* to poverty alleviation e .The collected information can be used by organization to establish project in the area .The collected information is treated confidential and will be used for only the purpose of academic study.

| | |
|-------------------------|------------------------|
| Place of interview..... | Date of interview..... |
| Interview No..... | |

1.0 Interview Guide

1.1 Position of the respondent.....

1.2What masau products do you mainly extract from the communities around?.....

1.3According to your records , which social classes sell *Ziziphas mauritiana* products to your organization?.....

1.4 What is you catchment area for *masau* products?
.....

1.5 How many bags of *masau* fruits did you buy as from 2001 from communities around

| 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|------|------|------|------|------|------|------|------|------|------|
| | | | | | | | | | |

1.6 In what form do you buy these masau products ?

.....

1.7 What is the current price of 50kg *masau* fruits in United States dollar

1.8 Do you further process these products for international market?

1.9 If yes to 1.8 above explain what products are obtained from masau products?

.....

1.10 What problems do you face when trading the masau products?

.....

1.11 Do you seek permits to buy masau products in the area? Yes no

1.12 if yes how much are you

paying?.....

1.13 Since you have started your business, are there any changes in the supply of masau products

Yes

no

1.14 If yes state the changes.....

1.15 Do you have special arrangements with traders ? yes

no

1.16 If yes who.....

1.17 Are you satisfied with the current use of masau products in the area?

YES

NO

1.18 If no explain what should be done to ensure sustainable use is achieved?

.....
.....
.....
.....
.....

Thank you

APPENDIX 4

Focused Group Discussion Guide

- 1 Type of product extracted
- 2 Quantities extracted
- 3 Age mainly extracting products
- 4 Sex of harvesters
- 5 Methods of Harvesting
- 6 Occupation of harvesters
- 7 Trade practiced on Masau products
- 8 Crops grown in the area
- 9 Animal kept in the area
- 10 Uses of cash accrued from commercialization of Masau
- 11 Marketing strategies for Masau product
- 12 Manufactured products from masau

