WILDLIFE RESOURCE UTILISATION AND RURAL LIVELIHOODS IN MUKUNGULE GAME MANAGEMENT AREA, MPIKA, ZAMBIA

BY

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LUSAKA

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This dissertation by Maria Sakala is approved as fulfilling the partial requirements for the award of the degree of Master of Science in Environmental and Natural Resources Management by the University of Zambia.

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ABSTRACT

Wildlife utilisation for livelihoods frequently conflicts with conservation, raising challenges of integrating rural livelihood issues into conservation agendas.

However, the reality of wildlife utilisation in rural areas, especially Game Management Areas cannot be stated simply; it is a multifaceted problem linked to poverty, infrastructure underdevelopment, people's traditions and perceptions, and sometimes the political atmosphere exemplified in government's formulation and implementation of GMA policy.

This study aimed at investigating how wildlife utilisation and rural livelihood activities affect conservation. The objectives of the study included the identification of the drivers of wildlife utilisation in Mukungule Game Management Area in northern Zambia; exploring the effects of rural livelihoods activities on wildlife conservation; and assessing the impacts of wildlife management policy on rural livelihoods. As such, the questions driving this study were: What are the drivers of bush meat utilisation? How can rural livelihood activities affect wildlife conservation? How do wildlife management policies affect access to livelihood resources for rural communities? Semi-structured and structured interviews were conducted throughout Mukungule Game Management Area to generally explore the links between wildlife conservation and rural livelihoods.

Drivers of bush meat utilisation that were identified included income, protein needs, culture, human-wildlife conflict, lack of knowledge and poor governance. The activities that affected wildlife conservation in Mukungule Game Management Area were activities that mostly utilised natural resources, such as poaching, bush burning, charcoal production and *chitemene* system of farming. When the impacts of wildlife management policies on rural livelihoods were assessed, it was noted that the impact was related to problems about the equitable sharing of benefits of wildlife conservation.

The study also showed that conservation programmes often do not compromise local livelihoods and most people can usually access required livelihood resources. However, even if Mukungule Game Management Area residents are aware of practices which are detrimental to wildlife conservation (such as illegal hunting and bush burning), wildlife utilisation becomes an alternative livelihood activity when primary livelihood activities fail. Eventually, their 'traditional' activities like hunting conflict with conservation goals. The study concludes that persistent low diversity in livelihood options intensifies utilisation of wildlife resources, highlighting the vulnerability of rural households as well as the need for viable alternatives in times when primary livelihoods are under stress. It was also noted that rural livelihoods are connected to poverty and development and the political structures in rural areas.

Finally, the study recommends the need to develop localised conservation programmes because it helps people to identify with conservation efforts, thereby reducing negative responses to conservation. Therefore, this study is significant because it contributes to a better understanding of wildlife utilisation by rural communities and the value they place on conservation of wildlife. The study is also important because it can help the government in reviewing game management policies to enhance wildlife conservation, and can help non-governmental conservation organisations to formulate programmes aimed at reducing people's reliance on unsustainable harvesting of wildlife resources.

DEDICATION

To my parents, Aidon and Besia Sakala from whom I have learnt that *Aquila non capit muscas*: an eagle does not catch flies.

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ACRONYMS

ADMADE: Administrative Management Design for Game Management Areas

CAs: Controlled Areas

CBD: Convention on Biodiversity

CBNRM: Community Based Natural Resources Management

CHAs: Controlled Hunting Areas

CRB: Community Resource Board

EA: Ecosystem Approach

GMA: Game Management Area

HMLGs: Homemade Muzzle Loading Guns

HSGs: Homemade Shotguns

HWC: Human Wildlife Conflict

IUCN: International Union for Conservation of Nature

LIRDP: Luangwa Integrated Resource Development Project

MGMA: Mukungule Game Management Area

NGOs: Non-Governmental Organisations

NLNP: North Luangwa National Park

NP: National Park

VAG: Village Action Group

ZAWA: Zambia Wildlife Authority

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Wildlife resources are a wide range of indigenous or naturalised non-livestock species from a variety of habitats. The sustainability of wildlife resource utilisation depends on production potential as well as its social and economic use that does not affect the conservation process (Robinson and Bennett, 2004). Wildlife utilisation, as defined by Richardson (1998:1) is "making economic and social use of wildlife resources." Kamwengo (1999) observed that from pre-colonial time in Zambia utilisation of wild resources was a means of balancing people's livelihoods. Presently, wildlife is hunted not only to supplement protein for both rural and urban poor but also for income and sustaining livelihoods. The term livelihood refers to resources and activities required to make a living (Mfune, 2012). Resources that people draw on to sustain themselves are a combination of natural, economic, human and social capital while livelihood strategies are activities that people employ to maximize their benefits from resources (Hussein and Nelson, 1998).

According to Scoones (1998: 5), a livelihood is sustainable if it "can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base." It should be noted that unsustainable utilisation of wildlife resources may affect conservation of wildlife. Conservation is a process of ensuring utilisation of wildlife resources is sustainable. That is, wildlife resources should be utilised in "a way and at a rate that does not lead to the decline of wildlife in the long-run so as to maintain its potential to meet the needs and aspirations of present and future generations" (CBD, 1992: 4). In this way, sustainable utilisation should address both extractive and non-extractive use of

wildlife: even use of wildlife can provide incentives for conservation as long as such usage is managed to achieve sustainability (Hutton and Leader-Williams, 2003). Furthermore, such management should consider subsistence farmers who coexist with wildlife and sometimes have an inaccurate understanding of their rights to natural resources (Child et al., 2012).

Wildlife utilisation can be both consumptive (hunting) and non-consumptive (viewing and photographing). In this study, legal wildlife utilisation will be referred to as game meat while illegal wildlife utilisation will be referred to as bush meat. Although the illegality of bush meat production largely concerns large animals (mega-fauna), bush meat from smaller fauna such as rodents, birds and insects can also be an important source of protein (TRAFFIC, 1998). The utilisation of mini-fauna is extensive and often conducted openly due to the perception by many rural people that use of such species is legal (TRAFFIC, 1998).

Some of the reasons for hunting wildlife (legally or illegally) include adventure, culture or heritage, spiritual reasons and the need for wildlife meat products (Bennett, 2002). Other factors underlying bush meat trade include "poverty and food insecurity; and inadequate legal frameworks that enable communities to benefit legally from wildlife and that create incentives for people to stop illegal bush meat hunting" (Lindsey et al., 2013: 81). This is corroborated by Loibooki et al. (2002: 391) who wrote that "People with access to alternative means of generating income or acquiring protein were also less likely to be involved in illegal hunting." But the case for poverty as a driver is limited because in some instances, the poor cannot afford the tools for hunting wildlife and are also too poor to afford the bush meat, which usually ends up in markets outside their communities (de Merode et al., 2004).

Of the factors that may drive rural communities to kill wild animals illegally, non-involvement of local people in formulating game management policies may be the reason because it makes people undervalue wildlife conservation (Udelhoven, 2006). This is in line with Hutton and Leader-Williams (2003) who argue that incentive-driven conservation should be at the centre of the conservation process. However, community involvement in conservation should not encourage use and dependence on wildlife resources because the priority should be on protecting wildlife against exploitation (Nielsen, 2006). Although communities should never be excluded from the conservation process, the success of their involvement depends on managing the role communities play in finding solutions that would benefit them as well as the conservation process (Holmes, 2013).

Formal protection of wildlife in Zambia commenced with the establishment of the first National Park (Kafue National Park) in 1950 under the 1943 Game Ordinance which also declared some areas as Controlled Areas (CAs). The CAs were reclassified in 1954 as Controlled Hunting Areas (CHAs) to allow for controlled hunting. In 1971, under the National Parks and Wildlife Act, all CHAs were converted to Game Management Areas (GMAs) (Simasiku et al., 2008).

The rationale behind creating GMAs was that they were to operate as buffer zones between National Parks (NPs) and major human settlements. GMA policy also aims to combine conservation with economic empowerment of rural people (Zulu, 2009). This followed the realization that legal wildlife harvest rights are mostly dominated by people outside GMAs who do not bear the negative impacts of wildlife conservation (Matzke and Nabane, 1996). In this sense, wildlife management policy views people in GMAs as a means rather than an obstacle to conservation, thereby encouraging local people to look after mega-fauna. However, the fact that human

settlements were allowed to continue existing in GMAs meant that human interaction with wildlife would continue which may lead to HWCs; humans may hunt and kill animals for sustenance or animals may attack humans and their crops, which may affect the livelihood of people in GMAs. Thus, the basic link between GMAs and rural livelihoods is that a GMA is land that is accessible to local people and on which local people draw different resources to sustain their livelihoods. This is frequently a major problem for conservation because when wildlife and people share the same lands and resources, or exist in close proximity, HWCs are likely to occur. As for utilisation, Hackel (1999) argues that the fact that indigenous people depend on their environment for survival implies they know natural resources are important for their household livelihoods. Bush meat may sustain communities in times of economic shock, both as a source of protein and income; however, this is usually only over the short-term because as shocks vary or increase, utilisation of bush meat becomes ineffective as a buffer (Brashares et al., 2004; Kalaba et al., 2013).

However, although successful wildlife conservation may positively impact on rural livelihood by increasing tourism activities and private sector investment which leads to greater revenue for communities, it may also increase crop damage by wildlife, tsetse infestation, and other HWCs. This is pointed out by Fernandez et al. (2009a) who argue that successful GMA protection of wildlife populations and diversity not only increases HWCs but also threatens the sustainability of conservation activities as also noted by Carpaneto and Fusari (2000).

1.2 STATEMENT OF THE PROBLEM

Compatibility of wildlife conservation and sustainable utilisation of wildlife resources for rural livelihood depends on the integration of rural livelihood strategies in conservation agendas or policies. Consideration of rural livelihood is important because although GMA management policy recognises the importance of involving local people in managing wildlife in GMAs, poverty and demand for wildlife resources may render the integration process difficult. Thus, the probability of local people falling back on their traditional means of survival, such as hunting, consuming and selling wildlife, can increase because people may regard conservation as less beneficial to their livelihoods. The problem therefore, is that persistence of wildlife utilisation for livelihoods in GMAs affects conservation of wildlife. This poses a challenge for the successful conservation of wildlife which needs to be a viable land use option for rural communities opting to use wildlife in order to sustain their livelihoods. Furthermore, the link between rural livelihood and wildlife resource utilisation in Zambia is poorly understood, not well assessed and not well documented. This necessitated the current study of wildlife resource utilization and livelihoods in Mukungule GMA.

1.3 AIM

The aim of this study is to investigate how wildlife-based livelihoods affect conservation.

1.4 OBJECTIVES

    i. To identify the drivers of bush meat utilisation in Mukungule Game Management Area.

    ii. To examine how rural livelihoods activities affect wildlife conservation

    iii. To assess the impacts of wildlife management policies on rural livelihoods.

1.5 RESEARCH QUESTIONS

The questions driving this study are:

i.   What are the drivers of bush meat utilisation?

ii.   How can rural livelihood activities affect wildlife conservation?

iii.   How do wildlife management policies affect access to livelihood resources for rural communities?

1.6 HYPOTHESES

1. H_1. There is a significant relationship between wildlife utilisation and conservation in Mukungule GMA.

H_0. There is no significant relationship between wildlife utilisation and conservation in Mukungule GMA.

2. H_1. There is a significant relationship between conservation and rural livelihood in Mukungule GMA.

H_0. There is no significant relationship between conservation and rural livelihood in Mukungule GMA.

1.7 SIGNIFICANCE OF THE STUDY

This study is significant because it will contribute to a better understanding of wildlife utilisation by rural communities and the value they place on conservation of wildlife. The study is also important because it can help the government in reviewing game management policies to enhance wildlife conservation, and will inform non-governmental conservation organisations' programmes to reduce people's reliance on unsustainable harvesting of wildlife resources. Because a ban on bush meat utilisation is a shock to the rural economy, this study will add to the

existing literature and knowledge about rural livelihood survival strategies, resilience and sustainability.

1.8 ORGANISATION OF THE DISSERTATION

This dissertation is organised into six chapters. Chapter one is the introduction. It provides the background to this study, and outlines the aim and objectives, hypotheses, and significance of this study. Chapter two reviews relevant literature connected to the study while Chapter three describes the study area in terms of location and size of MGMA, its history, and its socio-economic and physical environment. Chapter four outlined the methods by discussing research instruments used, sources and types of data, sample size and sampling procedure and how data was analysed. Chapter five presents and discusses the drivers of bush meat utilisation, livelihood activities in MGMA and their connection to wildlife conservation, and the management of wildlife in MGMA. Chapter six concludes the study and provides recommendations for the balanced utilisation of wildlife and people's livelihoods, and areas for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 BUSH MEAT HUNTING IN MUKUNGULE GMA

Historically, the abundant and diverse wildlife resources of Zambia as well as other regions of Africa have been important in people's diets in rural areas, such that game meat has continued to be part of rural household economies (Bennett, 2002; Hutton and Leader-Williams, 2003). The hunting culture of the Bisa people and the social value of hunting have also been discussed in an anthropological study by Stuart A. Marks, in which he notes that the muzzle loading gun had replaced the spear by the 1960s and only people who still kept "alive the traditional mystique associated with their occupation" hunted (cited by Barnard, 1980). This is important to note because the improvement in hunting tools made the local hunter more effective and the increase in game kills more devastating for conservation.

Whether consumptive or non-consumptive utilisation of wildlife is legal or illegal, it affects conservation of wildlife. Nevertheless, it is the illegal or unregulated utilisation of wildlife that impacts the conservation process most adversely. It should be noted that changes in human settlements, population increase and technology have also modified the utilisation of wildlife. This is in line with Magome and Murombedzi (2003), who propose that indigenous hunting and gathering did not adversely affect big game populations, even when bush meat was an important part of local people's diet and wild products were important goods for exchange. However, with increasing human population and advancements in technology, greater demand for bush meat has often turned indigenous hunting into commercial poaching. These changes have accelerated the depletion of wildlife stocks and loss of biodiversity in many regions, which in turn affects the world's ecosystems

adversely. As such, the critical role of humans in conservation must be recognised and the importance of wildlife conservation should not be underestimated (Pope, 2005).

2.2 WILDLIFE UTILISATION AND CONSERVATION

One human activity which impacts negatively on wildlife is utilisation of wildlife because it can lead to depletion of wildlife populations if left unchecked (Averbeck et al., 2012). Thus wildlife utilisation can prove to be unsustainable and therefore unconstructive. In the same vein, although McNeely (1993: 144) noted that "people who depend on wildlife resources have developed means of managing these resources", this is not always applicable to hunting, especially illegal hunting, which can render key resources non-renewable or extinct and therefore unable to support the needs of society. On the other hand, in their study of bush meat hunting in the tropics, Robinson and Bennett (2004) concluded that the sustainability of hunting varied from one ecosystem type to another, and also depended on the nature and amount of human disturbance.

Although traditional subsistence hunting can contribute to the decline of wildlife, the major threat is posed by commercial poaching, which is usually highly organized and well-funded. What is clear about the problem of wildlife utilisation and conservation is that humans are part of both the problem and the solution. This is supported by Lewis and Alpert (1997) who argue that people who live in or around protected areas must receive some benefits from conservation that will offset the costs of their reduced access to wildlife products.

2.3 COSTS AND BENEFITS OF WILDLIFE CONSERVATION

GMAs in Zambia were supposed to constitute buffer zones between National Parks and human settlements, but many human settlements are within GMAs. Revenue-sharing systems have been instituted in many GMAs to provide local communities with proceeds from concession and trophy-hunting fees. This system is intended to give local people important economic benefits from conservation and also help in reducing illegal hunting of wildlife in their immediate vicinity (Wells and Brandon, 1993). The former Zambia Wildlife Authority (ZAWA), now the Department of National Parks and Wildlife, partners with local community organizations (notably Community Resource Boards) to share wildlife management responsibilities and revenue from hunting licenses. Households within GMAs are supposed to benefit from these arrangements through access to infrastructure development, employment and business opportunities, and revenue sharing. The logic is that local people should benefit because they typically bear 'the costs of conservation and living with wildlife'. Examples of such costs include people's inability to expand fields because they cannot protect many fields effectively and children's inability to go to school for fear of wildlife.

For example, people in GMAs may suffer negative impacts like crop destruction from increasing wildlife populations, or loss of human lives to wildlife (Gordon, 2009; Anthony et al., 2010; Goldman, 2011). In interviews with community leaders and residents of villages in GMAs, Fernandez et al. (2009a) found that human-elephant conflict was cited as the greatest development challenge among GMA households. ZAWA promotes the organization of Community Resource Boards (CRBs) to become partners in both wildlife protection and sharing license revenues from hunting and photographic safaris. This approach, known as Community Based

Natural Resource Management (CBNRM), aims at promoting the welfare of local communities and providing incentives for the protection and conservation of wildlife (Ellis and Allison, 2004; Fernandez et al., 2009b).

Conversely, Zulu (2009) and DeGeorges and Reilly (2009) have argued that CRBs and CBNRM have not always been successful, and thus people in GMAs have paid the price for conservation. This is not only because there have been human losses as well as failures by ZAWA to remit the benefits from wildlife to local communities, but also because of the negative effects of wildlife on service delivery in GMAs. For example, pupils in Chief Mwape's chiefdom found it difficult to go to school because they were afraid of wild animals, while teachers and other service-delivery workers found it difficult to travel from the chiefdom to get their salaries from Petauke (Zulu, 2009). Furthermore, the distribution of benefits from wildlife may be uneven between the wealthy and poor households in GMAs which may force households that do not benefit to access wildlife products illegally (Simasiku et al., 2010).

2.4 RURAL LIVELIHOOD ACTIVITIES AND DIVERSIFICATION

One way in which rural people utilise livelihood resources is through agricultural intensification (increase in output per unit area) or extensification (increase in land being used), and livelihood diversification (engaging in off-farm income-earning activities). Livelihood activities are often more successful when combined because sometimes agriculture has little influence on the villagers' livelihood strategies and non-farm activities can provide more-effective means of improving livelihood outcomes (Anderson et al., 2011; Asmah, 2011; Demissie and Legesse, 2013). However, despite diversifying strategies, the rural poor still tend to be highly reliant on agriculture in many regions (Ellis and Allison, 2004).

Kangalawe et al. (2008) examined how changing socio-economic and environmental conditions contribute to livelihood diversification, and argue that changes in macro and micro socio-economic conditions can lead to livelihood diversification. Ellis and Allison (2004) note that natural resources are fundamental assets in rural livelihoods, explore the links between livelihood diversification and access to natural resources, and argue that diversification reduces the vulnerability of rural households to socio-economic shocks. Watson and van Binsbergen (2008) examined pastoral diversification (i.e. pursuit of any non-pastoral income-earning activity in urban or rural environments) to illustrate that livelihood diversification may take many forms.

In some cases, rural livelihood diversification ranges from a temporary change of household livelihood portfolio (*occasional diversification*) to a deliberate attempt to optimize household capacity to take advantage of changing opportunities and cope with unexpected constraints (*strategic diversification*) (Warren, 2002). However, neither of the above types of diversification properly illustrate diversification as a rural livelihood strategy. By maintaining capability to operate a mixed set of activities, diversifying households are likely to enjoy greater capacity for *flexibility* and *resilience* than agriculturally-dependent rural households.

2. 5 WILDLIFE UTILISATION AS A LIVELIHOOD ACTIVITY

Livelihood strategies are means by which people maximize benefits from livelihood resources in order to sustain themselves (Scoones, 2009). This may include wildlife utilisation when wildlife resources are collected, processed and marketed by rural communities to minimize their food insecurity (Norfolk, 2004). A key advantage of sustainable wildlife utilisation is that it may offer an increased and more nutritious source of protein for households (Norfolk, 2004), which may explain why some

households rely increasingly on wild products in times of scarcity (de Merode et al., 2004). Similarly, Bowen-Jones et al. (2003) observed that for many rural populations, bush meat provides a flexible source of income, a direct source of affordable animal protein with good storage qualities, and a safety net in times of particular hardship.

2.6 GMA MANAGEMENT STRATEGIES AND RURAL LIVELIHOOD

In Zambia, the GMA management strategy has been driven by the need to involve local people in the management of GMAs. The Zambia Wildlife Act of 1998 recognizes local communities as partners in conservation of wildlife as well as the socio-economic and ecological importance of wildlife to the livelihood of people of GMAs. Two well-known programmes of community-based natural resources management (CBNRM) in Zambia that were superseded by the creation of CRBs were the Administrative Management Design for Game Management Areas (ADMADE) and the Luangwa Integrated Resource Development Project (LIRDP). Benefits from ADMADE and LIRDP rarely reached the local people. Kapungwe (2000), predicted that even the creation of CRBs faced the pending conflict over benefits and the use of funds to be generated from wildlife utilisation. Another problem with ADMADE and LIRDP seem to have arisen from the fact that local people did not identify themselves with these conservation programmes and decision making like revenue disbursement was trapped by local elites (Kapungwe, 2000).

Simasiku et al. (2008) has noted that wildlife management policies and conservation have generally not achieved their objectives. One possible reason for the failure of GMA management strategy is lack of adequate funding. CRBs not only frequently lack operational capacity but are often inadequately funded because ZAWA does not always remit sufficient revenue for the efficient running of CRBs (Fernandez, 2010).

In terms of conservation, local communities do not control the process because hunting licenses are issued by ZAWA and the hunters may over-harvest wildlife because they are not adequately supervised in most cases (Zulu, 2009). As noted by Simasiku et al. (2008, vi), the fact that "more than half of Zambia's GMA animal population have declined mainly due to poaching" may indicate failure of GMA management policy as a conservation tool. These authors further reported that 31 of 36 GMAs surveyed were not well managed, and concluded that "GMAs have failed to fulfil their purpose; namely to act as buffer zones to National Parks in order to protect wild animals and their habitats, and to support a viable wildlife-based tourism industry, which contributes significantly to the national economy and to the improvement of livelihoods in GMAs" (Simasiku et al., 2008, vii).

GMA management often also results in uneven distribution of benefits from wildlife because usually the majority of poor households do not participate. Usually the wealthier people in GMAs participate mostly at CRB level and are therefore in charge of funds from ZAWA "whereas the poor usually participate at VAG level, where resources are often limited and participation is typically more loosely defined" (Simasiku et al., 2010, 4). Thus, GMA communities are generally 30 per cent poorer on average than other Zambian rural communities (Simasiku et al., 2008).

Generally, CBNRMs have been classified into four types depending on organisations that play major roles in the conservation process (Campbell and Shackleton (2001: 87):

> (1) district-level organizations; (2) village organizations supported by sectoral departments (e.g. Village Forest Committees); (3) organizations or authorities outside the state hierarchy (e.g. traditional authority, residents'

associations), and (4) corporate organizations at the village level (e.g. Trusts, conservancies, property associations).

Whatever type of community participation, it has been noted that community involvement is not always a solution to wildlife conservation problems. This is because although people in GMAs are important in the conservation process, community engagement can be either or effective or a challenge (Roe, 2015 and Kowero et al., 2003). Effective or not, what is important in any CBNRM programme seems to lie in the involvement of three principles (Roe, 2015: 8): "increase in law enforcement and strengthening criminal justice systems; reducing demand/consumption; and supporting sustainable livelihoods and local economic development." The challenge that develops in the implementation of a successful CBNRM programme envisioned by Roe above is that community participation becomes a means to unclear ends (Campbell and Vainio-Mattila, 2003; Shackleton et al., 2002).

2.7 HUMAN WILDLIFE CONFLICT, CONSERVATION, AND RURAL LIVELIHOODS

Human-wildlife conflict (HWC) "includes crop raiding, livestock depredations, human injuries/death and other destructive conducts" (Meguro, 2009, vi). HWC clearly affects wildlife populations, especially when animals are killed in retaliation, and is common in GMAs because humans share the same environment with wildlife (Thirgood *et al*., 2005; Okello et al., 2014). Although humans may use wildlife for food, furs, and scientific research, wild animals may kill or injure humans, damage crops, kill livestock, and compete with humans as hunters for wild prey. These negative consequences of interactions between humans and wildlife affect human livelihoods, and become more common when populations of wildlife and humans increase; in turn, people may not see conservation as beneficial (Wambuguh, 2007;

Chomba et al., 2012). Wildlife can have direct costs for humans, such as loss of human life, crops, livestock, and livelihood resources (Mwakatobe et al., 2014). In the same vein, indirect costs can be time and money spent on preventing damage from wildlife, as well as opportunity costs "in terms of the income forgone from those activities that are precluded by the presence of wildlife" (Thirgood et al., 2005, 13).

HWC also presents a serious challenge to conservation and wildlife. For instance, people may believe there is no benefit from conservation when there is serious human-wildlife conflict, or when there is suffering because of the costs of living with wildlife (Chomba et al., 2012). However, it should be noted that wild animals usually bear the brunt of HWC when they are hunted by humans. In the end, HWC often threatens to reverse the positive achievements of conservation (Nyhus and Tilson, 2004).

CHAPTER 3: DESCRIPTION OF THE STUDY AREA

3.1 LOCATION AND SIZE OF MUKUNGULE GMA

Mukungule Game Management Area (MGMA) is in Mpika District of Muchinga Province, northern Zambia, adjoining the western boundary of North Luangwa National Park (NLNP). The greater part of the boundary between MGMA and NLNP is the Muchinga escarpment. To the north-east of MGMA is Musalangu GMA while to the south is Luangwa National Forest Reserve. The GMA is 1,900km² in area lying between latitude 11°10' to 11°53' south and longitude 31°36' to 32°14' east (Figure 3.1).

3.1.1 LOCATION AND STUDY SITES IN MGMA

This study was conducted in MGMA, which starts from about 10km from Mpika town. The study was carried out in five study sites in MGMA: Mukungule (11˚35ˈS 31˚55ˈE), 50km from Mpika town; Chipundu (11˚48ˈs 31˚34ˈE), 12km from Mpika town; Mwansabamba (11˚52ˈS 31˚29ˈE), 13km from Mpika town; Kaluba (11˚47ˈS 31˚40ˈE), 6km from Mpika town; and Nkomba/Kakoko (11˚15ˈS 31˚54ˈE), 125km from Mpika town, respectively. These five sites were chosen because there wasn't enough time to cover all areas in Mukungule and because the five sites were well spread to give a general view about Mukungule.

Figure 3.1 Location of MGMA

3.2 BRIEF HISTORY OF THE MUKUNGULE CHIEFDOM AND GMA

The Bisa people of Mukungule originated from the Luba Kingdom in present day Democratic Republic of Congo. They settled in the Luangwa Valley but were relocated to the western side of the Muchinga escarpment in 1945 by the colonial government, after the valley was identified as a good location for a game reserve. Although NLNP was declared in 1971, Mukungule was only declared as a GMA (number 39) in 1998 (ZAWA, 2004). Mukungule GMA has 9 Village Action Groups (VAGs) areas, namely Mwansabamba, Chipundu, Kashaita, Kaluba, Katibunga, Chobela, Mukungule, Chishala, and Nkomba.

3.3 PHYSICAL ENVIRONMENT

3.3.1 Relief and Drainage

MGMA is approximately 1200m above sea level. The most-northern part of the GMA comprises loose standing hills rising to almost 1500m above sea level at the foot of the Muchinga escarpment. The southwest boundary of the GMA follows the Kalenga Mushitu mountain range while the southeast boundary with North Luangwa National Park follows the Ibangwe hills.

MGMA has a number of perennial rivers and streams, including the Kapamba, Mwaleshi, Lufila, and Luswa rivers, and Muneshi, Mwanswa, Mushishe, Mufushi, and Chipembele streams. These rivers and streams form an important integral part of the drainage system of NLNP. Drainage in the east of Mukungule is more sedate and gives rise to the Luangwa River. Understanding the relief and drainage of Mukungule GMA is important because it relates to the main sources of water needed by both wildlife and humans. The perennial streams are the source of water for gardening and other agricultural activities undertaken by the majority of people in Mukungule GMA.

3.3.2 Climate

The temperature in MGMA rarely exceeds 30°C. MGMA has rainfall ranging from 800mm to 1,200mm each year, with average annual precipitation of 900mm. Rainfall up to 1,250mm per annum has been experienced in Mukungule GMA. The GMA experiences typical tropical climatic conditions with three distinct seasons: the hot-wet season (November to April), cool-dry season (May to August), and hot-dry season (September to November). Climate is important because it influences vegetation and other conditions conducive for wildlife to survive.

3.3.3 Vegetation

Mukungule GMA lies on the upper Muchinga escarpment. The dominant natural vegetation in the area is dry miombo woodlands transected by intermittent open grassland. Miombo trees are primarily the generas *Brachystegia, Julbernardia* and *Isoberlina (Fabaceae,* subfamily *Caesalpinioideae).* Mopane woodland does not dominate because the vegetation has been degraded by human activities as well as large herbivores such as elephant, hippopotamus and buffalo (ULG 1995). Miombo woodlands are not only important to the spiritual or cultural needs of the local people but also provide products such as fuel (Campbell et al., 1996; Malmer, 2007). The mix of miombo and mopane also provides habitat for a wide variety of wild animals. Soils in MGMA are highly weathered and heavily leached (Lungu, 2001). Understanding the vegetation and soils of MGMA is important because it shapes the socio-economic activities of local people.

3.4 SOCIO-ECONOMIC ENVIRONMENT

3.4.1 Population

There are approximately 2,535 households in MGMA (CSO, 2012). The population in MGMA has been increasing at approximately 3.4 per cent and this increase in

human population increasingly threatens wildlife and its habitat. As a result there has been an increase in wildlife off take. Population increase in MGMA has led people to set fields in areas suitable for animal habitat as people need more land for cultivation to sustain their households (ZAWA, 2004).

3.4.2 Agriculture

Livelihoods of people in MGMA involve a combination of strategies and resources relating to crop-based agriculture and gardens, natural resource utilisation (weaving, hunting, fishing, and carving), Livestock kept include sheep, goats, pigs, cattle, chicken, rabbits, guinea fowls, pigeons, guinea pigs and ducks. It should be noted that livestock keeping is on a small scale because of environmental conditions. Crops grown include maize, groundnuts, finger millet, sweet potatoes, cassava, sorghum, sunflower, soybeans, beans, peas, monkey nuts, as well as vegetables and cowpeas that are less demanding in inputs. Maize is the main staple food crop but has dropped in prominence due to high costs of fertilizers and crop damage by wildlife. Consequently, practice of *Chitemene* farming methods has increased (ZAWA, 2004).

3.4.3 Artefacts

Artefacts that are produced in Mukungule GMA include mortars, stools and chairs, axe handles, cooking sticks and doors. Basketry products include baskets, reed mats, and hats. Blacksmith products are mainly axe and hoes. These products are not only for home use but they are also sold in Mpika town or within villages (ZAWA, 2004).

3.4.4 Income generation

In terms of income availability, some households in the Mukungule GMA generate income from beer brewing or selling groundnuts, sunflower, beans, chickens, goats,

pigs, sheep, or doors. Maize, finger millet and cassava generate medium-level earnings because, for these crops, households have to divide harvests between home consumption and sale for cash (ZAWA, 2004).

CHAPTER 4: STUDY METHODS

4.1 DATA COLLECTION

4.1.1 Research Instruments
Interview schedules for households (Appendix 1) and key informants (Appendix 2) were designed and formulated by the researcher. In order to identify any potential shortcomings in the questions, a pre-test (pilot study) of the interviews and field processes was conducted (Kothari, 2004). After this pilot study, questions were refined to ensure the meaning was clear and respondents were unlikely to misinterpret questions. The number of questions was also reduced to conduct the interviews in reasonable time, to minimise demands on respondents and avoid interview fatigue (Bernard, 2006). Questions were also rearranged to align with the main themes of the study. Both closed and open-ended questions were used in order to gain a comprehensive account from interviewees' responses (Bernard, 2006; Kombo and Tromp, 2009).

4.1.2 Primary Data

Primary data was collected through semi-structured household interviews within communities in MGMA coupled with interviews with key informants. The interview schedule or interview guide (Appendix 1) was used to collect information from respondents about wildlife utilisation and rural livelihoods as well as local human-wildlife conflict. Semi-structured interviews were also conducted with a range of key informants such as Chief Mukungule (the traditional leader of MGMA), village headmen, officers from the Forestry Department, CRB members, VAGs leaders, and ZAWA officers using the key informant interview schedule (Appendix 2). The household and key informant interviews provided detailed information about drivers of wildlife utilisation, effects of HWC on rural livelihoods, benefits that accrue from

wildlife conservation, the impacts of wildlife policies on rural livelihoods, and challenges faced for wildlife conservation in Mukungule GMA. Both qualitative and quantitative data were collected.

Semi-structured interviews facilitate use of both open and closed questions, enable a more complete and detailed understanding of issues being explored (in this case, bush meat utilisation and rural livelihoods), and are more interactive with respondents than many other data collection methods (Bernard, 2006). The flexibility of question content and order in semi-structured interviews also allows probing by interviewers, encouraging informants to elaborate on their views and posing of further questions arising from the information provided (Kothari, 2004; Kombo and Tromp, 2009).

4.2 SAMPLE SIZE AND SAMPLING PROCEDURE

Mukungule has a total population of 2,535 households (CSO, 2012). Using the five per cent rule of thumb method, a sample of 127 of the 2535 households was deemed appropriate for the research and generalising across households within MGMA. Households were selected using opportunistic sampling while walking through village areas. A sample size of 127 was also appropriate to gain sufficient breadth and depth of information from respondents within the limited time available for data collection. Interviews were conducted in 20 villages across the five study sites: Chipundu, Kaluba, Mukungule, Mwansabamba, and Nkomba/Kakoko. In order to have a balanced view about conservation and livelihood issues, and avoid potential gender bias, 51 per cent of the sample (n = 65) were female and 49 per cent (n = 62) were male.

4.2.1 Sampling Techniques

Opportunistic (or convenience) sampling was used because detailed lists of households are not maintained in Mukungule GMA (thereby precluding structured or random sampling) and this was the method most likely to ensure a representative sample (Bernard, 2006; Kombo and Tromp, 2009; and Newing, 2011). Interviews were conducted with available and willing respondents in each study village. It is believed the sample was representative of the broader population of Mukungule GMA. Similarly, non-response bias and non-sampling error were minimised by ensuring all respondents understood the questions asked, participation was not forced, and responses were given freely.

4.3 SECONDARY DATA

Secondary data were collected from various published sources. Information was collected from existing literature to complement and extend the research findings on drivers of wildlife utilisation in rural areas, effects of HWC on rural livelihoods, impacts of rural livelihoods on wildlife conservation, and effects of wildlife management policies on rural livelihoods. Secondary data were used to provide a wider understanding of current research within the context of my study, and helped in consolidating my research findings.

4.4 DATA ANALYSIS

Collected data was collated and then coded to identify recurrent themes and responses, particularly for qualitative information. Descriptive statistics (mainly frequencies and proportions such as percentages) were used for analysis, particularly for quantitative data. Microsoft Excel and SPSS version 18.0 were used to generate graphical representations of data to display relationships and illustrate the results. Because data were not normally distributed, the non-parametric Chi-square test was

used to test the relationship between bush meat utilisation and wildlife conservation, as well as the relationship between conservation and rural livelihood. The Simpson Diversity index was used to measure the diversity of livelihood activities in MGMA (Appendix 3).

4.5 Research Team

Field work was conducted in MGMA between 22nd April 2014 and 13th May 2014 by the researcher and four field assistants. Because interviews were conducted in English with translation to and from Bemba, the interview schedules (Appendices 1 and 2) were rehearsed and key words and their equivalent in Bemba language were discussed with the assistants. All assistants were fluent in Bemba and had been working in the study area with the Conservation Research for East Africa's Threatened Ecosystems (CREATE) Project operated by Frankfurt Zoological Society (FZS). The assistants were familiar with the area and local communities, trained by the researcher regarding procedures for the study, and their experience was valuable for the research process.

4.6 PROBLEMS AND LIMITATIONS OF THE DATA

The sensitivity of researching wildlife utilisation, which can be an illegal activity, was potentially a challenge for the research process. This was largely overcome by introducing the research openly with community and village leaders, ensuring participation was voluntary and building trust and rapport with respondents (Bernard, 2006). In some cases answers required further probing, while some potential informants shunned away from being interviewed because they feared they might be labelled as informants for ZAWA.

The research was not part of a longitudinal anthropological study conducted over a number of years, and therefore it was not possible to assess data, changes, or impacts over time.

CHAPTER 5: RESULTS AND DISCUSSION

5.1 DRIVERS OF BUSH MEAT UTILISATION IN MGMA

Despite non-governmental conservation efforts and ZAWA's protection actions, prosecutions for involvement in illegal bush meat hunting in MGMA have increased over the four years from 2010 to 2013 by a factor of 3.7 (Figure 5.1). Similarly, if prosecution records between January and May 2014 (n = 36) are extrapolated over a full year, it is probable that the total for 2014 would have increased by almost 60 per cent beyond 2013. Data for 2014 in Figure 5.1 have been extrapolated over the full year based on 36 prosecutions to May 2014 (i.e. 36/5 months x 12 months = an estimated 86 cases.
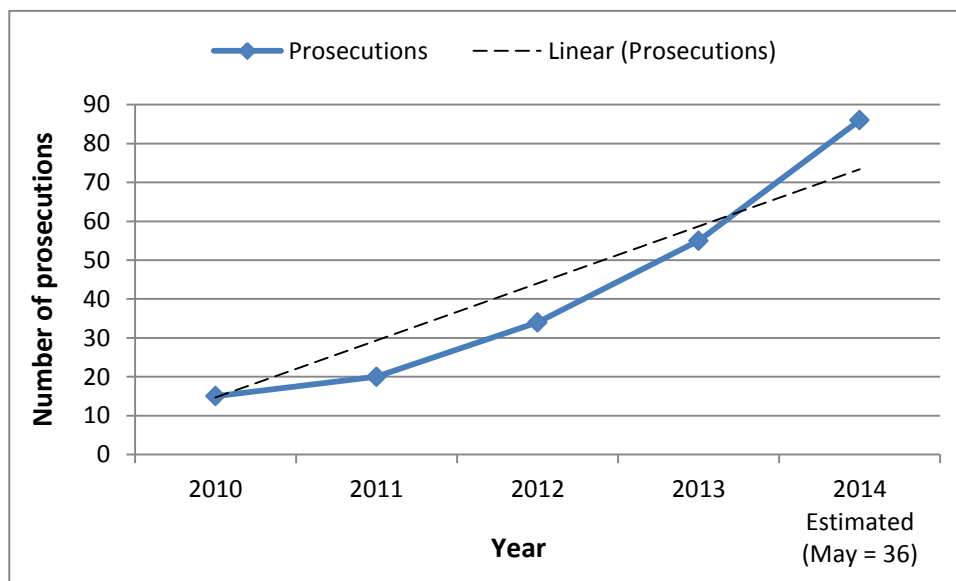
Figure 5.1 Prosecutions of illegal bush meat utilizers.
Source: ZAWA Annual reports, 2010-May 2014.

Furthermore, restrictions on hunting and penalties imposed on illegal hunters (poachers) have not eliminated illegal hunting in Mukungule. Evidence for illegal bush meat utilisation can also be seen from ZAWA records of confiscations of bush

meat, confirming that more than 2,000kgs of bush meat have been confiscated each year from 2010 to 2013, and 724kgs confiscated between January and May 2014 (ZAWA Annual Prosecution Reports). This scenario of growing illegal utilisation of wildlife made it relevant to investigate drivers for bush meat utilisation.

From the research results, reasons for hunting in MGMA varied considerably and depended on the individual hunter and their social and economic environment. Based on answers from 127 respondents, reasons for bush meat utilisation ranged from the need to generate income, the need for protein, cultural aspects, human-wildlife conflict, misapplication of traditional knowledge, and poor governance (Table 5.1).

Table 5.1 Drivers of bush meat utilisation

DRIVER	FREQUENCY	
	NO.	%
Income	44	34.6
Protein or taste	33	26.0
Cultural aspects	23	18.1
Human-wildlife conflict	11	8.7
misapplication of traditional knowledge	11	8.7
Poor governance	5	3.9
TOTAL(n)	127	100

Source: Field data

When drivers of bush meat utilisation were considered in specific study sites, the need for income and protein were identified most frequently as drivers of bush meat utilisation while HWC and poor governance were identified by fewer respondents in most study sites as drivers of bush meat utilisation (Table 5.2).

Table 5.2 Drivers of bush meat Utilisation at the study sites

DRIVER	STUDY SITES									
	Chipundu		Kaluba		Mukungule		Mwansabamba		Nkomba/Kakoko	
	No.	%	No.	%	No.	%	No.	%	No.	%
Income	9	42.9	11	50	3	17.6	12	41.4	9	23.7
Protein or taste	6	28.6	5	22.7	2	11.8	8	27.6	12	31.6
Cultural aspects	3	14.3	2	9.1	5	29.4	4	13.8	9	23.7
HWC	1	4.8	1	4.6	3	17.6	1	3.5	5	13.2
Lack of knowledge	2	9.5	1	4.6	3	17.6	3	10.3	2	5.3
Poor governance	0	0	2	9.1	1	5.9	1	3.5	1	2.6
Total (n)	21	100	22	100	17	100	29	100	38	100

Source: Field data

Regardless of reasons given for bush meat utilisation, most respondents answering questions about impacts on conservation understood the possible effects of hunting on wildlife populations, stating that bush meat utilisation affects conservation of wildlife by potentially leading to reduction of wildlife populations (58.3 per cent) or extinction of certain species of animals (25 per cent) Chi-square tests confirmed that significantly more respondents perceived that there is an association between bush meat utilisation and conservation ($x^2 = 63.368$, $df = 1$, $p < 0.001$) and also that wildlife utilisation is associated to conservation ($x^2 = 83.535, df = 1, p = 0.001$). Only 16.7 per cent stated that bush meat utilisation had no effect on wildlife conservation, stating that utilisation of bush meat by local people was not sufficiently extensive to impact wildlife negatively. The findings from this study are compared to results from other studies by discussing the results in the sections that follow:

5.1.1 Cultural Aspects

ZAWA confiscation records show that the vast majority (86.7 per cent) of weapons and tools used in hunting wildlife illegally are homemade, while almost all wildlife hunted (91 per cent of animals confiscated) can be utilised as relish. In this study, 18.1 per cent of respondents stated that people hunted because of their culture (Table 5.1). In this line, the hunter's institution is an old institution which survives in modern times, because the hunter's expertise of the wild is remains relevant and is respected by rural people who benefit from it. The resilience of the hunter's institution can also be seen as a successful adaptation of a traditional livelihood activity to a modern environment (Garland and Carthy, 2010). This is because many hunters have adapted to a modern international market (especially if they sell high

value wild products such as ivory) and their traditional hunting tools (such as spears) have been supplemented with gun technology.

The relevance of rural hunters within their communities, moreover, cannot be overlooked. Hunters in rural communities with no access to hospitals or clinics are a source of medicine because they are able to venture into the wild to collect required medicines. For example, some key informants pointed out that only hunters "can have a black mamba's entrails to give to an individual who needs poison to kill something or even somebody; only hunters can have python fats or tortoise shell for treating burns; or the porcupine's feather for treating soles; the elephant's faeces to control nose bleeding; medicines for snake bites; or even the lion's hairs for power and individuals who want others to fear them."

Thus, hunters in rural societies are respected as courageous individuals; individuals who can be helpful in times of trouble and also dangerous because of their knowledge of medicines associated with witchcraft. As one informant responded, "hunters' hearts are 'dry' because they can even kill other humans as if they are killing an animal." This entails that as hunting knowledge inherited from earlier generations continues to be relevant in rural areas, individuals will continue hunting and wildlife conservation will be affected negatively. As Child et al. (2012: 8) state:

> When poachers become Robin Hoods and are protected by their communities, wildlife laws become difficult to implement. This creates a negative relationship between local people, wildlife, and the state.

Hunters usually inherit their knowledge of the wild and skills to survive from older generations, and in turn pass that knowledge to younger generations. Udelhoven (2006: 78) confirms this about medicines in the Luangwa Valley when writing that:

> Young hunters depended on their family (fathers and relatives) for access to medicines: hunting and medicines were intrinsically connected, and though

one could acquire medicines also from a *ng'anga* (but only with payments), much stayed within the families.

As such, a hunter may be seen as a criminal in the eyes of the government but the picture is often different in their families, villages, or chiefdom, where they are valued as important (Carpaneto and Fusari, 2000). This is also supported by Mfunda et al. (2010: 268) who noted that:

> Local people do not share the authorities' definition of an illegal bush meat hunter or a poacher. People identified as poachers are perceived as hunters. The term 'poacher' represents the criminalization of traditional bush meat hunters through legal construction.

Because of their perceived relevance, poachers, transmit their hunting skills to younger people so that they become powerful in their society rather than allowing them to go to school. This has remained a practice in most areas across MGMA despite various government wildlife conservation programs. Other studies have also demonstrated that hunting as a key part of culture persists as a driver of hunting bush meat (Jones, 2006; van Vliet, 2011; Groff and Axelrod, 2013).

One example that shows the difficulty of controlling 'inherited' or learnt skills in Mukungule GMA involves hunting tools used. ZAWA annual prosecution reports between January 2010 and May 2014 indicate 86.7 per cent of tools confiscated from illegal hunters are made using indigenous knowledge. That is, makers and users of such tools do not need to attend a formal institution to learn how to make and use them. Of the confiscated homemade tools, 52.6 per cent were snares, 30.4 per cent were homemade shotguns or muzzle loading guns, and 3.0 per cent were spears. The prevalence of wire snares is because they are 'silent killers' that do not easily attract the attention of ZAWA's patrolling officers and, unlike guns, they do not scare prey. Also, snares are made from affordable materials and therefore produced at low cost (Hennessey and Rogers, 2008; Lindsey et al., 2013).

Homemade guns are also common because the pellets or gun powder used is readily

made from used radio batteries (Figures 5.3 and 5.4).

Figure 5.2 Hunting tools in MGMA: (A) Guns confiscated by ZAWA (B); HMLG
and snare.
Source: Field data

Figure 5.3 Hunting tools in MGMA: (A) Gun powder made from used radio batteries; (B) Snares, homemade bullets, and modern bullets.
Source: Field data

One key informant stated that, a 2012 programme to collect hunting tools from villagers in Mukungule area (who could hand over their tools voluntarily without fear of prosecution) continues to have some success, with more than 60 homemade guns collected by traditional leaders who in turn hand over the guns to ZAWA officers. When compared to 41 HSGs and HMLGs confiscated by ZAWA from poachers between January 2010 and May 2014 (ZAWA Annual Prosecution Reports), it becomes clear that there are more guns owned or made by people in MGMA.

Moreover, the success of asking people to voluntarily surrender their weapons and tools is hindered by the fact that rural people still have the knowledge required to make hunting tools, and even pellets used in homemade guns, which they can employ at their convenience. Thus, although suspected hunters can easily hand in their guns they can also easily make new ones and continue hunting.

As stated by one key informant, it should be noted that some hunters also have a good understanding of wildlife habitats and behaviour. Hunters usually know where to find different types of wildlife and at what times of the year; they also often know which areas are not patrolled frequently by ZAWA officers. When such knowledge is combined with readily available hunting skills and tools, hunting easily becomes a livelihood activity.

5.1.2 Lack of knowledge

Another driver that seems to be connected to cultural aspects is lack of knowledge attributed to poachers. 8.7 per cent of respondents (Table 5.1) argued that people hunted due to misapplication of traditional knowledge. Following traditional knowledge in modern times can be perceived as 'lack of knowledge' because traditional and modern knowledge can sometimes conflict. It is clear that many hunters can be said to lack understanding only because they misapply their knowledge, because they do it illegally in a parallel structure. Accordingly, the hunter's knowledge is often not useful or relevant for conservation purposes because it is destructive and they are not licenced to hunt. Thus, traditional hunters usually hunt illegally as today's poachers because their knowledge of animals and animal habitat is never used to conserve. The resulting hunting from such knowledge is also not regulated. A knowledge-based approach is required to enable a successful solution to poaching or transforming poachers to conservationists (Lindsey, 2008 and Shackeroff and Campbell, 2014)

5.1.3 Poverty and protein needs

Fernandez (2010) has pointed out that most households in rural Zambia are poor. Poverty as an important driver for illegal wildlife hunting was reflected in this study by identifying income and the need for protein as major reasons for illegal hunting.

That is, hunting was not only a solution to dietary problems or shortfalls but also addressed the economic needs of people in Mukungule GMA. Overall, 28.5 per cent of respondents stated that hunting was a means of solving economic problems, and the same proportion stated hunting was a key source of protein.

Table 5.3 Animals found in MGMA

Species	Distribution	Time of the year
Duiker	Every where	Throughout the year
Bush pig	Every where	Throughout the year
Monkeys/ Baboons	Every where	Throughout the year
Impala	Every where	Throughout the year
Kudu	Mukungule, Chobela, Chishala, Chipelembe village and Chisansa stream (Kaluba)	April – Sept
Buffalos	Chishala, Chobela, Mukungule, Lufila river, Mutekwe, Munenshi river and Chisansa swamps	Throughout the year
Elephants	Chishala, Nkomba, Mukungule, Chobela, Mufushi stream and Lufishi	-Dry hot season in Mufushi stream and Lufishi. Throughout the year in the other areas
Lions	Follow other animals	Follow animals
Hippo	Kampamba, Mwaleshi, Lufila, Mwanswa, Mupete and Muneshi rivers	Rain season
Bush buck	Everywhere	Throughout the year
Sitatunga	Mwamfushi – Chipundu area	Throughout the year
Zebra	Mukungule, Chobela, Chishala	June – December
Water buck	Everywhere	Throughout the year
Eland	Nkomba, Chobela, Chishala	April – Aug(Chobela, Chishala)Aug – Dec (Nkomba)
Grysbok (Katili)	Nkomba, Chobela, Chishala and Mukungule	Throughout the year
Hyena	Chobela, Nkomba	Throughout the year
Sable Antelope	Nkomba, Chobela, Chishala and Mukungule	July – December
Reedbuck	Nkomba, Chobela, Chishala and Mukungule	Throughout the year
Roan Antelope	Nkomba, Chishala and Mukungule	May – December
African Jackal	Nkomba, Chobela, Chishala and Mukungule	Throughout the year
Porcupine	Nkomba, Chobela, Chishala and Mukungule	Throughout the year
Leopard	Nkomba, Chobela, Chishala and Mukungule	Throughout the year
Warthog	Nkomba, Chobela, Chishala and Mukungule	Throughout the year
Crocodile	Kapamba, Mwaleshi and Lufila Rivers	Throughout the year

Source: MGMA Land use plan

From the list of common animals in MGMA (Table 5.3), ZAWA records for confiscation of bush meat showed that common duiker (*Sylvicapra grimmia*), buffalo (*Syncerus caffer caffer*), and black lechwe (*Kobus leche*) are the species confiscated (and therefore probably hunted) most frequently (Figure 5.4)
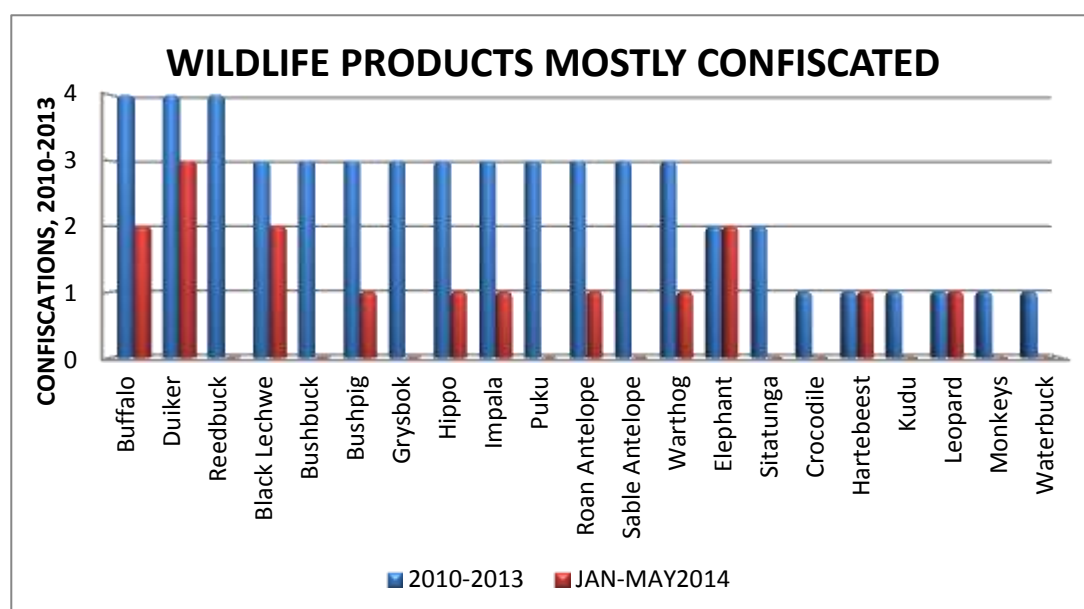
Figure 5.4 Wildlife products mostly confiscated.
Source: ZAWA annual reports.

Animal species rarely confiscated (and therefore probably hunted less often) are lions (*Panthera leo*), porcupines (*Hystrix africaeaustralis*), hyena (*Crocuta crocuta*), African jackal (*Canis adustus*), leopard (*Panther pardus*), zebra (*Equus burchelli)* and vervet monkeys (*Cercopithecus aethiops*) (Zieger and Caudwell,1998 and ZAWA, 2004). These animals may be too dangerous and difficult to hunt, while their skins may be difficult to sell or have limited use for hunters. Animals that are not a source of protein also have limited market value (Loibooki et al., 2002; Bifarin et al., 2008). As Ajonina et al. (2014) observed, hunters usually focus on animals which can be sold easily to consumers or which maximize their yield per unit effort.

There is a link between income and protein because earned income usually acts as a cushion against 'bad taste' and 'bad food'; people hunted to avoid having only

vegetables as relish. In this sense, eating bush meat is a matter of taste, and it becomes a matter of preference when bush meat is preferred over other meats (Garland and Carthy, 2010). Eating bush meat also becomes a matter of status if meat is bought from a poacher because it points to consumer's ability to buy (de Merode et al., 2004). If the poacher's aim is to sell in order to earn money, then the income generated from such transactions affords him or her not only other types of meat, such as beef, but also increases the poacher's purchasing power to meet other needs. As a source of income, the decision to hunt is made with a view of subsidising the needs of hunters and their families, and to act as a safety net in hard times (Bowen-Jones et al., 2003; Groff and Axelrod, 2013).

Another factor that makes hunting for protein an important economic activity in this study was the inability of some people in MGMA to buy other kinds of meat. That is, individuals with hunting skills view hunting as the easiest way of obtaining meat. To poachers, bush meat is not only affordable because it is 'free' but also because it is easy to access. Poachers often cannot afford to buy meat or purchase hunting licenses to hunt legally, and so see the value of employing their hunting skills to meet their dietary and fiscal needs Wilfred and MacColl, 2010; Mwakatobe et al., 2012; Nuno et al., 2013). As one informant asked, "what is the point of walking more than 60km or 70km to town to sell your products, then buy meat or fish when you have wild animals eating your crops?" With seemingly no easily accessible non-hunted animal protein in MGMA, hunting bush meat is an easy alternative (Drury, 2011). It should be noted that unlike van Vliet's observation about other African cities, bush meat in Zambian cities is an expensive source of protein because of the complicated process involved in acquiring bush meat; only in rural areas is bush

meat perceived as "free protein because it can be captured rather than purchased" (van Vliet, 2011 : 13).

It should also be noted that the responses about hunting being a solution to poverty because it is a source of income comes with an understanding of the risks involved (Table 5.1). According to some key informants, poachers understood the risks and benefits of illegal hunting. Figure 5.5 illustrates the risks involved in hunting and its link to the solution to poverty:
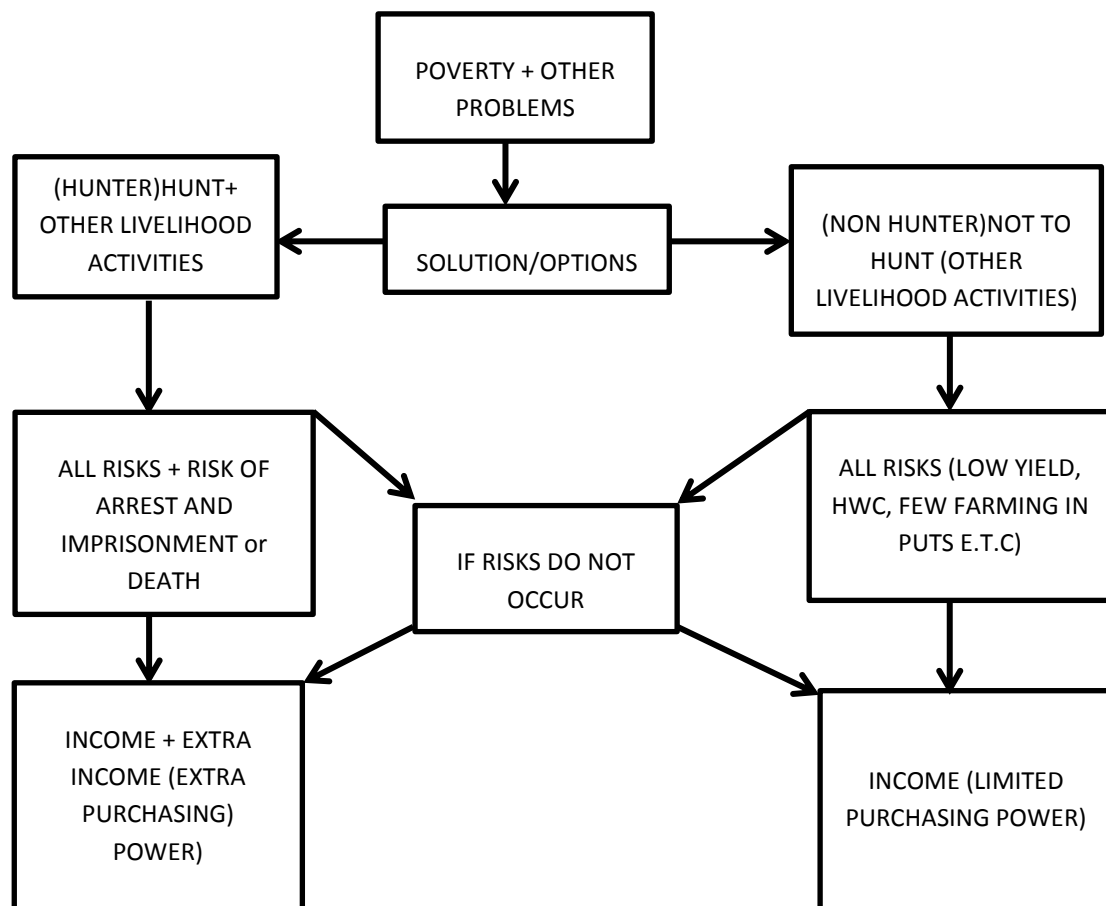
Figure 5.5 Hunting risk and solution to poverty.
Source: Field Data

From figure 5.5, it can be noted that although hunting gives hunters extra purchasing power compared to non-hunters, it is risky and not an easy source of income or protein. Poachers may still hunt because they have judged that the probability of

being caught hunting illegally is equalised by the gains in the transaction. That is, the high risks they take result in large pay offs and rarely materialise. For example, poachers know there is a ready market for bush meat and they do not need to compete for buyers, unlike the case with farm products. This is in line with Groff and Axelrod (2013: 286) who argue that subsistence motivates hunting and that:

> According to the rational choice theory, people who continue to poach weigh costs and benefits of poaching and determine whether their gains from poaching outweigh the risk of punishment.

However, it should be noted that the poacher's 'extra' income is not an indication that they have a better standard of living than non-hunters, because sometimes they are poorer than non-hunters. Hunting is an income alternative that addresses immediate income concerns and not geared for accumulation of wealth. Thus, for most households in MGMA hunting is a part-time venture and was not identified as a major livelihood activity that would impact their livelihood in a major way if it was not successful (section 5.2 discusses on livelihood activities). Whether hunting is for protein or income, it is done for personal consumption and also suggests a lack of income alternatives (Fernandez, 2010). Studies indicate that since hunting can be a lucrative business, hunters are among the wealthiest in their communities (Lindsey et al., 2013). This is not the case in MGMA because illegal hunting does not guarantee a steady source of income and rarely leads to the accumulation of wealth.

5.1.4 Poor game management

The way wildlife has been managed in Mukungule GMA was also a reason why people hunted animals illegally (Table 5.1). Failure to control wild animals from foraging near human field and settlements often results in human-wildlife conflict, which leaves people vulnerable to attacks by wildlife and their fields exposed to foraging by wildlife. The realisation by people that they have to protect themselves

and their crops can drive them to kill wildlife. "*Ukuya ku mitanda na ukwamina*" or the practice of camping at one's field and making noise to drive animals away during harvest time is common in Mukungule GMA.

The practice is dangerous and cumbersome, often works against agricultural extensification because large or multiple fields are difficult to maintain (except in Kaluba where there are permanent farming blocks), and can make farming a challenging livelihood activity. Camping at one's field is an indirect cost that results from presence of wildlife (Thirgood et al., 2005). The negative consequences of human-wildlife interactions that affect both conservation and human livelihoods have also been noted (Wambuguh, 2007; Chomba et al., 2012; and Okello et al., 2014).

One key informant observed that, the fact that ZAWA has no compensation policy and its management programme seemingly operates without continuous evaluation has made people perceive they have been left to their own devices. Although killing wild animals found within one's crop field, with evidence of crop damage, rarely attracts penalties from ZAWA, people do not only hunt simply because animals damage their crops; they also hunt because they cannot identify with conservation concerns or programs that are perceived to provide few or no direct benefits. This is also in line with Nyhus and Tilson, 2004 and Chomba et al., 2012 who demonstrate that HWC has negative implications for conservation because people fail to see the need of conserving wildlife. Moreover, when it came to the management of MGMA, it was further noted that people also hunted because some areas where they have settled are rarely patrolled by ZAWA officers, especially in the wet season when roads become impassable.

5.2. RURAL LIVELIHOOD ACTIVITIES AND WILDLIFE CONSERVATION

5.2.1 Livelihood activities in MGMA

Respondents identified ten main livelihood activities in Mukungule GMA. Farming was the dominant activity among the identified livelihood activities, followed by gardening (Table 5.4 and Figure 5.6).

Table 5.4 Livelihood activities in MGMA.

Livelihood activities	Frequency	
	NO.	%
Conventional and *chitemene* farming	74	58.3
Gardening	22	17.3
Business	10	7.9
Beer brewing	6	4.7
Crafts	4	3.2
Domestication	4	3.2
Bricklaying	3	2.4
Employment	2	1.6
Charcoal production	1	0.8
Fish farming	1	0.8
Total (n)	**127**	**100**

Source: Field data
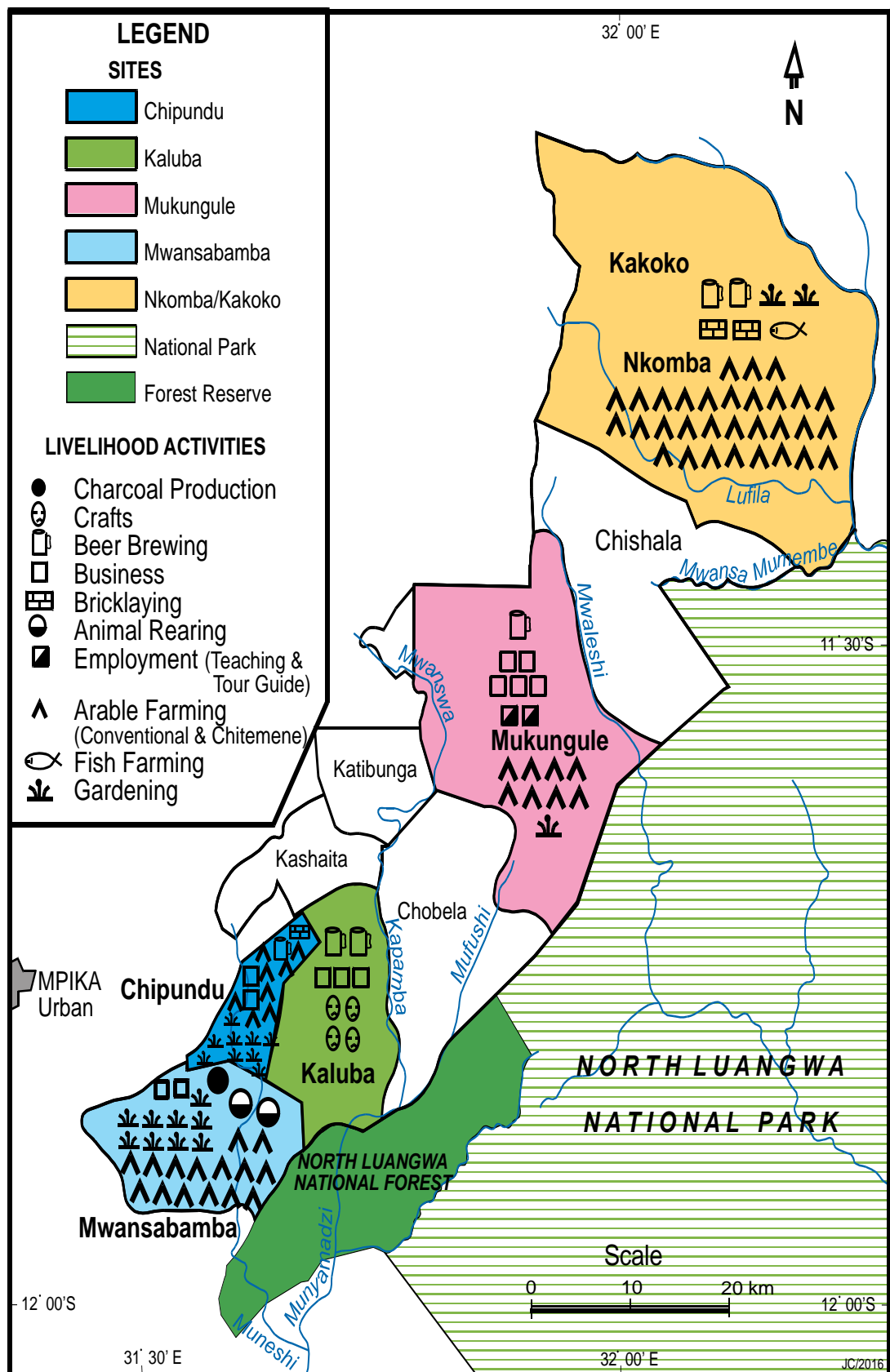
Figure 5.6: Livelihood activities in specific study sites

Although ten main livelihood activities were identified, only five were reported in Chipundu, Mukungule, Mwansabamba, and Nkomba/Kakoko, and four in Kaluba. Charcoal production and livestock farming were only reported in Mwansabamba, crafts only in Kaluba, employment only in Mukungule, and fish farming only in Nkomba/Kakoko. Subsistence farming was a main livelihood in all areas and reported by most respondents, while beer brewing, business, and gardening occurred in four of the five areas surveyed (Figure 5.6).

It should be noted that rural dependence on wild products cannot be overlooked. This is because most livelihood activities in rural areas depend on wildlife like birds, reptiles, amphibians and insects such as caterpillars; plants including mushrooms, medicinal plants. Examples of wild products like mushrooms (*Katoto and Tente*) and charcoal are shown in figure 5.7 below. Other varieties of Mushrooms in Mukungule included *busefwe, utunkulubindi, chisuku, kabansa,chitondo, impunfya, ichinkungwa, iminsholomwe, samfwe(insanfu)* and *tande*.

Figure 5.7 Products of livelihood activities in MGMA. Mushrooms and maize (A) and charcoal (B).

Source: Field data

5.2.2 Bush meat utilisation as a livelihood activity

Although poaching was identified as an activity which affects conservation, it was not reported as a main livelihood activity (Figure 5.8). However, this is to be expected when investigating an 'underground' economy or illegal activity. It was noted that 25.4 per cent of respondents stated that poaching impacted on the conservation of wildlife negatively (Figure 5.9), but only farming/*chitemene* and charcoal production were identified as livelihood activities that affect wildlife conservation. It was also noted that poaching did not involve direct utilisation of identified important livelihood resources such as land, water, or forests, nor was wildlife reported as a livelihood resource.
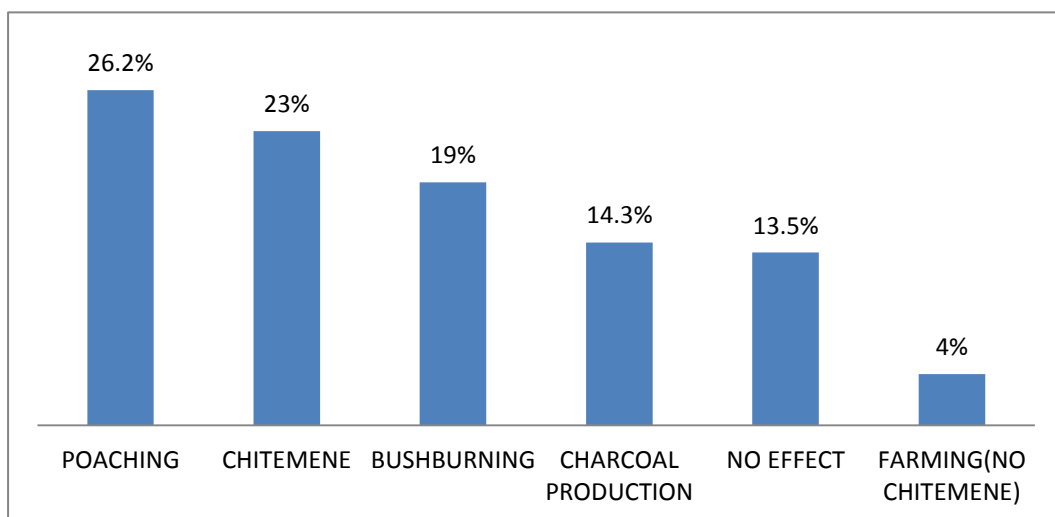
Figure 5.8 Activities that affect conservation in MGMA.
Source: Field data

Illegal bush meat utilisation as an underground economy involves more complex activities that should not be reduced to their illegality (Epstein, 1994). This is possibly why bush meat hunting has persisted, even though it is an illegal activity and attracts penalties on conviction. What can be noted is that poaching is not only driven by culture and the needs of poachers, but also by the indirect moral justification given to poachers by purchasers of bush meat because buying approves

the activity indirectly. As Gibson and Marks (1995: 952) noted, changing behaviour from wildlife consumption to wildlife conservation requires an understanding of local hunting because:

> Different groups subsumed in the category "community" interact with wild animals in different ways: hunters will possess different incentive structures about wildlife resources from non-hunters, women, resident civil servants… Currently, local hunters are individuals targeted only for punishment.

The lack of diversity of livelihoods and non-sustainability of livelihood activities that supplement farming in MGMA increases the likelihood that people will engage in illegal hunting of wildlife. However, even poachers in MGMA engage in farming and only turn to illegal hunting in order to supplement this main livelihood activity. In this sense, poaching is usually not a main livelihood activity that people in MGMA engage in. this is in line with de Merode et al. (2004; Bowen-Jones 2003; and Norfolk, 2004) who also observed that rural households turn to bush meat hunting in order to supplement their livelihoods and that this increases in times of scarcity.

5.2.3 Gender and bush meat utilisation

Although some studies (Ceppi and Nielsen, 2014; Lowassa et al., 2012; Van Vliet and Nasi, 2012) observed that men are more involved in livelihoods activities than women, in this study, there were no major differences between males and females in their identification of their major livelihood activities- with farming and gardening dominating their responses. This indicates not only the limitation in practiced livelihood activities in MGMA but also a lack of rigid specialisation of labour by gender. This is noted in Table 5.5.

Table 5.5 Livelihood activities by gender

	FEMALE%	MALE%
CONVENTIONAL AND *CHITEMENE* FARMING	62.9	55.4
GARDENING	12.9	20
BEER BREWING	6.5	3.1
BUSINESS	4.8	10.8
CRAFTS	4.8	1.5
BRICKLAYING	1.6	3.1
CHARCOAL PRODUCTION	1.6	0
DOMESTICATION	1.6	4.6
EMPLOYMENT	1.6	1.5
FISH FARMING	1.6	0

Source: Field data

Even when it came to categorising livelihood activities that affect wildlife conservation, it was noted that the differences in gender responses were not mostly very significant (figure 5.9). However, the opposite was the case when it came to answers that claimed that livelihood activities did not affect wildlife conservation. Understandably, most males (19 per cent) argued that livelihood activities did not affect wildlife conservation as compared to six per cent of females because most hunting, even charcoal production and *chitemene* are done by men who were cautious about the negative effects of such activities.
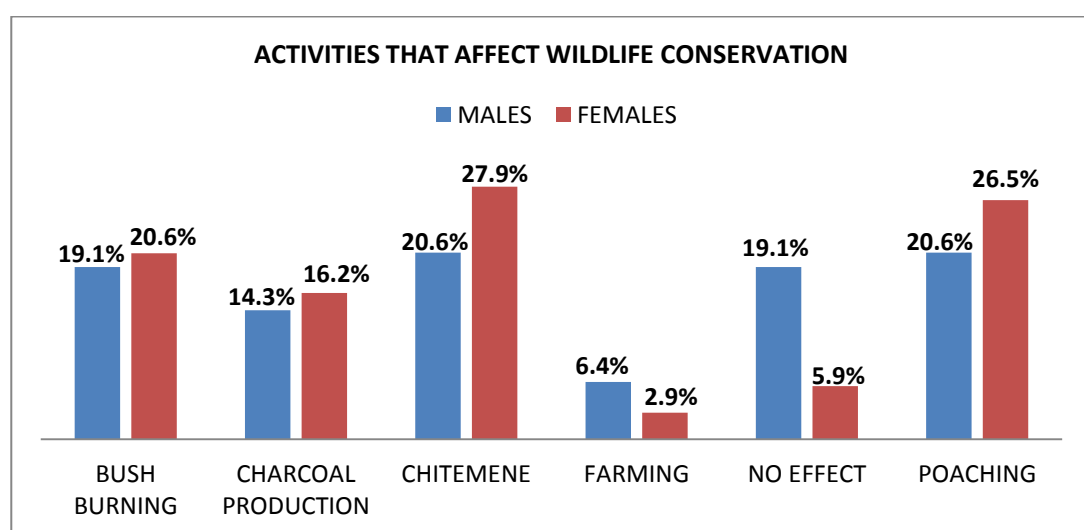

Figure 5.9 Activities that affect wildlife conservation by gender
Source: Field data

Nevertheless, the small differences in linking livelihood activities to wildlife conservation shows that even the success of livelihood activities is influenced by the relationship between male and female roles. This is in line with other studies that identify the significant role that women play even in what is seen as male activities like hunting bush meat (Ceppi and Nielsen, 2014; Lowassa et al., 2012; Van Vliet and Nasi, 2012; and Madzou and Ebanega, 2006). As such, any solutions to conservation challenges in MGMA should consider both males and females if they are to be successful.

An example from Mukungule that shows the interplay of gender roles was noted by Garoon (2009:149) that:

> [the husband] was not opposed or resistant to women's attempts to make money; in fact, he encouraged Loveness' income-generating activities, even when they took her outside of the household. Both he and Loveness told me they negotiated over how to use the money that both of them generated, and she noted that he respected her opinion on ways to earn cash - he had agreed, for example, to consider pursuing piecework in the Park the next year, and to give up hunting if he was hired.

Furthermore, the fact that male and female roles in MGMA livelihood activities are complementary also implies that not only are women able to encourage men to hunt wild animals for bush meat in order to meet their household consumption needs, but also that women can and are usually involved in processing and selling bush meat in order to meet household income needs (Amador et al., 2015; Mamadou, 2006 and Brown, 2003). As such, though men or women may not have been involved directly in identified livelihood activities, they were both able to understand the benefits and effects of various livelihood activities on wildlife conservation.

5.2.4 Diversity of livelihood activities

In order to put livelihood activities in MGMA into the context of the study, two important questions were asked. First, does diversification of rural livelihood equate to viability and what determined the choice of a livelihood activity? Second, what were the implications on wildlife conservation? Diversification or diversity of livelihoods was defined as the ability of a household to engage in different livelihood activities, while the link between livelihood activities and wildlife conservation was established only if an activity affected wildlife conservation.

A Simpson Diversity index was calculated to measure the diversity of livelihood activities in Mukungule GMA:

$$D = 1 - \left(\frac{\Sigma\, n(n-1)}{N(N-1)} \right)$$

The value of the index lies between 0 and 1; The index is zero when there is no diversification and approaches one when there is greater diversification. (Khatun and Roy, 2012). A diversity index of $D = 0.6$ was calculated (Appendix 3), indicating livelihood activities in MGMA are not highly diversified. The lack of diversity in livelihood activities in MGMA implies that some people can easily turn to hunting for bush meat because their livelihood activities cannot sustain them. This situation poses a problem for conservation because wildlife conservation seeks to reduce reliance on wildlife stocks in sustaining livelihoods. The prevalence of farming and other farming-related activities in MGMA (Tables 5.3) indicates that many other livelihood activities are often not viable. This is in line with Ellis and Allison (2004) who state that high reliance on farming as a livelihood activity

suggests failure of crops is likely to render households vulnerable to food insecurity. This is because low yields, for example, may result from a wide range of often unpredictable or uncontrollable factors, such as weather events, changes in climate, lack of farming inputs or capital, pests and diseases, lack of markets for products, poor transport for products, and wild animals damaging crops (Kangalawe et al., 2008). People generally do not rely on 'minor' livelihood activities because these usually cannot be sustained and people engage in them only occasionally to supplement their main livelihood activity. Thus, in MGMA many households survive by engaging mostly in farming activities as well as possibly a supplementary livelihood activity.

The choice of livelihood activities depends on available markets and indicates the range of options available. For example, depending on a wage or salary is rare in MGMA because there are few or no employers and therefore paid employment is usually not a feasible livelihood option. Similarly, lack of capital suggests most people cannot engage primarily in business activities to sustain themselves, while other livelihood activities such as crafts depend on tourists and other markets may be too distant for some households. Thus, the choice of a livelihood activity usually reflects local viability of the activity, and this is also the case for decisions to diversify. Therefore, as it has been noted (Anderson et al., 2011; Asmah, 2011; Demissie and Legesse, 2013), the limits in the combination of viable livelihood strategies implies that most people will continue relying on the exploitation of natural resources, which includes wildlife (Davis, 2011).

5.2.5 Access to livelihood resources and conservation

The challenge for conservation is to turn wildlife conservation into a viable land use option when rural communities opt for bush meat hunting as a livelihood activity

and an option that can compete with other livelihood activities (Nyakaana and Edroma, 2008).

More complications for conservation of wildlife arise because land, water, and forests were identified by more than 80 per cent of respondents as important livelihood resources (Table 5.6). Because land, water, and forests are also utilised by wildlife, conflict in usage can occur and this may negatively impact either on wildlife conservation or livelihood activities (Thirgood et al., 2005; Okello et al., 2014; Meguro, 2009; and Mwakatobe et al., 2014). As such, only the successful utilisation of these livelihood resources and a reduction in human-wildlife conflict may increase the success of wildlife conservation.

Table 5.6 Livelihood resources in MGMA.

Livelihood resources	Frequency	
	No.	**%**
Forests and land	54	42.5
Land and water	27	21.4
Capital	21	16.5
Land	16	12.5
Forests	7	5.5
Land and capital	2	1.6
Total(n)	**127**	**100**

Source: Field data

That is, livelihood activities can only fail to affect wildlife conservation if there is a limit or reduction in reliance on natural resources through diversification. For example, agricultural extensification requires cutting down more trees and using more water, which affects the habitat of wild animals adversely. In this sense, livelihood diversification (off the land) is generally good for both conservation and rural livelihoods because it lessens reliance on natural resources and reduces poverty.

Diversification gives individuals and families a wider choice, strengthens human capital, generates cash resources that can be used for natural resource investments, and can take pressure off sensitive natural resources by providing alternative sources of income (Ellis and Allison, 2004). However, just as Warren (2002) noted, such diversification will be difficult for people in rural areas like MGMA because any effective diversification may involve the use of natural resources.

5.2.6 Effects of Livelihood Activities on Conservation

There were ten livelihood activities identified in MGMA. From the ten livelihood activities identified in MGAMA, only three were identified as affecting conservation. *Chitemene*, charcoal production and conventional farming were identified as having negative effects on wildlife conservation because these activities involve clearing land and cutting trees. Respondents said that these activities not only left the land bare but also, especially *chitemene* and charcoal production, undermined conservation because after cutting and burning trees they take time to regenerate and thereby wildlife habitats are disturbed. The other reason why respondents said conventional farming affects wildlife was because humans usually kill wild animals when defending their crop fields. This killing of animals affects conservation by depleting populations of wildlife. Respondents stating that charcoal production impacts conservation identified disturbing the environment or shelter for animals, vegetation destruction, and leaving the land bare as the main reasons.

On the other hand, some respondents stated their livelihood activities did not affect conservation because it was wildlife that destroyed people's crop fields (Wambuguh, 2007; Chomba et al., 2012). They further stated that farming was regulated and not sufficiently extensive to affect wildlife habitats, particularly because most crop fields are small. In the same vein, others stated that even when

they killed wild animals, they did not kill enough to impact wildlife populations negatively; they generally killed few wild animals, mainly to protect their fields.

Furthermore, other respondents acknowledged that they kill wildlife to supplement their protein. Such arguments are in line with Magome and Murombedzi (2003), argued that indigenous hunting and gathering wildlife populations negatively but as they further noted, the increase in human population and advancements in technology, accelerates the depletion of wildlife stocks and loss of animal habitat. This is applicable to MGMA because the local spear has been replaced with the gun as evidenced by confiscated hunting tools and the population increases at an average rate of 3.4 per cent per annum (CSO, 2012).

5.2.7 Wildlife Conservation and Access to Livelihood Resources

Access to the resources listed in Table 5.6 is important in MGMA because it allows residents to maximise outputs from their livelihood activities. Thus, the viability of livelihood activities and the sustainability of their livelihood was linked to access to these resources. However, it was noted that conservation of wildlife also affected the livelihood activities of people in MGMA but such effect of conservation on livelihood was not sufficiently significant to upset the livelihoods of people. This assertion that there was little relationship between wildlife protection and livelihoods was confirmed by Chi-square test (x^2 = 0.197, df = 1, p= 0.6573). Furthermore, chi-square tests confirmed that there was little association between access to livelihood resources and conservation (x^2 = 0.008, df = 1, p = 0.9287) (Figure 5.10).
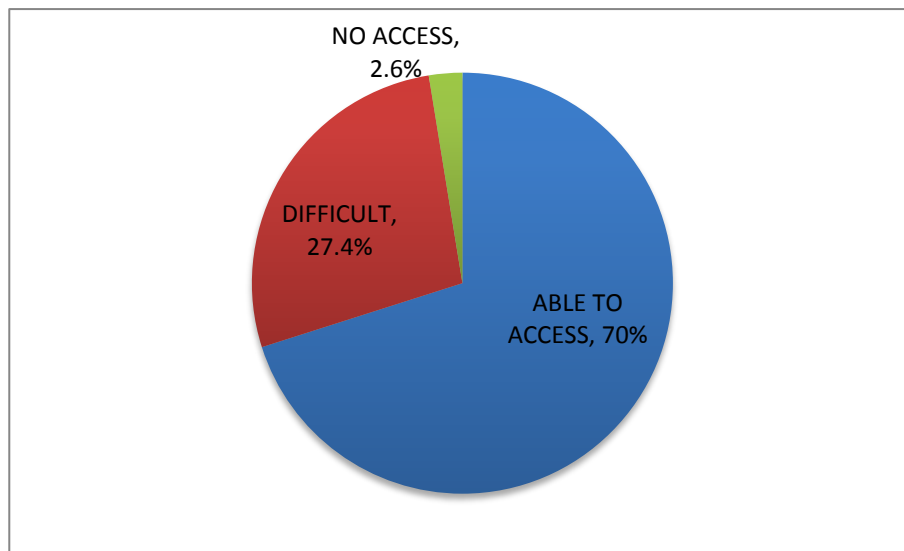
Figure 5.10 Access to livelihood resources in relation to conservation.
Source: Field data

Overall, 30 per cent of respondents said that protection of wildlife affected their access to livelihood resources. This is because protection of wildlife is not just about animals but also the environment they occupy, and people's access to resources such as water, land, and the forest is affected by the presence wildlife. For example, one informant said that even collection of mushrooms and wild fruits was dangerous because collectors often encounter wild animals.

This importance of wild products in rural areas is supported by Kalaba et al., (2009) and Legwaila et al., (2011) who noted that gathering wild products or utilising natural resources is an important livelihood activity in rural areas that contributes to sustaining livelihoods. However, it should be noted that only 2.6 per cent of respondents said they had no access, although they did not explain clearly the reasons for this. Those who found it difficult to access livelihood resources (27 per cent) were still able to access the resources required.

Therefore, not only is access to livelihood resources impacted by wildlife conservation, but also the efficient utilisation of such resources. For example, when wild animals damage crop fields, yields are often reduced and farmers respond by

building *imitanda* (makeshift houses) near their fields where they can live and guard their crops, and chase wildlife from their fields. This implies that some people do not benefit easily from the resources they access and therefore probably fail to appreciate the benefits of conserving wildlife and sometimes end up killing wild animals illegally (Gordon, 2009; Anthony et al., 2010; Goldman, 2011; and Simasiku et al., 2010).

On the other hand, the majority of respondents (70 per cent) stated wildlife conservation did not affect their access to livelihood resources. These respondents indicated wild animals were very far from them and hence their crops were not affected. However, within this group of respondents some said their access to livelihood resources was reduced because their area had few or declining livelihood resources. Reasons such as these were not connected to conservation; for example, they attributed low yields to lack of fertiliser rather than the presence of wildlife and could still access natural resources linked to wildlife conservation.

5.2.8 Alternatives to Wildlife Utilisation

In this study, a wide range of alternatives to wildlife utilisation (Figure 5.11) were identified and these shed more light on solutions to the lack of diversity in livelihood activities in MGMA.
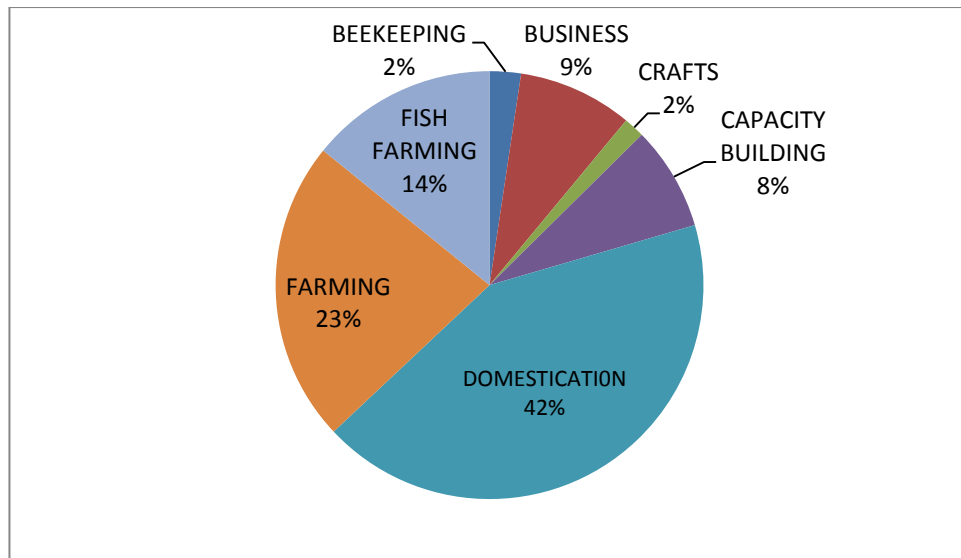
Figure 5.11 Alternatives to wildlife utilisation in MGMA.
Source: Field data

Six of the major livelihood activities identified in MGMA (Table 5.4) were also
identified as alternatives to wildlife utilisation i.e. livestock domestication, farming,
fish farming, business, gardening, and crafts. This suggests the potential of these
livelihood activities as viable for livelihoods. Domestication ranked highest because
it provides a direct alternative to hunting for meat or protein needs and, when
successful, can be a reliable source of income (Brashares et al., 2004; Tieguhong
and Zwolinski, 2009). This rationale as a source of protein also applies for fish
farming, but for farming the rationale was that respondents can improve their
experience and knowledge of environmental conditions to make farming a
sustainable source of income, thereby giving them the purchasing power to meet
their protein and other needs. That is, farming was ranked second and viewed as a
major livelihood activity as well as alternative because most respondents engaged in
farming, it was their heritage, and they understand the environment, conditions, and
climate in which they farm.

Gardening, like business, was indicated as an alternative because it is not seasonal (unlike conventional farming) and could therefore provide a steady flow of income to sustain households. It was noted that crafts and beekeeping are not practiced in many areas because the rural market is small, and knowledge and skills are limited, and hence they are not favoured alternatives (Bennett, 2002). Capacity building was a knowledge-based alternative identified by respondents because of the link between knowledge and skills to improve livelihoods, often giving individuals greater capacity to diversify their livelihood activities.

As King (2014:49) observed, alternatives that relate to income or food needs do not solve the cultural drivers of bush meat utilisation but indicates that "villages would be receptive to projects addressing these drivers." Some of the drivers of bush meat utilisation identified in MGMA (income; protein or taste; cultural aspects; HWC; lack of knowledge and poor governance) certainly have a connection to identified alternatives (farming, domestication, beekeeping, business and crafts). But what gives the alternative a high probability of success is its connection to livelihood resources utilised and livelihood activities that local people engage in.

Furthermore, although alternatives to bush meat are wide ranging and involve a variety of economic, cultural and political solutions; the common feature is that an alternative should directly address the identified drivers of bush meat utilisation (Lindsey et al., 2012; CBD, 2011; Nasi, 2008 and Kumpel, 2006). This is also confirmed by the analysis of alternatives to bush meat utilisation by age groups (Figure 5.12) which showed that all age groups identified domestication, farming and fish farming as important alternatives. This is because such alternatives directly addressed income and protein needs which had been identified as major drivers of bush meat utilisation. Furthermore, business, beekeeping and crafts were not highly

identified as alternatives to bush meat utilisation by all age groups because these presented a low probability of success. For example, business was risky for rural people with low capital; beekeeping was difficult to manage and required skills which most did not possess; while crafts required specialised knowledge and there was no ready market.

However, a successful alternative to bush meat utilisation is not as simply stated. As Pailler (2006) and Preston (2012) observe, even if it is necessary to find alternatives to bush meat utilisation, the complication stems from the effective implementation of an alternative that should not conflict with other alternatives and livelihood activities.
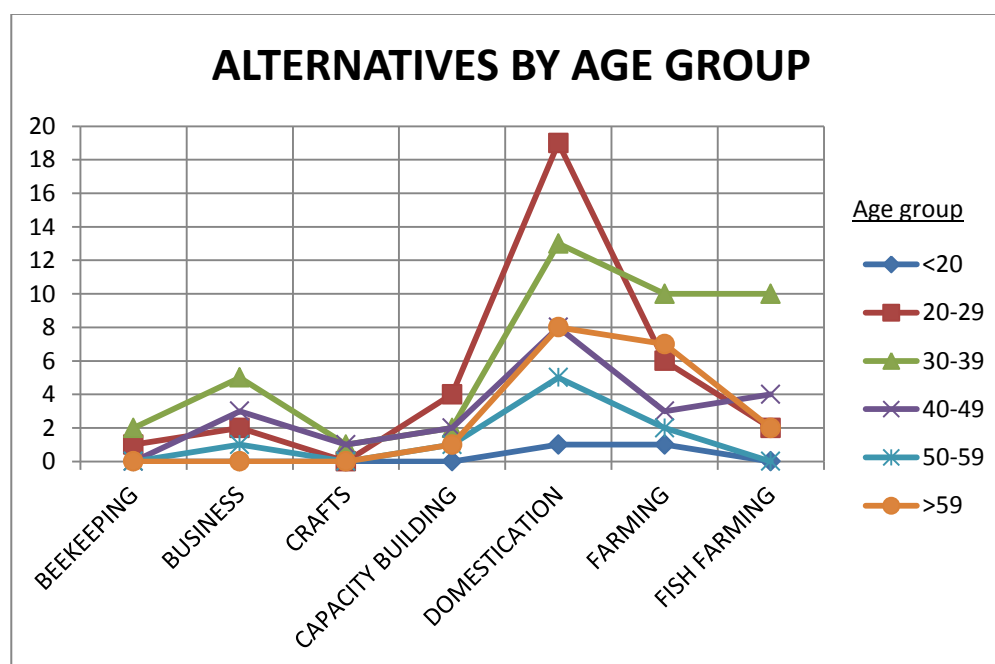
Figure 5.12: Alternatives by age group

5.3 WILDLIFE MANAGEMENT POLICIES AND RURAL LIVELIHOOD

5.3.1 Wildlife Management in MGMA

It should be noted that managing GMAs through CRBs has not been very successful. This is largely because CRBs usually have little or no technical capacity to perform their duties and recruiting qualified workers has been difficult because CRBs cannot afford to pay wages (Simasiku et al*.,* 2008). As such CRBs are frequently weak institutions which find it difficult to finance conservation programmes and relatively few CRBs have managed to negotiate successful long-term agreements with companies in wildlife ventures (Simasiku et al., 2008).

Nevertheless, in this study, the role of government in managing wildlife was recognized as important by many respondents (Table 5.7), who stated that ZAWA should continue being involved in managing wildlife; 28.2 per cent of respondents also said the community is important and should be involved in managing wildlife because the community was directly affected by wildlife. NGOs were recognised by 10.4 per cent of respondents as institutions that are intended to be involved in managing wildlife, in addition to CRBs and village leaders (10 per cent and 6.6 per cent of respondents, respectively).

Table 5.7 Groups to be involved in wildlife management**.**

PROPOSED GROUP	Frequency of nomination	
	No.	**(%)**
ZAWA	108	44.8
Community	68	28.2
NGO	24	10.4
CRB	25	10.0
Village leaders	16	6.6
Total (n)	**241**	**100**

Source: Field data.

ZAWA was recognised as an important organisation in managing and conserving wildlife because of its experience and capacity or manpower. The community was identified as another important sector in managing and conserving wildlife because the people who bore the cost of living with wildlife were treated as important and therefore need to have a say in the way wildlife is managed. The community was to be involved in managing wildlife through CRBs and village leaders, who were expected to consult in their communities. NGOs were identified as key in managing and conserving wildlife because people in MGMA believe ZAWA should be checked in its operations for accountability, which NGOs may have capacity to do, and NGOs (especially non-profit organisations) can speak for the people.

ZAWA not only regulates hunting of wildlife in GMAs by issuing hunting licenses, but also facilitates formation of CRBs to allow local communities to participate in the protection of wildlife (Fernandez, 2010). Formulated under the Administrative Management Design (ADMADE) and Luangwa Integrated Resource Development Program (LIRDP), CRBs are expected to provide incentives for rural communities' participation in wildlife conservation, which in turn would promote conservation (Zulu, 2009). The operational structure of wildlife conservation in GMAs is completed by VAGs, which act at village level and report to the CRB at GMA level. The umbrella organisation for CRBs is expected to be a CBNRM forum comprising CRB representatives from different regions. However, the forum has been dormant to date because CRBs have low revenue and the anticipated donor support has typically not materialised (Simasiku et al., 2008).

What is clear about wildlife management in MGMA is that although there is no need for a complete service of the management structure, there is need for more transparency and community participation. This is in line with many CBNRMs

whose aim has been to decentralise the management of natural resources. Decentralisation, as noted by Campbell and Shackleton (2001: 88) denotes:

> a process by which bundles of entrustments(e.g. regulatory and executive powers, responsibility and authority in decision making) are transferred to local groupings (e.g. local governments or communities).

Campbell and Shackleton (2001) further note that even if the structures formed out of decentralisation may struggle for legitimacy because of old management structures; the success rates are higher in countries where the local structures have more power in the management of local resources, for example in the Democratic Republic of Congo and Cameroon (Wicander and Coad, 2015).

It should be noted that the successful integration of the community into conservation programmes depends on the structure of local communities, community needs and benefits. Thus, the successful CBNRM programme in Kenya can be used in countries where local communities have strong rights over the management of natural resources and when such management is communal; in Tanzania, the programme requires a strong NGO participation in its implementation; in Mali, the programme demonstrates that conservation programmes can be developed by listening to local people and working with them in the implementation of the developed programme; in Namibia, the programme was structured to involve, empower and benefit local communities living with wildlife; in Madagascar the shared goals of conservation organisations and local communities were identified and then local communities were involved in the management of natural resources; in Guatemala, community concerns were cardinal in developing a strong volunteer, intern and ecotourism programmes even when government agencies lacked funds; in Colombia the incentive for community participation was trade made possible by the sustainable harvesting and use of crocodiles for eggs, meat and skins; while in Nepal

community livelihood improvement initiatives were used in raising public awareness to stop poaching (Roe, 2015).

5.3.2 Improving wildlife management

Reflecting on current management of wildlife, some respondents (Table 5.8) saw a need to improve and revise wildlife management policies, while 18.6 per cent said more manpower was required. The need to involve local communities and other stakeholders accounted for 24.8 per cent of responses; 14.2 per cent of respondents perceived that conservation education for the community was required if wildlife management was to be successful. The need to impart other life skills in local people to enable them to have more alternatives for generating income was viewed as important by 16.8 per cent of respondents.

Table 5.8 Improving wildlife management.

SUGGESTED IMPROVEMENT	FREQUENCY PER SITE										Total Frequency	
	Chipundu		Kaluba		Mukungule		Mwansabamba		Nkomba/ Kakoko			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Capacity Building	5	27.8	3	15.8	2	12.5	5	18.5	4	12.1	19	16.8
Co-management	5	27.8	7	36.8	3	18.8	5	18.5	8	24.2	28	24.8
Conservation Education	3	16.7	2	10.5	2	12.5	6	22.2	3	9.1	16	14.2
Improve management Policy	4	22.2	3	15.8	5	31.3	8	29.6	9	27.3	29	25.7
More manpower	1	5.6	4	21.1	4	25.0	3	11	9	27.3	21	18.6
Total (n)	18	100	19	100	16	100	27	100	33	100	113	100

Source: Field Data

The need to improve or revise current wildlife management policies was justified by some respondents' by asserting that ZAWA used too much force in dealing with members of the community and it cared more for wildlife than people, a trend in Mukungule also observed by Garoon (2009). Respondents perceived that current wildlife management policies also should be revised because there was need for communities to be involved in managing the benefits accruing from wildlife conservation. It was also suggested that the number of people involved in managing wildlife in MGMA was relatively small given the large area they were supposed to monitor, and hence management of wildlife is often inefficient.

Furthermore, the community should be more involved (and not just on paper) in managing wildlife because they are the custodians of wildlife for future generations (Wainwright and Wehrmeyer, 1998). However, it was recognised that greater sensitization and education of the community about the value of wildlife conservation is required to improve people's valuation of wildlife. In order to integrate communities in wildlife management effectively, community education should also build the capacity of MGMA residents to diversify their livelihood activities and be less dependent on wildlife resources.

5.3.3 Wildlife management and livelihoods in MGMA

Figure 5.13 illustrates the links between GMA management, rural livelihoods, and wildlife conservation. The structure of managing MGMA has to deal with issues of equity and benefits experienced from wildlife conservation because the main aim of the management process is wildlife conservation. The impacts of management on wildlife conservation and rural livelihood activities in MGMA are diverse.

On one hand, the management process affects the sharing of benefits and determines the nature of such benefits. As such the core principles in GMA management and practice should be about equity governance and sharing of benefits, community participation, and less of a fences-and-fines approach (Mfunda et al., 2012; Kothari et al., 2013). On the other hand, the balance between rural livelihood activities and sustainable use of wildlife is key to wildlife conservation, but that balance is still affected by issues of benefits and equity which impact wildlife management.

When analysing management of MGMA, it was observed that management is done in partnership between ZAWA, the community, and other stakeholders in line with general GMA management policies. ZAWA facilitates this partnership between government and the Chief, the local people and their representatives. Benefits accruing from wildlife co-management must trickle down from ZAWA, which gives a percentage to the CRB (under the patronage of the Chief) and the CRB then determines how the remainder of the community will benefit.
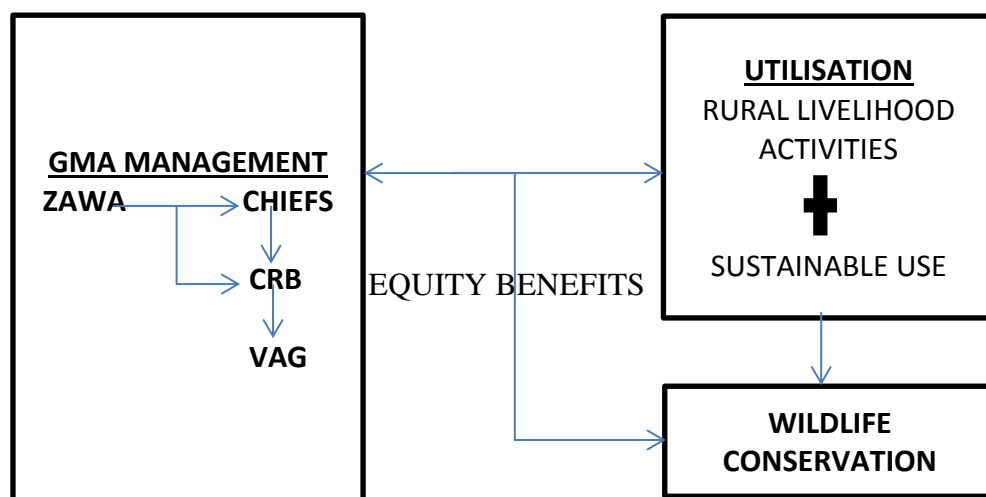

Figure 5.13 Understanding links between MGMA management, rural livelihoods, and wildlife conservation.
Source: Field Data

However, because the profits (if any) that flow to the CRB are often small, it becomes difficult for such a resource to benefit the community equitably. As Simasiku et al. (2008) observed in a general survey of the operations of GMAs, as well as Zulu (2009) in his study of Chief Mwape's CRB, inequitable distribution of profits often starts from ZAWA and affects communities adversely because typically only the community representatives gain benefits.

Although the ultimate goal of MGMA management is to balance (through sharing benefits equitably) sustainable wildlife use and rural livelihood activities in order to conserve wildlife, this is often not the case in MGMA because management policies and other conservation programmes are usually not designed by the local people (Crober, 1999; CBD, 2004; Shepherd, 2008). The inability of VAGs to design and implement conservation programmes in line with local needs (due to limited technical and financial capacity) implies that management policies are usually not localised (Wainwright and Wehrmeyer, 1998).

Furthermore, although management has been decentralised to the village level, VAGs and CRBs are largely auxiliary. This is because the operations of VAGs and CRBs are subordinate to ZAWA operations, reducing their perceived legitimacy. VAGs and CRBs may therefore become inefficient or ad hoc institutions in conservation of wildlife, making the partnership between the community and ZAWA less productive than it should be.

Links between management policy and wildlife conservation are issues of equity and benefits are often severed by a lack of balance between the costs and benefits of conservation. ZAWA's lack of a compensation policy in cases of HWC allows costs to outweigh benefits, and victims of HWC can be affected in the short and long

terms. Because MGMA is not run on economic terms, less value is created than required to make livelihood activities more valuable. That is, there are few economic opportunities to make livelihood activities more profitable, which can increase conflict over access to livelihood resources. This was noted by Garoon (2009: 106), who wrote that in Mukungule "most disputes are over access to other means of living" not over land or wildlife. Therefore for most residents whose livelihood activities are not dependent on wildlife, conservation is not as valuable as their livelihood activities.

The other link of GMA management policy to rural livelihood activities is that although conservation is prioritised in GMA management, it is also equated to protectionism. Restricting access to and usage of wildlife becomes incompatible with CBNRM when it is done with little or no regard for local consultation or cooperation, and historically this has been reflected in MGMA where success in conservation has rarely been attributed to community-based actions (Garoon, 2009). In this way, the balance between conservation policy and rural livelihood activity has not been achieved. Conservation should not be simplified to only protection of wildlife but must be flexible enough to meet community needs; otherwise VAGs and CRB become non-functional.

On the other hand, GMA policy not only impacts rural livelihood activities and conservation, but rural livelihoods also impact conservation and can render GMA management ineffective. This is because rural livelihood activities can result in unsustainable use of wildlife, impacting conservation adversely. This in turn reduces the benefits from wildlife conservation and these limited benefits are likely to be shared inequitably. Thus GMA management becomes difficult when it is too far

removed from community participation and fails to benefit local people (Udelhoven, 2006).

In the same vein, according to one key informant, although people are aware that benefits of conservation must trickle down to them to improve their livelihoods, they may experience considerable corruption or poor governance in the process. People are well aware that money generated through hunting licenses reaches the CRBs, but very few people know where the money goes. Thus, community resistance to conservation programmes may be misunderstood as hostile, but it is because they often fail to realise their share (Boyd et al., 1999; Holmes, 2013). As some respondents stated:

> "Those of us whose crops are destroyed, family members killed, those who cannot access fertilizer from the cooperatives, see nothing of that money. But we see the leaders of the CRBs eating very well, buying mattresses, and marrying many wives, because they have suddenly become rich."

In line with the above, negative perceptions about wildlife conservation were therefore common. Any negative views of ZAWA, the CRB, and their operations in the area could cast doubts about the benefits of wildlife conservation being distributed equitably into the community, particularly for those carrying higher costs of conservation such as farmers whose crops are damaged, farmers who spend time guarding their crops, or the families of those imprisoned for illegal hunting.

5.3.4 Expected benefits from wildlife conservation in MGMA

Respondents provided a broad range of answers when asked how the community should benefit from wildlife conservation (Figure 5.14). The nature of benefits identified by the community reflected people's expectations from government and the level of development in the area. Therefore, when wildlife is identified as a

resource for revenue, its management is expected to be a viable venture to solve problems faced by the community and community development linked to wildlife is to be clearly demonstrated (Kumar, 2006).

When respondents talked about sharing resources their concern was about equitable sharing of revenue from the utilisation of wildlife (Ellis and Allison, 2004; Fernandez et al., 2009b). Some respondents wanted local people to be allowed to view wildlife for free (unlike foreign tourists), get game meat intermittently as motivation, and receive capital for their businesses or cooperatives.
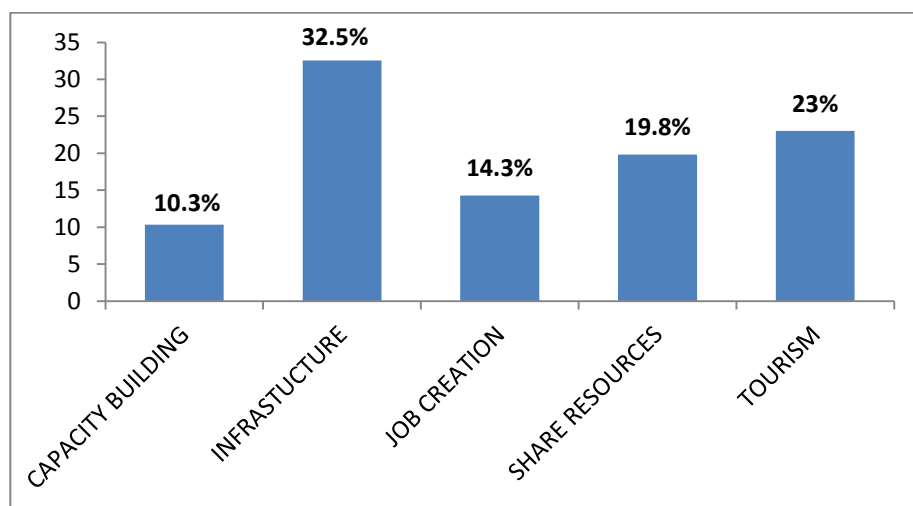
Figure 5.14 Expected benefits from wildlife conservation in MGMA.
Source: Field data

In terms of infrastructure, respondents stated that roads, schools, bridges, and clinics needed to be built in order to improve peoples' lives. Tourism in the area should also be developed to improve it as a source of revenue for local people. Respondents also noted that members of the community needed to be empowered with skills that could be used to improve their livelihood activities, while more job opportunities needed to be created

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The complexity of studying wildlife utilisation in connection with rural livelihood lies not only in the sensitivity of the research but also in its wider link to important social, political, and economic factors in people's lives. The politics of wildlife utilisation in a GMA are intertwined with social networks and poverty. Again, discussing rural livelihood is not only inter-connected to issues of poverty and development but also the political structures (local and national government) which govern rural areas. Thus both wildlife utilisation and rural livelihood evolve around the complex moral questions that sometimes people fail to ask and answer.

It was noted that drivers of bush meat utilisation (such as poverty, culture, misapplication of traditional knowledge, or poor game management) reflected deficiencies in livelihood activities in which MGMA residents engaged in as well as misapplication of indigenous knowledge and skills. Deficiencies in livelihood activities were the lack of income diversity, rendering households vulnerable to food insecurity, while indigenous knowledge and skills were misapplied in illegal harvesting of wildlife rather than wildlife conservation.

It was therefore asked: how can wildlife be conserved without disturbing the ability of rural communities to sustain their livelihoods? In response, it was also noted that community participation needed to be integrated fully into GMA management policies and practice. Although benefits of conservation are not a panacea for rural livelihood problems, some transparency and equity in the distribution of benefits would impact positively on peoples' understanding of the conservation process and

value of wildlife, and improve community relations with ZAWA to facilitate more effective wildlife management.

6.2 RECOMMENDATIONS

The following recommendations are drawn from this study to achieve a productive balance between wildlife utilisation and rural livelihoods in MGMA:

1. Capacity building is warranted to provide positive outlets for acquired knowledge and skills, and these should rely less on natural resource utilisation.

2. People's access to markets for their goods should be improved. If government creates viable outlets for products in the GMA, it would create value for people's inputs and increase their income.

3. Community education about the relevance and benefits of living with wildlife, as well as the use of natural resources sustainably, should be broadened to increase the community's understanding and appreciation of wildlife.

4. There is need to improve access to farming inputs, amenities such as schools and hospitals, and good roads in order to improve people's livelihoods.

5. The community's knowledge, needs, and values should be taken into account when designing localised conservation programmes to be run at community level under the direction of ZAWA and other wildlife conservation organisations.

6. Traditional structures should be used as community institutions for governance of the wildlife resources in the rural societies in the MGMA.

6.3 FUTURE RESEARCH

1. The behaviour and wildlife conservation perceptions of people (especially poachers) in GMAS need to be understood. This can help in formulating programmes that account for the needs of both poachers and wildlife conservation.

2. Research should be conducted to produce an inventory and evaluation of wildlife utilisation in Mukungule GMA. This could include an off-take study to determine rates of wildlife utilisation.

3. Wildlife management policies and methods of community participation should be assessed to understand the best ways to integrate ecosystem principles of wildlife conservation.

4. The viability of livelihood activities in MGMA needs to be assessed and find ways of improving such activities, and make it less dependent on wildlife resources.

5. The anthropological study of the subsistence hunters in MGMA will assist in the understanding of the persistence of traditional hunting in rural societies.

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INTERVIEW SCHEDULE

HOUSEHOLD/RESPONDENT NO.: ☐

DATE_____/_____/_____

NAME OF VILLAGE_____

GENDER: MALE ( )   FEMALE ( )

AGE CATEGORY: <20   20-29   30-39   40-49   50-59   >59

DRIVERS OF WILDLIFE UTILISATION

1. Why do you think people hunt wildlife?

_____

_____

2. Why do you think wildlife should be conserved?

_____

_____

_____

3. Does using wildlife affect conservation?

     yes ( )   no ( )

If yes, how?

_____

_____

If no, why not?

_____

_____

4. Does bush meat consumption affect conservation?

Yes( )   no ( )

If yes, how?

_____

_____

If no, why not?

_____

_____

LIVELIHOOD STRATEGIES AND WILDLIFE CONSERVATION

5. Do you think livelihood activities (livelihood strategies) affect wildlife conservation? Yes ( )   no ( )

If yes, which things?

_____

_____

If no, why not?

_____
_____

6. How can local people benefit from wildlife conservation?

_____
_____

7. What other activities do you do for your livelihood?

_____
_____

8. Which livelihood activity is most important to you?

_____
_____

WILDLIFE MANAGEMENT POLICY AND RURAL LIVELIHOOD

9. What livelihood resources are important for your survival?

_____
_____

10. Does protection of wildlife affect your livelihood?

     yes ( )   no ( )

If yes, how?

_____
_____

If no, why not?

_____
_____

11. Does protection of wildlife affect your access to resources for your livelihood?

     Yes ( )   no ( )

If yes, how?

_____
_____

If no, why not?

_____
_____

12. Has your access to resources for livelihood changed over the past years?

Yes ( )   no ( )

If yes, how?

_____
_____

13. What alternatives can people resort to when there is no bush meat?

_____
_____

14. Who do you think should be involved in protecting wildlife?

    1._____

    2._____

    3._____

    4._____

15. For each of the above, why should these be involved in protecting wildlife?

    1._____

    _____

    2._____

    _____

    3._____

    _____

    4._____

    _____

16. Do you have suggestions for how wildlife should be managed to help your livelihood?

_____
_____

Thank you very much for your time!

APPENDIX 2

INTERVIEW SCHEDULE FOR KEY INFORMANTS

INFORMANT NO. ☐

DATE_____

TITLE/POSITION_____

1. Have you been involved in wildlife conservation?

2. For how long have been involved in wildlife conservation?
_____
_____

3. What are some challenges experienced in wildlife management?
_____
_____

4. How have these been handled?
_____
_____

5. Does game management policy addresses these challenges?
_____
_____

6. Is there need for improvement in game management policy?
    Yes ( )   no ( )
If yes how
_____
_____

If no, why
_____
_____

7 .do you think conservation of wildlife has been affected because of livelihood of the local people? yes ( ) no ( )
If yes,how?
_____
_____

If no, why not?
_____
_____

8. What do you think can be done to improve conservation of wildlife in protected area?

9. Do you think conservation of wildlife affect the livehood of the people? Yes ( ) no ( )
If yes how?

_____
_____

If no, why not?

_____
_____

10. What do you think can be done to improve the livelihood of the people in protected area?

_____
_____
_____

11. Have you ever experienced illegal hunting of wildlife in your area?

     Yes ( ) no ( )

If yes, how have been handling the case?

_____
_____

12. What are the alternatives to bush meat hunting in your area?

_____
_____

Thank you very much for your time!

APPENDIX 3

SIMPSON'S FORMULA USED FOR CALCULATING LIVELIHOOD ACTIVITY DIVERSITY

LIVELIHOOD ACTIVITY	NUMBER(n)	n (n-1)
FARMING	75	5550
GARDENING	21	420
BUSINESS	10	90
BEER BREWING	6	30
CRAFTS	4	12
DOMESTICATION	4	12
BRICKLAYING	3	6
EMPLOYMENT	2	2
CHARCOAL PRODUCTION	1	0
FISH FARMING	1	0
	N=127	**∑n(n1)=6122**

$$D = 1 - \left(\frac{\sum n(n-1)}{N(N-1)} \right)$$

Therefore, Simpson's Index of Diversity= 0.6

The value of the index lies between 0 and 1. The value of the index is zero when there is a complete specialization and approaches one as the level of diversification increases.

Source: Khatun, D and Roy, C. B (2012). Rural livelihood diversification in West Bengal: Determinants and constraints. *Agricultural Economics Research Review* 25 (1), 115-124.

APPENDIX 4

PHOTOGRAPHS SHOWING TYPES OF WILDLIFE UTILIZATION

A: Confiscated animal skin

B: Confiscated fresh bush meat

C: Confiscated ivory tusks

D: Confiscated dried meat