# The effects of urbanisation on non-timber forest product dependencies:

*A case study of three settlements in the Chobe district of northern Botswana*

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Masters Thesis

2015

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This thesis is presented in partial fulfilment of the requirements for the M(Phil) in Environment, Society and Sustainability degree and was supervised by Associate Professor Rachel Wynberg.

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Submitted: 16 February 2015

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# Acknowledgements

I would like to first thank my supervisor Rachel Wynberg for all of her guidance, assistance, knowledge, support and patience. It really has been the best supervisor experience. I would also like to acknowledge the NRF and DST for their funding assistance as this work is based on the research supported by the South African Research Chairs Initiative of the Department of Science and Technology and National Research Foundation of South Africa. I want to also say thank you to everyone at CARACAL who made my fieldwork in Botswana possible, easier, and lots of fun due to everyone's help, advice and logistical assistance. This includes Kathy Alexander, Mark Vandewalle, Mpho Ramotadima and Cisko Charlie. My fieldwork would also not have been as promising if it were not for the help of my translator and fieldwork assistant, Onalethuso Ntema, whose knowledge and communication was an essential part of my research project. I would like to acknowledge Serge Raemakers for his assistance with the mapping included in this thesis. I would like to thank the Chiefs of Kasane, Kazungula and Lesoma for their authorisation and involvement in this project as well as the participants of my interviews in each settlement and in each organisation I worked with. The Department of Forest and Range Resources (DFRR) supplied me with important data for which I am grateful. Finally I would like to thank my family, friends and colleagues for their support and endless encouragement.

# Summary

The aim of this study was to investigate the impacts of urbanisation on the use of, and access to, NTFPs in three settlements in the Chobe District of northern Botswana. Specific objectives were to determine the extent of NTFP use occurring in these areas; the purposes of use; the factors that influence use and access in the rural/urban context, particularly government rules and regulations; and implications for future NTFP use in this region.

Research was conducted in three settlements: Kasane, Kazungula and Lesoma. Kasane is an urban town, Kazungula is less urbanised and Lesoma is a rural village. All areas are surrounded by state-owned Forest Reserves and the Chobe National Park. The study employed both qualitative and quantitative data collection methods including household interviews (30 in Kasane, 30 in Kazungula and 25 in Lesoma), four key informant interviews, two focus groups with youth and the collection of other grey literature relating to government harvest permits and market data.

Households in all three areas used NTFPs despite the different rural and urban contexts in which they exist. Kasane and Kazungula showed a less diverse range of resource use, with fuelwood and wild foods the most commonly used resources in all three areas. These resources were used mainly for subsistence purposes. Harvest locations varied but were most commonly in and around the settlements themselves. Households in Kasane and Kazungula expressed the desire to use fewer resources in the future, mainly for conservation reasons, while those in Lesoma wished to use more. The government rules and regulations, particularly the DFRR permit system, were found to restrict resource access. Despite this, households in the more urban areas felt that the laws were necessary while those households in Lesoma thought that the laws conflicted with community livelihood needs. The majority of respondents believed conservation management to be a barrier to resource access as the presence of wild animals and anti-poaching units in the harvesting areas compromised safety. The general absence of resource commercialisation and market opportunities in the settlements, especially the urban towns of Kasane and Kazungula, were other commonly cited barriers to resource access. The perceived degradation of traditional practices due to modernity and urbanisation was evident for most households in all three areas but the actual loss of indigenous knowledge was most apparent in the urban areas.

Wider implications for this case study are the application of the findings to further research into the impacts of urbanisation. This study can add to the literature around the implementation of improved urban development strategies, including the reliance on NTFPs and declines in cultural and environmental degradation. Recommendations provided in this study include further investigations into resource use; the application of resource co-management; improved market infrastructure and the implementation of ecotourism and local craft-making projects.

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# Abbreviations

CARACAL: Centre for African Resources: Animals, Communities and Land Use

CBNRM: Community Based Natural Resource Management

CECT: Chobe Enclave Conservation Trust

CEO: Chief Executive Officer

DFRR: Department of Forest and Range Resources

CITES: Convention on International Trade in Endangered Species

GDP: Gross Domestic Product

NTFP: Non-timber Forest Product

PALEKA: Panda-Lesoma-Kazungula Trust

USA: United States of America

USAID: United States Agency for International Development

WHO: World Health Organisation

# 1. Introduction

## 1.1 *Background*

Africa has the largest proportion of the world's population living on less than a dollar a day and of its 1.1 billion inhabitants, over 65% are reliant on NTFP harvesting for subsistence use or for an alternative cash income (Timko *et al.* 2010). NTFPs afford important livelihood security for millions by providing food, income, building materials, fuel, fodder, medicines, social networks, existence values and ecological services (Shackleton *et al.* 2000; Kaimowitz 2003; Chamberlain *et al.* 2004). It is projected that the number of people in Africa living in urban areas will be around 770 million in just 15 years (McHale *et al*. 2013). Despite this, studies describing the harvesting of natural resources in urban areas remain limited especially in the Global South where the majority of urbanisation is occurring (Stoian 2005; Grimm *et al.* 2008; McHale *et al*. 2013; McLain *et al*. 2014). By disregarding the effect of urbanisation on NTFP use there can be an underestimation of the importance of these resources in the livelihoods of many poor and marginalised households in urban areas (Stoian 2005). Greater understanding of NTFP use in the urban context is necessary as it is often an important livelihood strategy, natural resources are increasingly under threat and there is a need for this understanding to be included in urban development strategies. In addition, the issues households may face in accessing these resources in the setting of global, and especially environmental, change can be more properly understood (Scoones 2009).

This study focuses on the use of and access to NTFPs by households in Kasane, Kazungula and Lesoma, settlements located in northern Botswana. Kasane and Kazungula lie adjacent to the Chobe National Park and are urbanising areas experiencing rapid development and human population increases. Despite this urbanisation and reliance on urban livelihood strategies, many households engage in rural livelihood activities including animal husbandry, crop production, fishing, and the use of forest products from the adjacent Forest Reserves. Lesoma, while also showing increases in urbanisation and population numbers, is considered a rural village yet households conduct both urban and rural activities for their everyday needs. It has been found that shifts from subsistence use of NTFPs to reliance on cash economies mean that many more households rely on both urban and rural assets to meet their livelihood needs (Shackleton *et al*. 2000). These areas provide interesting cases for investigating multi-spatial livelihood options and the use of NTFPs in a rural/urban context. The analysis of NTFP use is pivotal as these settlements are densely populated, urbanising spaces on the edge of protected areas and along the Chobe River, where tourism drives a strong market economy and there is clear evidence of a decline in natural resource abundance in the surrounding environment (Lepetu *et al.* 2012).

As well as the use of NTFPs, access to resources is an important component to this research. Household access to NTFPs can face both opportunities and barriers particularly due to government rules and regulations as well as the rural/urban context in which these households exist. Understanding these

rural-urban linkages is therefore crucial in terms of promoting the sustainable development and use of resources as it broadens the options for enhancing livelihood capabilities (Carney 1998).

### 1.2 *Relevance of this study*

The effects of urbanisation are a reality for most countries especially in the developing world (Grimm *et al*. 2008). In just 20 years, urbanisation rates more than doubled in Botswana with the percentage of the population living in urban areas increasing from around 23% to 50% (Crush *et al.* 2006). Therefore, understanding the impacts of urbanisation on NTFP use and livelihoods is relevant and important. This case study will hopefully provide some useful information and research methodology to better understand the implications of urbanisation on NTFP use and access at the community level.

Research conducted by Lepetu *et al*. (2012) investigated forest resource utilisation in Kasane, Kazungula and Lesoma, how this utilisation changed according to certain demographics and what implications this had for the management of the relevant protected areas. The study investigated the nature and demographics of resource use but did not place an emphasis on the barriers and opportunities of use faced by local communities in the context of urbanisation. This study aims to fill this research gap.

### 1.3 *Aim*

The aim of this study is to understand the effects of urbanisation on NTFP use, the types and patterns of use as well as household opportunities and barriers to access and use of NTFPs in three settlements in northern Botswana.

### 1.4 *Objectives*

- To describe what NTFPs are used in Kasane, Kazungula and Lesoma.
- To determine the purposes of NTFP use in these areas.
- To explore the factors that influence use of and access to NTFPs in the rural/urban context of each settlement.
- To determine the impact of statutory rules and regulations on the use of and access to NTFPs.
- To explore implications of these findings for future NTFP use in the Chobe region, by these three communities.

### 1.5 *Methodological approach*

This research uses case studies and has employed both qualitative and quantitative data collection. The settlements of Kasane, Kazungula and Lesoma provide the context for investigating the effects of

urbanisation on NTFP use. Kasane and Kazungula are both urban areas while Lesoma is considered rural.

Data collection was done through 85 household interviews (30 in Kasane; 30 in Kazungula; 25 in Lesoma), four key informant interviews and two focus groups. A basic market survey of Kasane was also conducted and looked at the market opportunities currently available for the commercialisation of NTFPs. Other data was obtained through the collection of the Department of Forest and Range Resources permit data in order to provide some indication of the natural resources that are being harvested under the current rules and regulations.

### 1.6 *Structure of this dissertation*

Chapter 2 reviews literature on livelihoods, NTFP use and trade, urbanisation and the rural/urban interface and resource governance in the context of Botswana. The methods (Chapter 3) describes the study area in more detail, the methodology applied to this research and the limitations that this study faced. Chapter 4 presents the results of the study. Chapter 5 places the results in the context of the wider literature and discusses the relevance of this research to the investigation of NTFP use and the effects of urbanisation. Chapter 6 concludes by providing some closing remarks about the study's findings and provides recommendations. The bibliography and appendix sections are included as supplementary documents.

# 2. Literature Review

## 2.1 *Livelihoods*

> *"A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term"* (Chambers & Conway 1992).

Livelihood investigations reveal the complex range of activities and the diversity of strategies people employ, often simultaneously, in order to make a living (Scoones 2009). In order to analyse these livelihoods, one must be aware that different strategies may often result in varying outcomes and therefore play different roles for each of the households in which they are implemented (Scoones 2009). The focus on local livelihoods should also take into account the broader aspects of livelihood approaches such as geographical location and the economic structures and political processes that describe a households' opportunities and constraints, with a particular focus on vulnerability and resilience thinking (Scoones 2009; Timko *et al.* 2010). Another aspect of understanding livelihoods perspectives is how livelihood strategies are employed based on gender, age, ethnicity, cultural background, location, economic standing and religion (Scoones 2009).

The literature surrounding livelihoods incorporates development thinking which has grown to include the notions of equity, capability and sustainability (Chambers & Conway 1992). Equity, in this context, is the fair distribution of assets, capabilities and opportunities (Chambers & Conway 1992). Capability is seen as the ability to perform basic functions that then make a person capable of doing, and being a certain way and choosing certain livelihoods (Chambers & Conway 1992; Sen 2005). These capabilities are provided to people through the different assets that they might have where these assets do not only allow for survival and poverty alleviation but also give people the agency, and power, to challenge or change the structures and processes in which they are living in order to improve all aspects of their livelihoods, where human capital is of key importance (Bebbington 1999; Sen 2005). This idea of capabilities is also prevalent, and perhaps needed, in the current face of global environmental change where adaptable capabilities can help to exploit new opportunities be these environmental, financial or social sustainability (Chambers & Conway 1992; Scoones 2009). Sustainability is the ability to maintain and improve livelihoods, over the long-term, by maintaining or improving the local and global assets and capabilities on which these livelihoods depend (Chambers & Conway 1992). The term sustainable means that livelihoods should be "stable, durable, resilient and robust in the face of both external shocks and internal stresses" (Scoones 2009). In order for sustainability to be achieved there needs to be a thorough understanding of the trade-offs between economic growth, social development and

environmental health where natural capital is as important as other assets (Bebbington 1999; Folke *et al.* 2002). Natural capital is found through ecosystem services such as clean water, unpolluted air, fuel and food needed for household security and survival (Folke *et al.* 2002). Through unsustainable management, these ecosystem services can be severely compromised with a subsequent loss of ecosystem resilience and an increase in vulnerability which could negatively affect livelihoods (Folke *et al.* 2002). Therefore in order for livelihoods to be sustainable, the environmental integrity on which many livelihoods often depend needs to be maintained. Adaptability, and ultimately sustainability, is largely reliant on the way in which societies manage the resilience of ecosystems where resilience is defined as "the capacity of a system to absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks" (Walker *et al.* 2004). The resilience of an ecosystem is often closely linked to its biodiversity, including species diversity, human opportunity and economic options (Folke *et al.* 2002).

### 2.2 *NTFP use and trade*

NTFPs offer an important security for millions throughout the world by providing food, income, building materials, fuel, fodder, domestic utensils, agricultural implements and medicines (Kaimowitz 2003; Chamberlain *et al.* 2004). NTFPs may also have equally important, non-monetised value such as the maintenance of social networks, aesthetics, shade, existence values, use as sacred areas and ecological services (Shackleton *et al.* 2000). The use of NTFPs shows great variation from place to place due to a range of factors including resource accessibility, resource availability, population numbers, institutional controls, employment status, income levels, access to alternatives and cultural and personal preferences (Shackleton *et al*. 2001). Fuelwood accounts for one of the major forest products harvested as it is a main energy source and is therefore important to many households and their livelihoods, especially those in more marginalised communities (Dovie *et al*. 2004). Any decrease in the availability of, or access to, fuelwood could mean that many households are left vulnerable to livelihood insecurity (Dovie *et al.* 2004). The decision by many households to use fuelwood as their main source of energy is made based on a range of factors including time and labour allocation and management of other livelihood strategies (Dovie *et al*. 2004). Non-timber forest products (NTFPs) also include a wide range of natural resources that are utilised. NTFPs are defined as "plants, parts of plants, fungi, and other biological material that are harvested from within and on the edges of natural, manipulated or disturbed forests" (Chamberlain *et al.* 2004). The use of NTFPs has occurred for many centuries in most areas of the world and their use today often provides an important source of food for many households, especially those in rural areas (Chamberlain *et al.* 2004). The harvesting and subsequent use of NTFPs occurs over a wide range of ecological, social, economic and geographical settings (Chamberlain *et al*. 2004). For the most part, harvested NTFPs are consumed, or used, directly by the people that have harvested them or are traded in small quantities as an alternative source of household income (Belcher *et al.* 2005). Many products are low-cost and easily available for harvesting

as they are common property, or open access, resources that can be used with very little need of processing (Kaimowitz 2003; Belcher *et al.* 2005). They are also directly available when household shocks occur such as crop failure, drought, death and disease (Belcher *et al.* 2005).

Although both men and women are often dependent on the environment for forest resource use, in many cases the manner in which men and women harvest and use these resources differs (Lepetu *et al.* 2012). Therefore it is important to try and understand the gender dynamics of resource use in order to know where and how policies should be implemented and who should be targeted by certain management strategies. It is also often necessary to distinguish between those households that rely on natural resources for an 'emergency net function' and those that use them as a 'daily net function' (Timko *et al.* 2010). The use of NTFPs can also vary from season to season, depending on changing household needs (Timko *et al.* 2010). Shackleton *et al*. (2007) found that the use of NTFPs can contribute between one quarter and one sixth of total livelihood income streams either through direct use or through income generation. A global study conducted by Angelsen *et al*. (2015) found that in Africa, forest income accounts for 21.4% of average household total income. The ability to use natural resources for daily needs means that scarce cash resources can be saved and so allow for the accretion of assets necessary for a more secure livelihood (Shackleton *et al*. 2007). The use of NTFPs also means that the government has to spend less on supplying daily household needs suggesting government should have an interest in ensuring the continued use and sustainability of these resources (Shackleton *et al*. 2007).

Despite research having shown that the harvesting of NTFPs is a valuable endeavour, both socially and economically, this is rarely incorporated into development planning or Gross Domestic Product analyses (Chamberlain *et al.* 2004). The revenue generated from the use and sale of many NTFPs is thus often not recognised, or accounted for, in the formal sector (Dovie 2003). In many cases, the direct value that is gained from land-based activities such as animal husbandry, arable production and the harvest of natural resources is discounted which often means that communal, rural areas continue to be perceived as unproductive with little contribution to the national economy (Shackleton *et al.* 2001). The high diversity of resources that are used also often means that there is little known about the biology of the harvested species and the ways in which they are harvested (Chamberlain *et al.* 2004). Therefore, due to the broad spectrum of NTFP use, analyses and policies that focus on this use should be context-specific and applicable to a certain locale, or community (Chamberlain *et al.* 2004). Research into the harvesting, use and sometimes trade of NTFPs can be useful when developing policies, development management strategies and conservation objectives (Chamberlain *et al.* 2004).

The commercialisation of naturally harvested resources has been considered an important factor in rural development and the improvement of household income and livelihoods (Belcher *et al.* 2005). The underlying assumptions regarding NTFPs are that they are accessible to rural households, especially the rural poor; that harvesting is more environmentally benevolent than for example timber harvesting; and that the more valuable a resource is to a local population, the more it will be conserved (Belcher *et al.*

2005). The trade of NTFPs in local, regional and even international markets is often seen as a substantial enterprise for many households and is important if households are to find a way out of poverty and subsistence use (Belcher *et al.* 2005). The key difference between trading in NTFPs and agricultural products is that NTFPs are harvested from wild areas that are often relatively far away and may be areas over which the harvester has no secure tenure (Belcher & Schreckenberg 2007). However there are also many market inefficiencies associated with products that are harvested and traded in small amounts as is often the case with NTFPs (Belcher & Schreckenberg 2007). Successful trade also requires a minimum skill set which poor people do not often have (Belcher & Schreckenberg 2007).

Although there have been high expectations that the commercialisation of NTFPs can be an important principal source of household income, studies have shown that in many cases trade in these products only contributes a relatively small proportion of total household revenue (Belcher *et al.* 2005). There is also evidence that many of the natural resources that are harvested from communal areas in southern Africa are being harvested at unsustainable levels (Dovie 2003). The sustainability of resources is determined both by the nature of the resource and its ecological characteristics and by the harvesting practices of the people using them (Matsa & Mutekwa 2009). Tenure is also an important factor. Where there is open access to a particular resource there is often over-harvesting of the resource (Belcher *et al.* 2005). There are already large pressures on natural resources due to anthropogenic and land-use changes but growing urbanisation and populations, as well as improved markets, mean that these pressures are increasing (Chamberlain *et al.* 2004). Therefore, any aims to improve livelihoods based on NTFP use must take into account the sustainability of this resource base and the structures and processes that are in place to manage them. Another issue that needs to be addressed is the balance between conservation and human development. People's use of, and access to, natural resources is often in contest with many conservation objectives (Salafsky & Wollenberg 2000). This may cause conflict as many protected, 'no access' areas such as national parks, are in direct contestation with local livelihoods and their adopted strategies (Salafsky & Wollenberg 2000). It has been noted by Belcher *et al.* (2005) that although NTFP harvesting is an important livelihood diversification strategy, it could be wrong to assume that any efforts to develop resource trade to help benefit poor households will be effective. This is because there may be major constraints that these households face that make it very difficult for them to move beyond wild gathering of these resources.

### 2.3 *Urbanisation and change along the rural-urban continuum*

Over 95% of the increase in the world's population is likely to be in urban areas (Grimm *et al*. 2008). It is also estimated that by 2030 the number of people in Africa living in urban areas will be around 770 million (McHale *et al*. 2013). Yet studies to understand the harvesting of NTFPs in urban areas remain limited (McLain *et al*. 2014). Also, the majority of research done on urbanisation processes, and the impacts on livelihoods, has been conducted in large cities but little has been done with regards to small and mid-sized cities (Schlesinger *et al*. 2015). In 2010, it was found that there were more people living

in small to mid-sized cities than in large ones, around Africa (Schlesinger *et al*. 2015). Therefore, it is important to try and understand the changes in resource utilisation that arise due to urbanisation in these smaller cities (McHale *et al*. 2013).

Some of the major drivers of global urban expansion include increasing population growth, greater per capita incomes, efficient transport, cheaper agricultural plots and the proliferation of informal settlements (Angel *et al*. 2011). People tend to leave rural areas due to declines in agricultural production, lack of employment and poor access to basic infrastructure but these developments are often not realised in the urban context and so poverty in these urban areas grows (Malimbwi *et al*. 2010). Urban areas are also increasingly encroaching on natural habitats with negative environmental impacts (Pickett *et al*. 2001). Urbanisation has led to widespread environmental fragmentation and devastation which means that many ecosystems in urban areas have been degraded or destroyed (Wehi & Wehi 2009). It has been found that urban developments can lead to serious local extinctions and eradication of the majority of native species (McKinney 2002; Alberti *et al*. 2003). Activities associated with human populations drastically affect natural ecosystems through land conversion, resource consumption, changes in habitats and species compositions and modification of nutrient cycles and hydrological and energy flow processes and this occurs most often in and around urban areas (Alberti *et al*. 2003). This can be seen in the fact that more than half of the earth's forests have been lost due to human activity (Alberti *et al*. 2003). However, studies on the impacts of urbanisation on socioecological factors such as NTFP use remain limited particularly in developing countries in the Global South where these changes will be the most felt as this is where the biggest growth in both urban settlements and populations is going to be (Stoian 2005; Grimm *et al.* 2008; McHale *et al*. 2013). Such studies are imperative to help attain a sustainable future (McHale *et* al. 2013).

With increasing urbanisation, and shifts from subsistence use to cash economies, many more households rely on both urban and rural assets to meet their livelihood needs. Most households in southern Africa, for example, rely on a range of activities and income sources that draw on both rural and urban resources (Shackleton *et al.* 2000). In many instances, rural activities, such as farming and plant harvesting, are taking place in urban areas and more urban activities are taking place in rural areas with households becoming increasingly multi-spatial (Tacoli 1998). Therefore it could be more useful to look at the 'rural-urban continuum' where there is no distinction between urban and rural as people are relying on the same resources for their daily needs (Stoian 2005; McHale e*t al*. 2013). Although the use of NTFPs is not a new occurrence, it has mostly been investigated in relation to rural livelihoods rather than as a part of dynamic, urban landscapes (Schlesinger *et al*. 2015). NTFPs have a close relationship with culture, identity and enhanced social capital and these can often form a significant role in the rural-urban link (Shackleton & Gumbo 2010). Urbanisation has, however, led to the displacement of many people from the resources they would traditionally use and so traditional knowledge tends to be diminished, especially among younger generations (Wehi & Wehi 2009). Understanding these rural-

urban linkages is useful for promoting development as well as the sustainable use of natural resources as it widens the choice for enhancing livelihood options that are based on both rural and urban activities and resources (Carney 1998).

One of the key impacts of urbanisation is the increased reliance on purchased foods (Schlesinger *et al*. 2015). Neoliberal and colonial food economies have created socially and environmentally detrimental situations therefore localised food production and sovereignty, such as urban harvesting, can provide a useful and necessary alternative to these scenarios (Poe *et al*. 2013). A further lack of access to productive resources (e.g. agricultural land and livestock), in urban areas, means that the harvesting of wild resources is an appealing alternative (Schlesinger *et al*. 2015). NTFPs that can be harvested in urban areas include wild plants, "feral" plants and domestic plants that can be indigenous, non-indigenous, invasive or non-invasive (McLain *et al*. 2014). It has been noted that people who harvest NTFPs in urban areas have diverse access strategies ranging from formal to informal to non-sanctioned methods of access (McLain *et al*. 2014). These NTFPs can be harvested from a diverse range of urban habitats and can serve as food, medicines, arts and crafts, fuel and construction materials (Poe *et al*. 2013). Urban harvesting encounters issues around land tenure, access and environmental management, all of which are novel issues to urban political ecology (McLain *et al*. 2014). The practice of urban harvesting is another example of how the previously entrenched distinctions between urban and rural practices are being challenged (McLain *et al*. 2014). By looking at the ways in which people harvest in urban areas, new sociological insights into urban ecology and green space management can be identified (McLain *et al*. 2014). Urban green space planning could well benefit from incorporating more effective relationships between people and the environment (McLain *et al*. 2014). Preventing access to areas where natural resources can be harvested for the purpose of amenities and recreational uses is giving privilege to only a narrow set of services and values that urban green spaces have to offer (Poe *et al*. 2013). Some of the challenges that this kind of green space management could face are that densely populated urban areas could lead to increased harvesting pressures on resources (McLain *et al*. 2014). In some areas, particularly in the USA and Europe, urban fruit harvesting is gaining legitimacy as both a local food production strategy and as a food security option for lower income households (Łuczaj *et al*. 2012; McLain *et al*. 2014). In Seattle there are many people who harvest wild berries, weeds, edible mushrooms and fallen branches for subsistence reasons, for cultural purposes and to generally enhance their quality of life (Poe *et al*. 2013). In Cape Town, most urban harvesters are small-scale, informal, commercial workers who try to meet the ever-changing demands for natural harvested products and their occupation is mostly justified by culture but also comprises an important source of cash income (Petersen *et al*. 2012).

### 2.4 *NTFP governance*

Resource governance "takes into account the different actors and networks that help formulate and implement environmental policy and, or, policy instruments" (Pahl-Wostl 2009). Resource

management, in contrast, "refers to the activities of analysing and monitoring, developing and implementing measures to keep the state of a resource within desirable bounds" (Pahl-Wostl 2009). Some of the most pressing challenges that face national governments with regards to natural resource regulations are to enhance local people's rights and capacity and local decision-making; to reduce the vulnerability of poor people; and to enable market opportunities for these poor people (Mayers & Vermeulen 2002). However resource governance is often disadvantaged, especially in developing countries, by corruption, an absence of civil society and a lack of effective institutions and governance systems (Pahl-Wostl 2009).

NTFPs are harvested from many different kinds of land tenure such as private, communal, tribal and state land, and are accessed under a range of regulations, from no-access zones to open access areas (Laird *et al*. 2010). The regulations that govern NTFP use and access usually include "approved harvest methods, the maximum amount of material to be harvested, the location of harvests and procedures for obtaining access" (Pierce & Bürgener 2010). These use and access regulations are important because they mostly affect harvesters at the beginning of the supply chain (Pierce & Bürgener 2010). It is often the case that the restrictions placed on poorer household's use of resources, especially for subsistence harvesting, are quite strict while those for more dominant interests, like commercial harvesting, are less controlled (Mayers & Vermeulen 2002; Pierce & Bürgener 2010). Statutory control over NTFPS can be metered out in various ways such as nationalising the trade, controlling access to state land and licensing harvesters through permits, which is a common control measure. However, all of these regulations have proved to be unsuitable for the complex nature of the NTFP sector (Laird *et al*. 2010; Pierce & Bürgener 2010). Another reason that NTFP regulation is often difficult is because there is such a range of species that are used, all with different ecologies, livelihood roles and market chains (Laird *et al*. 2010).

In many parts of Africa, the introduction of modern government and private property management systems have not incorporated the local, typically complex, common property resource use practices and management systems that are present amongst many rural communities (Matsa & Mutekwa 2009). Traditional conservation strategies, if they were present, have been eroded by increased demands for NTFPs, greater reliance on the cash economy, changing cultural beliefs and external pressures leading to environmental decline (Chamberlain *et al.* 2004). The sustainability of these traditional knowledge systems has been placed under further pressure from exponential population growth, urbanisation and migration (Lepetu *et al.* 2012). It is also often the case that the rules around natural resource use followed by local residents (in tribes, families and villages) are those that influence resource conservation rather than the officially designated regulations (Hayes 2006; Pierce & Bürgener 2010). In many areas, the hierarchical, top-down, biologically-focused and technocratic approach to conservation and natural resource management has resulted in social conflict that threatens the natural resources themselves (Matsa & Mutekwa 2009; Lepetu *et al.* 2012). As these natural resources are then

depleted and as populations in an area grow these conflicts tend to intensify (Matsa & Mutekwa 2009). Tension between government and local residents has also arisen when residents have been denied access to protected areas and decision-making (Hayes 2006). Yet no-access protected areas have been found to be a flawed policy measure for good conservation (Hayes 2006).

Sometimes, the rules that govern NTFP use have been made in an opportunistic or reactive way with little knowledge of the complex nature of NTFP use. This means that these regulations may be erratic and poorly coordinated (Laird *et al*. 2010). Little research has been done on NTFPs and how they relate to livelihoods when rules and regulations are implemented (Laird *et al*. 2010). In most cases harvesters have very little say in policy decision-making as they are usually the least influential members of society and there are very few organisational or institutional avenues for them to express their views (Laird *et al*. 2010). If local residents are denied involvement in decision-making processes then these processes cannot benefit from indigenous knowledge that might be valuable to use and management systems (Hayes 2006). Therefore, consultations with the interested parties should be carried out so that effective policies are developed that address user needs and concerns (Laird *et al*. 2010). Clear resource and land ownership and usage rights can also help local communities to protect resources and improve local livelihood security (Mayers & Vermeulen 2002).

### 2.5 *Botswana as a case study*

Botswana became an independent state on the 30th September 1966 (Wiseman 1992). At independence, it was one of the "poorest and least-developed states in the world" yet within 20 years it became a "stable and democratic state with the fastest rate of economic growth in the world" (Wiseman 1992). At the time of independence, the country's economy was based on agriculture and migrant labour but these were both precarious industries in the long-term economic growth of the country (Wiseman 1992).The massive increase in economic growth has thus been mainly due to mineral extraction, particularly diamonds, and this is still the largest contributor to GDP today. The rapid growth in the economy saw a huge increase in social and physical infrastructure (Wiseman 1992). The country has also been able to provide health, education and social security to its people and this has created a minimum level of welfare (Blaikie 2006). Despite this, unemployment and rural poverty are still quite high (Blaikie 2006). Botswana has relatively low 'population-land resource ratios' therefore the government, since the 1980s, has endeavoured to decentralise the management of natural resources (Blaikie 2006). This has been done in many instances through the establishment of community-based natural resource management (CBNRM) initiatives which were set up in 1988 with the help of USAID (Blaikie 2006). These initiatives were established to focus mainly on wildlife and tourism management (Blaikie 2006). CBNRM, through Community Trusts, facilitate community participation in conservation as well as tourism development (Mbaiwa 2011). However, many of the CBNRM programmes have failed to deliver in terms of their stated aims (Blaikie 2006).

The total population of Botswana in 2011 was 2024 904 people (Statistics Botswana 2014). Non-citizens account for 3% of the population (Central Statistics Office 2009). In 2006, 35% of the country's population was under the age of 15, 60% was between the ages of 15 and 64 and 5% was over the age of 64 (Central Statistics Office 2009). Seventy six percent of the population have reached either primary or secondary levels of schooling while 22% of the population have never attended school (Central Statistics Office 2009). Ninety percent of the population are either Christians or have 'God' as their religion (Central Statistics Office 2009). As of 2006, the average household size in Botswana was 4.2 people with 53% of the household heads being male and 46.6% female (Central Statistics Office 2009). For many households wood is the main source of energy (Central Statistics Office 2004). Twenty percent of urban households and 76% of rural households depend on wood for cooking while 30% of urban households and 78% of rural households depend on wood for heating (Statistics Botswana 2014). In 2011, 13% of houses were traditional houses, declining from 22% in 2001 (Statistics Botswana 2014). From the period 1982 to 2003, urbanisation rates more than doubled in Botswana with the percentage of the population living in urban areas increasing from 23% to 50% (Crush *et al.* 2006). According to the Central Statistics Office, the population of the Chobe District in 1991 was 14 126 people, growing to 23 374 people in 2011. This shows a 65% increase in the population over a 20 year period. The population of Kasane in 1991 was 4 336 people, growing to 9 250 people in 2012, a 113% increase over a 21 year period (www.cso.gov.bw; www.mongabay.com). Along with this, the number of urban settlements in Kasane grew from 4 300 to 7 006 in 2001 (www.cso.gov.bw). The population of Kazungula was 757 in 1991 and in 2014 was 4 133 people (www.cso.gov.bw), a growth of 445% in 23 years. The population of Lesoma, in 2001, was 454 people and is currently 613 showing only a 26% increase (www.cso.gov.bw). These figures provide some insight into the rapid urbanisation that has occurred in Kasane and Kazungula as opposed to the relatively slower population growth occurring in the rural village of Lesoma. These three settlements therefore provide an interesting perspective for investigating multi-spatial livelihoods and the effects that urbanisation might have on NTFP utilisation.

Botswana is a large country that is mostly flat and has a population that is very unevenly distributed, mainly due to the aridity of the landscape meaning that people have tended to populate areas where there is water (Wiseman 1992). Over 60% of Botswana is covered by sparse savanna woodland and scrub while the northern parts have more open woodlands (Central Statistics Office 2004). There are three kinds of land tenure (Matsa & Mutekwa 2009). The first is that of state land which is owned by the government. The second is tribal land and the third is freehold land (Matsa & Mutekwa 2009). Customary law in Botswana allows for the allocation of land to citizens based on their need which is widely interpreted to mean their ability to use the land (Matsa & Mutekwa 2009). Thirty nine percent of Botswana's land area is designated as either protected land or as Wildlife Management Areas (Central Statistics Office 2005). More than half (55%) of the country's total land area is communal land while 42% is state land (Statistics Botswana 2013). Seventy nine percent of communal land is used for residential areas and pastoral and arable activities (Statistics Botswana 2013). However, from 1981 to

2007, there was a distinct drop in the amount of communal land and a relative increase in the amount of state land (Statistics Botswana 2013).

The Department of Forestry and Range Resources (DFRR) is the government institution responsible for forestry administration and management. This department lies within the Ministry of Environment, Wildlife and Tourism and is "charged with the conservation, protection, and management of vegetation resources in Botswana." (Forest Act 8 2005). The Forest Act 8 (Chapter 38:03) was implemented in 1968 and revised in 1980 and 2005 and provides the legal framework for the management of forest resources. Part IV section 11(2) of the Act states that "no person shall fell, cut, take, work, burn, injure or remove any protected tree unless he is the holder of a license to do so…" Prohibited activities in the Forest Reserves, according to Part V section 12, include removing forest produce; residing or building any kind of infrastructure in the reserve; setting fire to anything; grazing livestock or cultivating land or being in the possession of any kind of harvesting tools. Prohibited activities on State land (Part V section 13) include felling, injuring or removing any tree within 10m of a riverbank; removing any forest produce other than that used for domestic purposes in a private household or by communities entirely dependent on forest produce for their living. These prohibited activities may only be carried out if a person has the necessary license to do so. In this case the DFRR "issues permits and licenses to individuals and groups who are interested in harvesting or dealing in veld products and their derivatives as a regulatory measure" (Forest Act 8 2005). The kinds of permits that may be issued are the Harvesting of Veld Products Permit, the Veld Products Dealers Permit and the Veld Products Export Permit.

The 1968 Act was implemented mainly to control and protect Botswana's Forest Reserves but the land area of these reserves is only 0.8% of the country's total land area and therefore the sphere of influence of the Act has been relatively small (Alba 2004). This has also meant that there were few administration systems put in place to deal with the management of other indigenous forest or woodland resources, especially those on tribal or communal land which cover 50% of total land area and function under an open access regime (Alba 2004). Because of this, and a breakdown in customary rules, local communities had little management over tribal or communal land meaning that in many cases overexploitation, localised environmental degradation and deforestation occurred (Alba 2004). Due to this, forestry institutions have tried to implement various tree planting programmes and to link sustainable forest management to the tourism industry (Alba 2004). However, major factors have led to ineffective implementation of forestry development objectives including the prevalent land tenure system, limited investments in the forestry sector, the narrow scope of the current policies and legal frameworks and the low profile of the forestry administration (Alba 2004).

The current aims of the Forest Act (as of 2005) are "to reinforce the role of forestry in poverty reduction; increase the contribution of trees, forests and woodland to local, regional and national economies; promote awareness of the role of forests in enhancing environmental sustainability; to promote participatory approaches to conservation, management and sustainable utilisation of forest resources

and to create an enabling legal and institutional environment for effective policy implementation" (Forest Act 8 2005). The Act encourages the decentralisation of forest governance with an important focus on local community involvement in resource management (Alba 2004). Despite this, there has been very little forest resource research done and in many cases objectives have not been fully implemented. There are few other forest governance institutions apart from the DFRR and a limited number of non-government organisations. The disadvantages of decentralisation include an inability to provide services and the undermining of local initiatives by land tenure systems, institutional structures, markets and wider national development strategies (Tacoli 2003). Therefore serious efforts need to be made to ensure that local institutions have the capacity and legitimacy to carry out their management objectives (Tacoli 2003).

Research has shown that natural resources are being affected by human activities such as changes in land use and agriculture as well as adverse climate conditions, increases in animal numbers, both wild and domestic, and wild fires (Central Statistics Office 2004). As well as declining natural resources, another problem facing communities in these areas is that of wild animals. The competition for resources between animals and humans poses a problem to the sustainable use of resources (Central Statistics Office 2005). Affairs related to wildlife are run by the Botswana Department of Wildlife and National Parks and the government tries to ensure that adequate compensation is given to people who have been affected by the behaviour of a wild animal (Central Statistics Office 2005). Up until 2013, the hunting or capturing of wildlife was controlled by the government through an annual number of hunting quotas (Central Statistics Office 2005). But in 2013, hunting of any kind was banned in Botswana. Nonetheless, the wildlife sector makes an important contribution to Botswana's economy through its attraction of tourists (Central Statistics Office 2005). The northern parts of Botswana are high-quality tourist areas that generate important economic returns for the country (Barnes 2001). Tourism is the second largest GDP contributor but the tourism industry has been largely capitalised by foreign investors as they are able to bid for safari enterprises and pay a license fee to the Village Development Committee (Blaikie 2006). Little effort, however, is made to employ local people or to develop local skills (Blaikie 2006). The power of the village *kgotlas* (tribunals) to make any decisions regarding the management of land has been largely undermined by the formation of government Land Boards (Blaikie 2006). Community involvement in tourism and its benefits has largely been restricted to wildlife which is now dominated by foreigners and the Community Trusts which have been set up through the CBNRM initiatives (Blaikie 2006). The Community Trusts have mainly been taken over by wealthy districts and so the benefits of these programmes do not reach the local populations for which they were intended (Blaikie 2006). Crafts for the tourism industry have also not led to local skills development or to a substantial income for the local communities (Blaikie 2006).

Another issue that challenges livelihoods in Botswana is that of climate change. Botswana lies in a highly variable climate zone where droughts occur every 3 to 5 years with highly variable rainfall

patterns in-between (Dube 2003). Due to climate change, average minimum temperatures are expected to rise along with aridity and evaporation rates all of which will place stress on water availability and river systems (Dube 2003). This change in climate, and subsequent pressures on water supply, is likely to have serious implications for crop production and fishing practices for people who live along river courses (Dube 2003). The potential loss of biodiversity will also impact on the supply of savanna products and habitats for wildlife in the area (Dube 2003). Vulnerability to climate change can partly be reduced by improving households' resilience through improved education, employment opportunities, and access to credit and markets (Dube 2003).

In many households in Botswana, sources of income include crop production, animal husbandry (especially cattle), wage employment, social grants, remittances and self-employing businesses such as beer brewing (Wikan 2004). The productive capacity of a household depends on its land, labour and capital opportunities but land available for crop production in Botswana is often communal and in this case is not considered a household asset (Wikan 2004). The majority of households use fuelwood for their energy needs but an increasing loss of savannas means that this resource is becoming increasingly scarce (Watson & Dlamini 2003). Other savanna products that are harvested in Botswana include grass, reeds, mokola palms for basket weaving, mopane worms, edible fruits and berries and medicinal plants (Watson & Dlamini 2003). Research has shown that the main tree species that are harvested for fuelwood and building materials are *Acacia mellifera*, *Terminalia sericea*, *Colophospermum mopane* and *Acacia galpinii* (Central Statistics Office 2004). The main tree species that are harvested for food or fruits are *Grewia flava*, *Hyphaene petersiana*, *Boscia albitrunca* and *Berchemia discolor* (Central Statistics Office 2004). The grapple plant (*Harpagophytum spp*.), or devil's claw, is a medicinal plant that is the most commercially harvested plant in Botswana and is now a threatened species (Central Statistics Office 2004). Other threatened species include the mokola palm (*Hyphaene petersiana*), used for basket weaving, and the *Hoodia* plant (Central Statistics Office 2004).

Various studies conducted in the Okavango Delta, in northern Botswana, show that the use of NTFPs is often an important livelihood strategy (Mmopelwa & Ngwenya 2008). The harvesting of veld products was largely done by middle-aged women who collect river reeds, thatching grass, water lilies, mokola palms and papyrus while the fishing was mostly done by men (Mmopelwa & Ngwenya 2008). The sale of NTFPs is an important safety net during times of drought when crop production is hampered (Mmopelwa & Ngwenya 2008). The majority of households that make use of these alternative livelihood strategies have a monthly income of less than P 250 (US$ 30) (Mmopelwa & Ngwenya 2008).

Therefore, there is evidence of the use of NTFPs as well as rapid urbanisation in Botswana. For this reason, the change in NTFP use in rural and urban areas needs to be explored. These investigations are important for future livelihood and environmental sustainability.

# 3. Methods

## 3.1 *Research approach*

This study employed a mixed methods approach using both qualitative and quantitative data collection and analysis. Case study research was conducted in the three settlements of Kasane, Kazungula and Lesoma. Case studies are employed when there is a need for the research to be holistic, contextualised and understandable (Ritchie & Lewis 2003). A case study approach was thus considered relevant as the study aimed to provide an holistic understanding of the use of and access to NTFPs and the concurrent effects of urbanisation in a contextualised setting. One of the criticisms of a case study approach is that it is not generalisable (Flyvbjerg 2006). While not necessarily representative and generalisable, this research does provide some insight into the use of and access to NTFPs in the context of the study area (Corbetta 2003).

Multiple methods of data collection were employed including household interviews, key informant interviews, focus groups and market surveys. DFFR permit data was also reviewed. Using multiple research methods around the same topic helped to add breadth and depth to the research study and to validate and triangulate the research evidence (Ritchie & Lewis 2003).

The research for this project was done in collaboration with the Centre for African Resources: Animals, Communities and Land use (CARACAL) which is a local non-government organisation, based in Kasane, which focuses on conservation and community livelihoods. This collaboration was possible as I had worked and volunteered for CARACAL in the past. A Memorandum of Understanding was signed between myself, UCT and CARACAL before the commencement of this research. Research permits from the Botswana Department of Wildlife and National Parks, ethical clearance from the

University of Cape Town's Faculty of Science Research Ethics Committee (approval code: FSREC 01–2014) and permission from the *Kgosi* (Chief) of each area (Kasane, Kazungula and Lesoma) were obtained before the commencement of data collection.

## 3.2 *Study site*

The research for this project was conducted in Kasane, Kazungula and Lesoma in northern Botswana. The town of Kasane is bordered by the Chobe National Park to the west and the smaller town of Kazungula, which lies 9km downriver and east of Kasane. Further south from this is the smaller village of Lesoma which lies about 40km from Kasane and Kazungula and is located inland from the Chobe River. Kasane is the administrative centre for the Chobe District but these three settlements are 500km from the nearest major population centre of Francistown. These settlements are connected by good-conditioned paved roads to urban centres in the rest of Botswana, Zambia and Zimbabwe. The paved road through these areas is a central transportation route from South Africa into Zambia and then the

rest of Africa. Figure 1 provides an image of Botswana and its districts, neighbouring countries (Namibia, Zimbabwe and Zambia) as well as the study site shown in the red box. Figure 2 shows the locations of the three settlements relative to one another.


Figure 1: Google Earth image of Botswana and the study site (red box).


Figure 2: Google Earth image of the settlements.

The Chobe District, in which these settlements are located, has a population of about 23 500 people (www.geohive.com). Kasane has a population of around 9 008 people (Central Statistics Office 2009) while the populations of Kazungula and Lesoma are 4 133 and 613 people respectively (Central Statistics Office 2009). Kazungula saw rapid expansion, as well as crop cultivation, with the establishment of a school and a clinic in the 1940s (Lepetu *et al*. 2009). Lesoma had its first recorded settlement in 1860 and the growth of the village occurred following the influx of people who were fleeing the liberation war in Zimbabwe during the 1970s (Lepetu *et al*. 2009). Most of the village is surrounded by protected areas (Lepetu *et al*. 2009). Kasane on the other hand was not a traditional village but was rather established, in the 1950s, around Government Offices and for this reason the town has varied ethnic and social groups (Lepetu *et al*. 2009). Despite Kasane having improved infrastructure and housing, there is a land shortage due to the fact that the town is bordered by a national park, a river and a forest reserve (Lepetu *et al*. 2009).

Kasane and Kazungula are considered urbanising areas while Lesoma is a rural village. The lack of a standardised definition of what constitutes an urban area, usually based on population size, density or other indicators (Brenner & Schmid 2013) means that the classification of Kasane and Kazungula as urban is loosely based on the larger population sizes of these settlements and the availability of improved amenities and services. Figures 3, 4 and 5 provide a graphical indication of the relative levels of urbanisation in each settlement.


Figure 3: Google Earth image of Kasane.


Figure 4: Google Earth Image of Kazungula.


Figure 5: Google Earth Image of Lesoma.

Surrounding all three of these settlements are state-owned Forest Reserves where harvesting of forest resources is limited through a government permit system. Botswana's six Forest Reserves were mostly founded on tribal land and now make up about 0.8% of the country's total land area of 4 373 km$^2$ (Central Statistics Office 2004). The Kasane Forest Reserve was established in 1968 and is roughly 132 km2 (Central Statistics Office 2004). The other five Forest Reserves were established in 1981 and these

are the Kasane Extension Forest Reserve (475 km2), the Chobe Forest Reserve, the Kazuma Forest Reserve, the Maikaelelo Forest Reserve and the Sibuyu Forest Reserve (Central Statistics Office 2004). Outside of the Forest Reserves and other state land there are communal lands where resources may be freely accessed and harvested for trade and use (Central Statistics Office 2004). The Forest Reserves relevant to this study are the Kasane and Kasane Extension Forest Reserves. These Reserves were first established in order to protect valuable wood resources which cannot be accessed without permission from the Department of Forestry and Range Resources (DFRR) (Central Statistics Office 2004). The Kasane Forest Reserve is in very close proximity to Kasane, Kazungula and Lesoma and already has a well-developed road network (Lepetu et al. 2009). This means that there are large human pressures on this area such as tourism, settlement expansion, government infrastructures (Lepetu et al. 2009). Already, large parts of the Forest Reserve have been demarcated for residential areas (Lepetu et al. 2009). There are also biological pressures such as wild fires and large elephant populations (Lepetu et al. 2009). Figure 6 provides a map of the current land uses in the Chobe District.

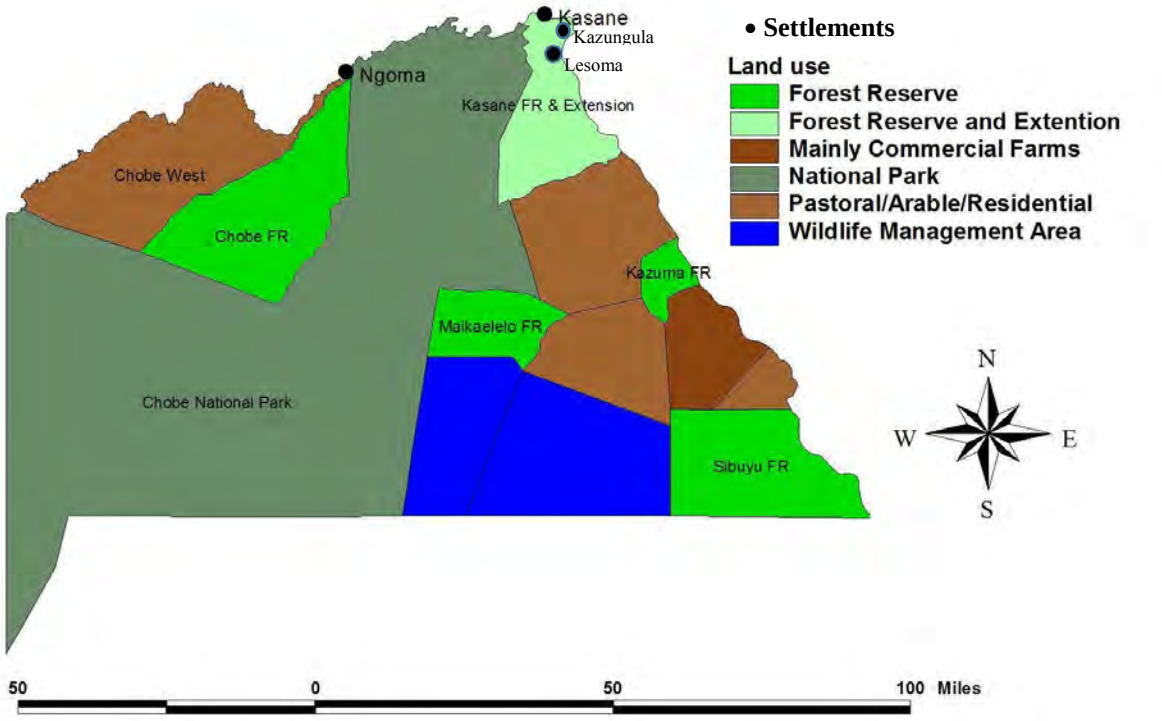



Figure 6: Map of the study settlements (Kasane, Kazungula and Lesoma) and the present land use in the Chobe District.

### 3.3 *Household interviews*

Semi-structured household interviews were conducted in each of the settlements in order to gain a better understanding of the NTFPs that are used and the opportunities and barriers communities face in accessing and utilising them. Table 1 shows the sample size of each area and its relative representation. Although the sample sizes are not in direct proportion to the relative sizes of the settlement, this study

intended to get a better understanding of the NTFP use and access in these areas, through in-depth interviews, rather than providing generalisable information.

Table 1: The total number of households, the sample size and its percentage of the total number of households in each settlement.

| | Total number of households | Sample size | % of total number of households |
|---|---|---|---|
| Kasane | 2 094 | 30 | 1.4 |
| Kazungula | 961 | 30 | 3.1 |
| Lesoma | 143 | 25 | 17.2 |

The household interviews were carried out during February and March 2014. Households were chosen by interviewing a household on the right side of the road and then next interviewing the household that was two houses down on the left side of the road. When there was no one at home, the household to the right was then interviewed and so on. At the end of each road, either the left or the right turn was chosen alternately. This systematic sampling method was chosen as it made it easier to interview households where there were household members available at that time. The respondent was chosen based on who was willing to participate in the study. Only one person was interviewed but provided information as it related to the whole household.

The interview was carried out based on a questionnaire (Appendix 1). This questionnaire was developed after piloting two earlier versions on a few households in Kasane. The interviews were carried out in English, Setswana or the local dialect based on the preference of the respondent and so a translator was present for each interview. Before the interview began, the respondent had the purpose of the study explained to them as well as the confidential and anonymous nature of the information. If the respondent agreed to participate, they signed an informed consent form. Each interview took an average of 45 minutes to complete. The information gained from the household interviews is presented in this thesis as both quantitative and qualitative data.

### 3.4 *Key informant interviews*

Semi-structured interviews were conducted with four key informants and the discussion was recorded if permissible by the interviewee. In this case the interviews were conducted in English. Each interview was conducted as a discussion based on a few guiding questions.

Key informants included the Senior Forestry Officer for the Kasane office of the Department of Forest and Range Resources (DFRR) who was interviewed regarding the current use of NTFPs and the opportunities and barriers that communities might face in the utilisation of resources (Appendix 2). A similar interview was also conducted with the court president and chief of Kasane. In addition to the afore mentioned topics, he was asked about the role of the tribal authorities and the *kgotla* (tribunals) with regards to natural resource use and whether or not this role had changed over the years (Appendix 3). Other key informants were the tourism development manager at the Botswana Tourism Organisation

and the trust manager of the Chobe Enclave Conservation Trust (CECT). The tourism development manager was asked about the role that tourism plays in offering people opportunities for using, accessing and benefiting from NTFPs (Appendix 4). He was also asked about some of the negative impacts that tourism might be having in the area. The trust manager of CECT, which is one of the community-based natural resources management (CBNRM) organisations in the Chobe region, was asked about the history and functions of CBNRM projects in Chobe and whether any of these initiatives dealt with NTFPs and their use (Appendix 5).

### 3.5 *Focus groups*

Focus groups can help to explore how people talk about and relate to a topic through a conversation with others (Ritchie & Lewis 2003). They were employed for this study so that another perspective could be gleaned. Two focus groups were conducted during March 2014 at the Lesoma and the Kazungula kgotlas. Table 2 provides a summary of the gender and age of the respondents in each group. These focus groups aimed to get a better understanding of the younger generation's perspectives around NTFP use, with respondents ranging from ages 18 to 30. The focus groups were carried out in English, Setswana and local dialects with the aid of a translator and each session took about 1 hour to complete. The focus groups were run as an informal discussion around what NTFPs are used, whether or not it is easy to access resources, if traditional knowledge surrounding resources is being passed down from generation to generation, and what aspirations the youth have in terms of lifestyle, tradition and culture as it relates to NTFP use in the future. The presentation of the information obtained during these focus groups was in the form of qualitative data discussed within the context of the material gained from other sources of data collection.

Table 2: Summary of the number and age range of the focus group participants in Kazungula and Lesoma.

| | Male participants | Female participants | Age range of participants (years) |
|---|---|---|---|
| Kazungula | 4 | 10 | 18 – 25 |
| Lesoma | 4 | 5 | 21 - 26 |

### 3.6 *Market survey and DFRR permit data*

A market survey of Kasane was carried out in February 2014. Lodge curio shops, informal curio stalls and informal market stalls along the main road in Kasane were surveyed to try and get an idea of the market opportunities available for the commercialisation of NTFPs in the area. Only the main road through Kasane was included in this survey as it was the only road where market stalls were positioned. In each shop or stall a very basic estimate, gathered as a percentage, of the items made from NTFPs relative to the other items being sold was recorded as well as the origin of these items. These items would consist of curios such as wood carvings, palm-leaf woven baskets, grass-woven place mats, reed mats, wild spinach, edible insects etc. With regards to the market survey, nine lodge curio shops and

curio markets were surveyed including five lodge curio shops, three informal curio stalls and the Kasane informal market stalls.

Permit data from the DFRR Kasane office were collected in order to see what permits had been obtained for the harvesting of natural resources in the last four years. This information was collected from the DFRR and recorded in Microsoft Excel. The data collected was from 2010 to 2013 and contained information such as issue dates, the product being harvested, the amount of product being harvested, the area of harvesting and the type of permit issued. Both the market survey and the permit data are presented as additional quantitative data in this report.

### *3.7 Limitations*

a) There is always the possibility of response bias occurring during personal interviews. The information in this study may only represent the responses respondents gave to questions rather than their actual opinions. As the interviews were conducted as semi-structured interviews with open-ended questions and no time limit, respondents were given the chance to answer the questions in as much detail as they wanted. This goes some way to reducing the response bias but it may not have removed it completely.
b) These interviews were conducted during summer and so the responses around the types of NTFPs being used could change seasonally. The interviews were also mainly conducted during the week when employed household members, particularly men, were often not available. This could mean that only poorer households with female respondents were interviewed. This limitation is mitigated somewhat by the fact that respondent's answers provided information for the entire household rather than the individual.
c) This study employed a sample size that makes it difficult to make statistically valid inferences about what households in general do based on the findings from the sample. Despite this, the research gives insight into the opinions of those respondents interviewed and provides a deeper understanding of the relevant issues even if these findings are not generalisable.
d) The household interviews were only conducted in certain areas of Kasane which might have created some bias in the results. Other areas were excluded as here households were more affluent and so the comparison between these households and those in Kazungula and Lesoma (where the households are less affluent) would not have been relative.

# 4. Results

## 4.1 *Demographics*

In total, 85 households were surveyed: 30 in Kasane, 30 in Kazungula and 25 in Lesoma. Demographic results of the interviews are summarised in Table 3. Forty percent of respondents in Kasane and 53% of respondents in Kazungula were between the ages of 25 and 35 years old while in Lesoma most respondents (44%) were between 36 and 60 years old (Table 3). The majority of respondents in all three settlements were female. In both Kasane and Kazungula, 60% of respondents were born in Botswana but from areas outside of the study area, possibly pointing to some migration having occurred to these urbanising areas. Ten percent of respondents in each area were also from foreign countries. None of the respondents from Kasane or Kazungula were born in the more rural village of Lesoma. In Lesoma, 20% of respondents were born in foreign countries, most likely due to the influx of Zimbabwean people into this area during the liberation war in the 1970s.

More than half of the respondents in Kasane had reached some level of secondary school while 33% had completed secondary school. In Kazungula and Lesoma, 70% and 60% of respondents respectively had completed some secondary school, with the majority finishing Grade Ten. Over 70% of respondents in Kasane and in Kazungula were unemployed; this could be due to the sampling period where those respondents who were at home during the week were perhaps more likely to be unemployed. In Lesoma, only 40% of respondents were unemployed, with 28% self-employed and 28% having formal jobs. This finding is perhaps unusual in light of the fact that it is a rural village. However, Lesoma did have the highest level of tertiary education (12%) across all three settlements which could account for the larger number of formally employed respondents. In all three areas the majority of households interviewed had between five and ten members. In Kasane, 50% of heads of households were single/divorced/widowed females while in Kazungula the majority of household heads (37%) were single/divorced /widowed males. In contrast, 44% of households in Lesoma had single/divorced/widowed female household heads and 36% were resident married male household heads.

For most households, the source of power was a combination of both electricity and fuelwood (Table 3) where electricity was used for lighting and fuelwood for heating water and cooking. This was the case for half of all households in both Kasane and Kazungula and 64% of households in Lesoma. The majority of respondents in Kasane owned neither a wheelbarrow nor a vehicle and had to rely on alternative methods for harvesting NTFPs such as borrowing or renting a vehicle or carrying the products themselves. The same was true for Kazungula, where 43% of respondents had neither a wheelbarrow nor a vehicle (Table 3). In contrast, 40% of respondents in Lesoma had a wheelbarrow and 32% of households had a vehicle which could be used for the harvesting of forest products. This

could perhaps be because there were a greater number of employed people in Lesoma. The village is also located further from the urban centres which could mean that a vehicle was needed to get into town.

Although the limited sample size means these findings are not conclusive, the results do suggest that Kasane and Kazungula showed similar trends in most of their demographics whereas Lesoma seemed to differ in some cases. This was seen in the older population frequencies and the higher levels of employment and tertiary level education in Lesoma.

Table 3: The demographics of households in Kasane, Kazungula and Lesoma.

| | Kasane (number of households) | Kazungula (number of households) | Lesoma (number of households) |
|---|---|---|---|
| Age | | | |
| <25 | 27% (8) | 13% (4) | 8% (2) |
| 25-35 | 40% (12) | 53% (16) | 28% (7) |
| 36-60 | 20% (6) | 27% (8) | 44% (11) |
| 61-75 | 13% (4) | 7% (2) | 16% (4) |
| >75 | 0 | 0 | 4% (1) |
| Gender of respondents | | | |
| Female | 77% (23) | 70% (21) | 68% (17) |
| Male | 23% (7) | 30% (9) | 32% (8) |
| Place of birth | | | |
| Within the study area | 30% (9) | 30% (9) | 40% (10) |
| In Botswana but outside the study area | 60% (18) | 60% (18) | 40% (10) |
| Foreign country | 10% (3) | 10% (5) | 20% (5) |
| Education | | | |
| None | 10% (3) | 10% (3) | 12% (3) |
| Some primary | 3% (1) | 0 | 8% (2) |
| Primary | 0 | 0 | 4% (1) |
| Some secondary | 53% (16) | 70% (21) | 60% (15) |
| Secondary | 33% (10) | 13% (4) | 4% (1) |
| Tertiary | 0 | 7% (2) | 12% (3) |
| Employment | | | |
| Unemployed | 70% (21) | 73% (22) | 40% (10) |
| Self-employed | 7% (2) | 3% (1) | 28% (7) |
| Formal occupation | 23% (7) | 17% (5) | 28% (7) |
| Pensioner | 0 | 7% (2) | 4% (1) |
| Household head | | | |
| Resident married male | 23% (7) | 30% (9) | 36% (9) |
| Married male working away | 0 | 3% (1) | 4% (1) |
| Single/divorced/widowed female | 50% (15) | 27% (8) | 44% (11) |
| Single/divorced/widowed male | 3% (1) | 37% (11) | 12% (3) |

| | | | |
|---|---|---|---|
| Other | 23% (7) | 3% (1) | 4% (1) |
| Household size | | | |
| <5 | 17% (5) | 33% (10) | 32% (8) |
| 5-10 | 63% (19) | 57% (17) | 56% (14) |
| >10 | 20% (6) | 10% (3) | 12% (3) |
| Source of power | | | |
| Electricity | 17% (5) | 20% (6) | 12% (3) |
| Fuelwood | 33% (10) | 27% (8) | 24% (6) |
| Electricity and fuelwood | 50% (15) | 50% (15) | 64% (16) |
| Other | 0 | 3% (1) | 0 |
| Ownership of a wheelbarrow or vehicle | | | |
| Wheelbarrow | 17% (5) | 33% (10) | 40% (10) |
| Vehicle | 17% (5) | 23% (7) | 4% (1) |
| Both | 3% (1) | 0 | 32% (8) |
| Neither | 63% (19) | 43% (13) | 24% (6) |

### 4.2 *NTFP use*

Kasane and Kazungula showed similar patterns in household use of NTFPs while Lesoma provided a different story. Households in Lesoma used more NTFPs than those in the other two settlements. Figures 7, 8, 9 and 10 illustrate these trend. Figure 7 shows the average number of NTFPs used by households in the three settlements where the average number of resources used is higher in Lesoma (11.2 resources) than both Kasane (9.4 resources) and Kazungula (9.2 resources). Figures 8, 9 and 10 show what resources are being used in each area. The difference between the settlements is likely to be due to the more rural setting of Lesoma and its proximity to areas suitable for resource harvesting. Wild fruits for eating (98% of all households), wild spinach (98%), fish (98%), fuelwood (91%), grass for hand brushes (86%) and waterlily (84%) were used by most of the households in all three areas. Reeds for mats and edible insects were also used more often than not. The main edible insects that were consumed by households were flying ants and mopane worms. Wild mushrooms were used by more than half the households in Lesoma but were used by only half the households in both Kasane and Kazungula, presumably because households in Lesoma had better access to, and availability of, this resource which was increasingly scarce. Other important resources used more in Lesoma were wood for fences/kraals and housing poles as well as grass for thatching and medicines. However, these resources were used by only a few households in Kazungula and even fewer households in Kasane. This was due to the nature of the housing in the different settlements where houses in the more rural context of Lesoma were constructed from traditional, natural materials such as wood and grass while in the urban settings of Kasane and Kazungula, settlements were built using modern materials such as bricks, cement and corrugated iron. Households in Kasane and Kazungula also had better access to modern clinics than those in Lesoma and might therefore have relied less on traditional medicines compared to households in Lesoma. As one household member stated: “now the traditional healer is actually fading

out and that is because there are so many clinics and availability of medicines and doctors." (Respondent 60, Kasane, 23 March 2014, pers. comm.). Another reason stated, for not using medicines, was that of religious beliefs as it was believed that Christianity did not allow for the use of traditional healing methods.

Despite these differences between the settlements, there were commonalities across the three settlements in the reasons that households gave for the decreased use of certain NTFPs. These resources included bushmeat, palm leaves for weaving, wild fruits for beer and wood for household utensils and carvings. Bushmeat was no longer used, by the majority of households, due to the government regulations which banned hunting and therefore prevented access to, and possession of, bushmeat. Palm leaves were not often used as households reportedly lacked the skills to weave baskets. Wild fruits for making beer were not commonly used as most respondents either did not drink alcohol or lacked the skills to make the beer. Wood for household utensils and carvings was not used by most households as the majority of households either lacked the skills, the interest or the time to make these wood products. This reported lack of skills amongst many of the respondents could have been due to a loss of the traditional knowledge around the use and processing of these particular resources.

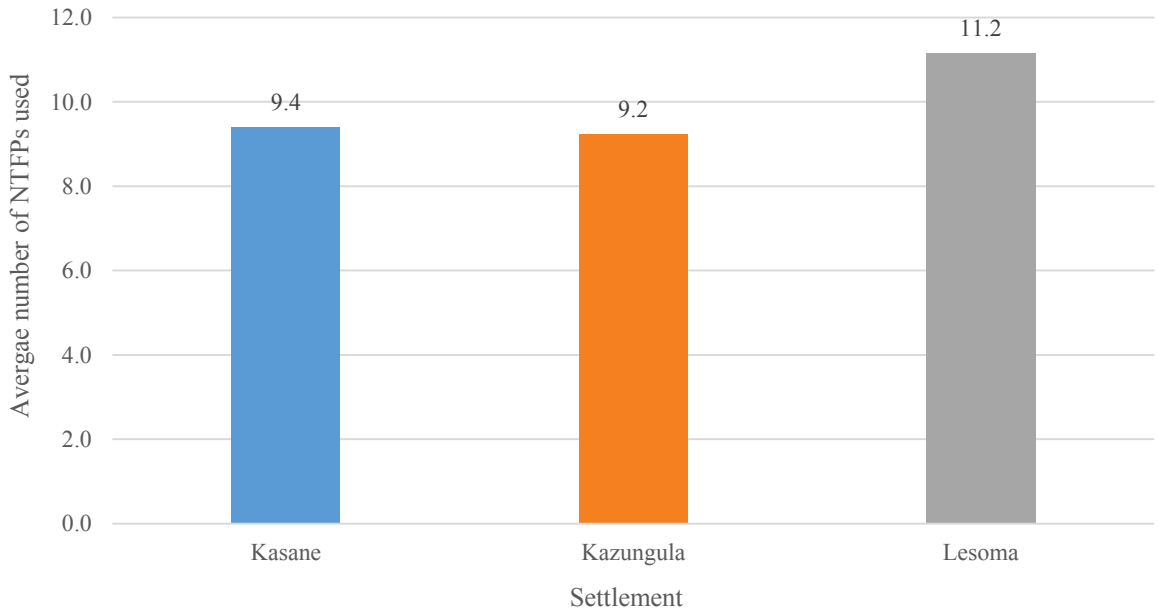



Figure 7: The average number of NTFPs used by households in each settlement.

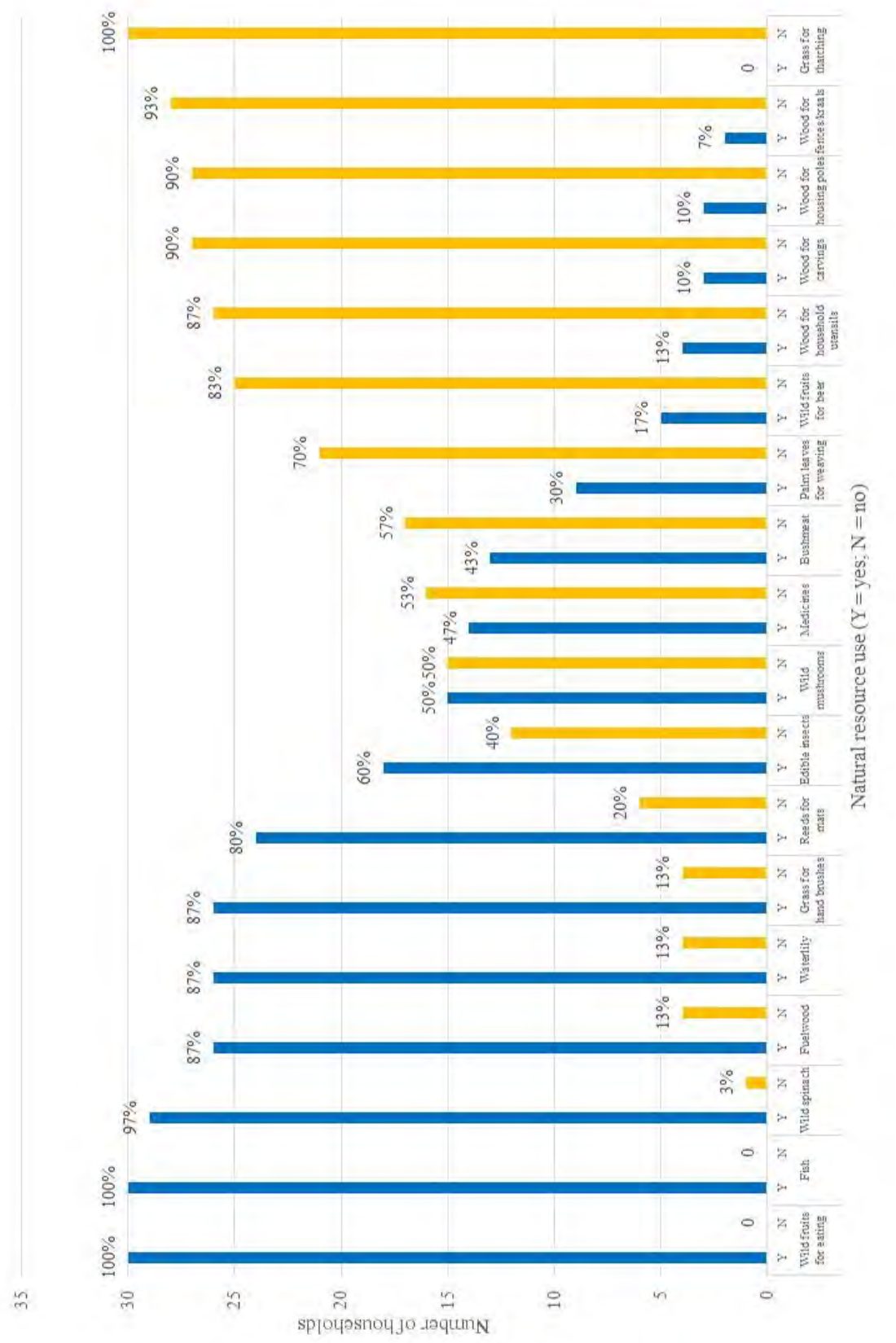



Figure 8: The use of NTFPs in Kasane

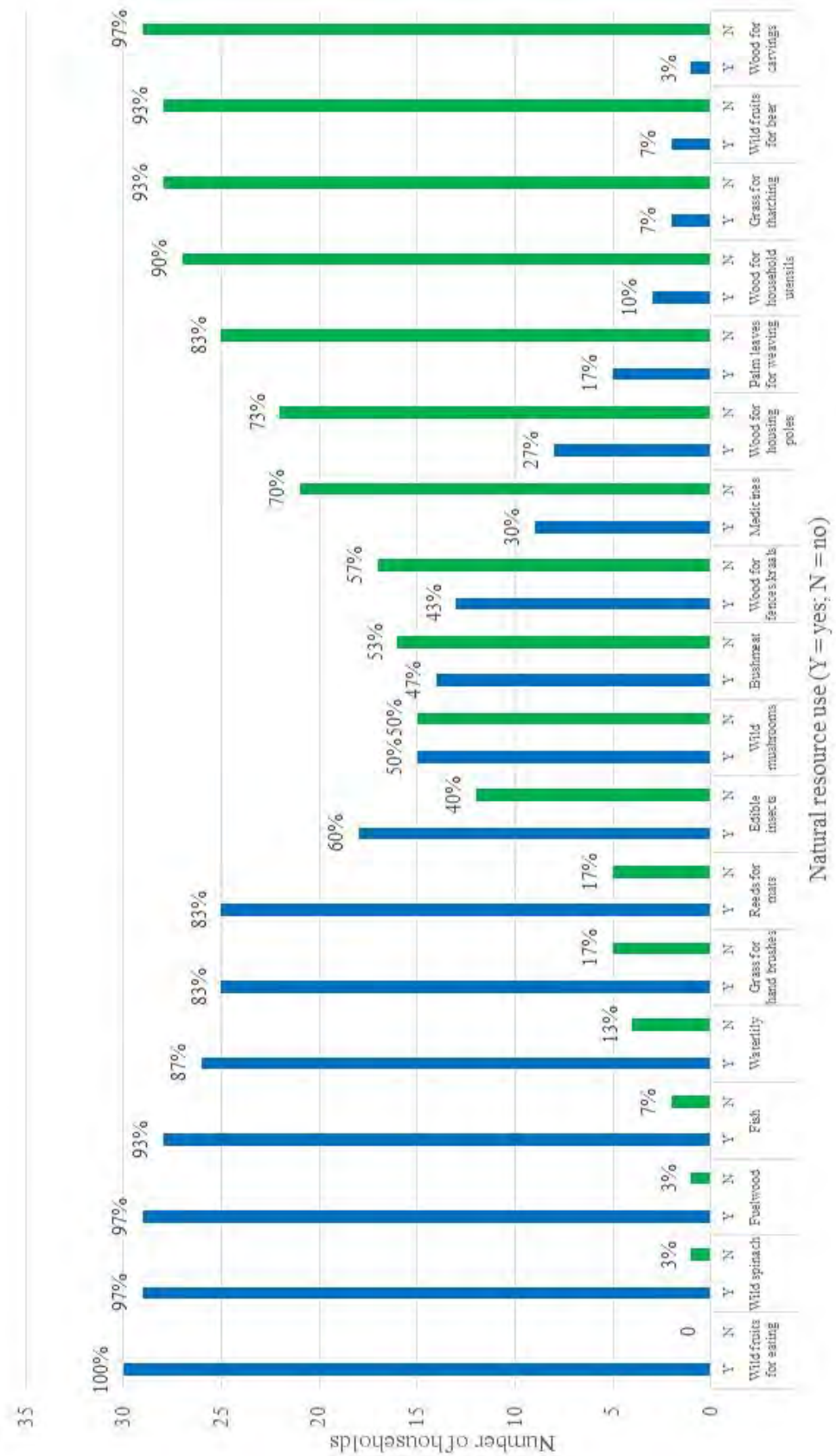



Figure 9: The use of NTFPs in Kazungula

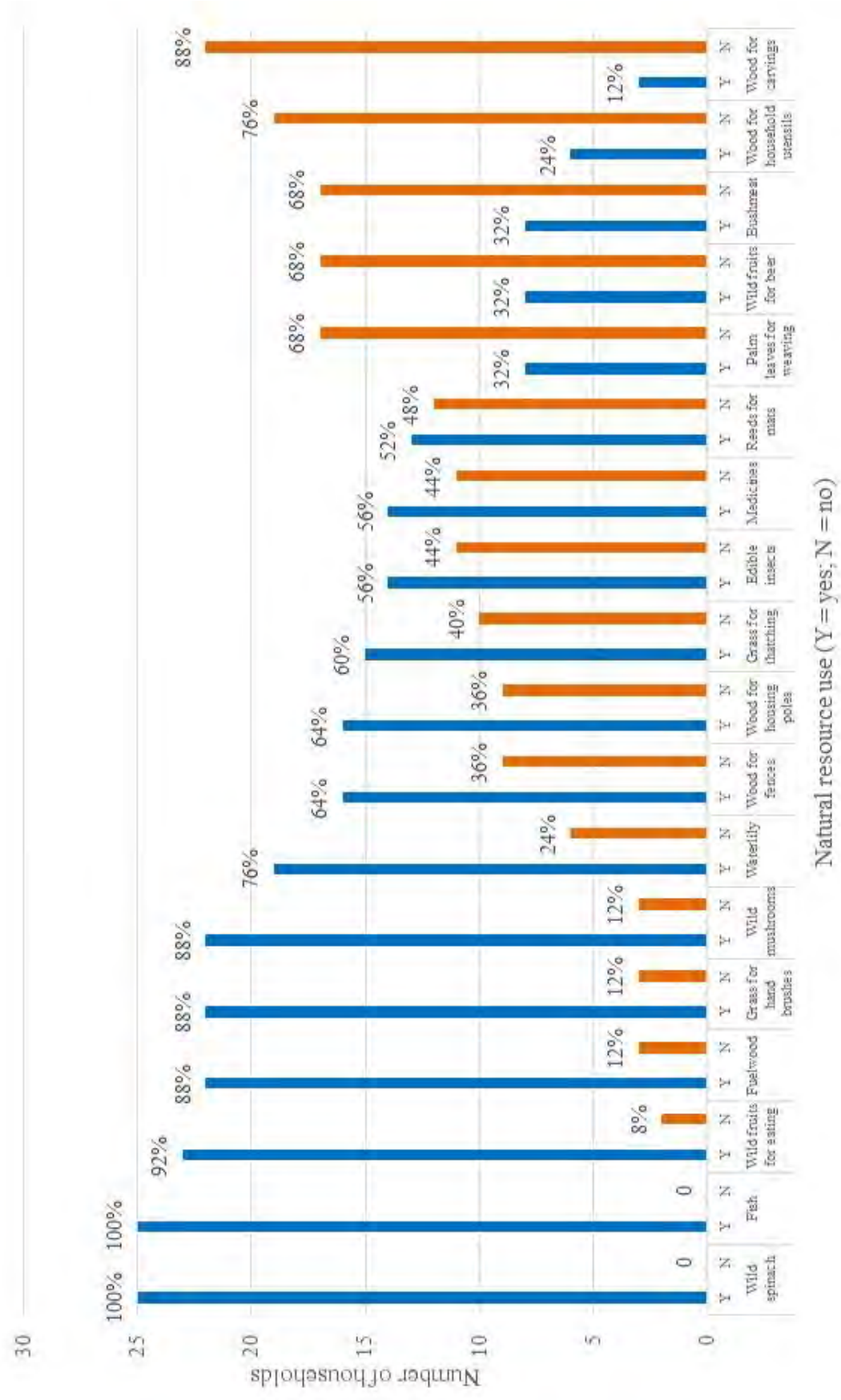



Figure 10: The use of NTFPs in Lesoma

These findings were in keeping with the information gained during the focus groups with the youth, where the main NTFPs that the respondents, in both Lesoma and Kazungula, discussed using were grass, reeds, wild animals, trees, medicinal plants, fuelwood, wood for housing poles, charcoal, waterlily, fish and sand for construction. Some of the specific uses mentioned were the plant monepenepe (*Cassia abbreviata*), which was used to cleanse the blood, and other trees which produced wild fruits such as mongongo (*Schinziophyton rautanenii*), mowana (*Adansonia digitata*) and morotologa (*Ximenia spp.*), devils claw (*Harpagophytum spp.*) which cured rashes, moselesele (*Dichrostachys cinerea*) for fuelwood, thotamadi (*Pterocarpus angolensis*) which was also used to clean the bloodstream and motswere (*Combretum imberbe*) which could be used for toothpaste and as a medicine.

According to the DFRR permit data fuelwood was the most permitted harvest product (542 permits in total) with the number of permits for other products being substantially less than this except for grass harvesting that took place in 2012 (Table 4). A total of 197 permits was also issued for bird hunting in 2012. The high numbers during this year, for grass harvesting and bird hunting, might have been due to better record keeping in 2012 due either to new reporting staff or because there was better permit enforcement for grass and bird hunting during this year. This permit data might have suggested to government bodies, such as the DFRR, that fuelwood, grass, wood for poles, trees and birds were the most commonly used natural resources. This suggestion was reiterated by the response of the Senior Forestry Officer who said that "…the major one [forest product] is fuelwood because we have evidence of that through the permits" (Senior Forestry Officer, 29 March 2014, pers. comm.) as well as grass according to the number of permits that are taken out for this resource. This is contrary however to what was found in the household interviews and through the focus groups where, with the exception of fuelwood and grass for hand brushes, these products were not the most commonly used resources. This also might be because respondents were not acquiring the necessary harvest permits. Another product that the DFRR said was commonly utilised was palm leaves for weaving baskets but only 22 out of 85 households reported using palm leaves. These findings suggest a mismatch between the knowledge of government officials and practices on the ground.

Table 4: DFRR permits issued for natural resources from 2010 to 2013

| Year | Number of permits for: | | | | | | |
|---|---|---|---|---|---|---|---|
| | Fuelwood | Grass | Trees | Wood for poles | Bush clearing | Bird hunting | Mokola palms |
| 2010 | 87 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 113 | 0 | 20 | 4 | 2 | 3 | 0 |
| 2012 | 179 | 250 | 37 | 31 | 4 | 197 | 1 |
| 2013 | 163 | 0 | 16 | 4 | 3 | 3 | 0 |

### 4.3 *Importance of NTFPs*

In order to understand the relative importance of NTFPs, households were asked to rank the five most important products they used with one being the most important product and five being the least important. A product was given a score of zero if the household did not rank the item at all as this indicated that the product was of no importance. Figure 11 illustrates the importance of NTFPs across the settlements. In all cases, fuelwood was ranked as the most important resource by the majority of households. Fish was consistently ranked across all levels of importance in both Kasane and Kazungula, suggesting that it was an important product for most households in these areas, even if it was not the most important. However, in Lesoma 32% of respondents thought that fish was not important at all. This could be due to the fact that there is no body of water near Lesoma where fishing can take place. In Kasane and Lesoma, wild spinach was ranked second in importance by the majority of households (33% and 28% respectively) while in Kazungula it was of lesser importance (10% of households). Wild fruits in all three areas were perceived to be of less importance and were ranked between third and fifth by most households interviewed. Waterlily and medicinal plants also had a low ranking. In Kasane, grass for hand brushes was of almost no importance but in Lesoma it was ranked higher in number one and two. This was also the case for thatching grass that was ranked relatively highly in Lesoma compared to the other two settlements where it was not utilised by most households. Therefore, similar findings were found across all three areas with the exception of grass which was more important to households in Lesoma. The following sections focus on the five more important NTFPs: fuelwood, fish, wild spinach, wild fruits and waterlily.

Forty seven percent of households, across all three settlements, said that NTFPs were important as they were basic necessities needed for everyday life. Another reason given for their importance was that these resources improved the livelihoods of households as they provided an improved standard of living, they were important safety nets in times of need and for some households the surplus of these harvested products could be sold. This reason was expressed by 39% of the households across the settlements. Fuelwood was perceived to be an important resource as it was a household source of energy all year round.

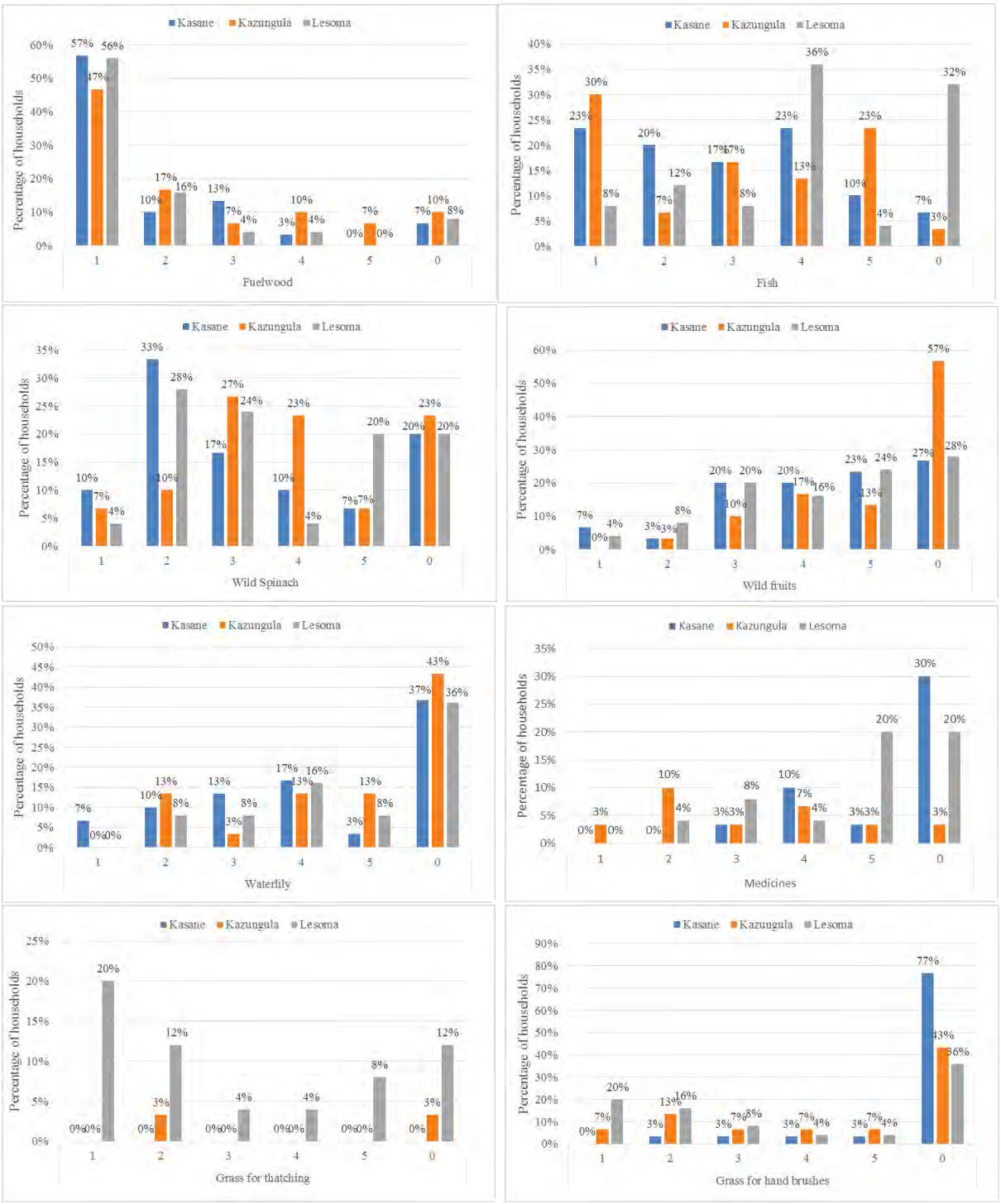



Figure 11: Rank of importance of NTFPs for households in all three settlements (1 = most important; 5 = least important; 0 = no importance)

The seasonality of use differed for each of the five most important NTFPs (Figure 12). The term 'times of need' refers to those times when the household was struggling for whatever reason and were therefore using the resource as a 'safety-net. The term 'when needed' refers to the time when a household required that resource for a specific reason. In Lesoma fuelwood, wild spinach and waterlily were used all year round by more households than in the other two areas. Wild spinach and waterlily could be used in this

way as they were dried for preservation. In Kazungula, fuelwood, wild fruits and waterlily were utilised in times of need more than in Lesoma and Kasane. Fuelwood was used all year round by the majority of households in Lesoma (88%) but only by 50% of households in Kasane and 47% of households in Kazungula. The other four resources were used seasonally, more than the other times of use, by more of the households across all three settlements.

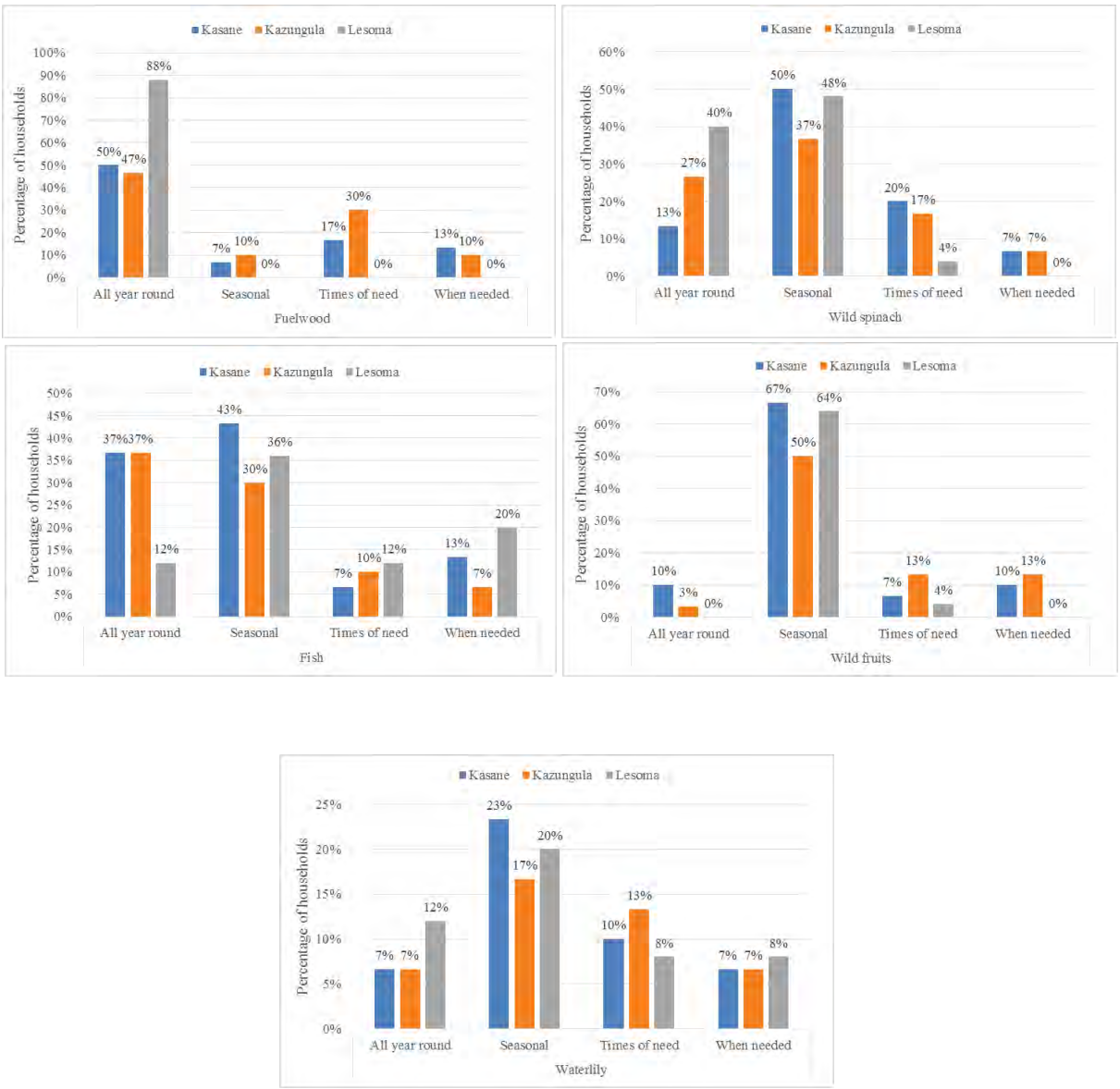



Figure 12: The seasonality of use of NTFPs between three settlements.

The majority of households harvested fuelwood and wild fruits from the bush surrounding the settlements and wild spinach from within the settlements themselves, especially within homesteads (Figure 13). Waterlily and fish were caught in the Chobe River by most households (Figure 13). Some of the other locations for harvesting lay outside the study area such as 256 km (name of an informal settlement), Nata and the Chobe Enclave but all were within the Chobe District. As can be seen in Figure 13, minimal harvesting was reported in the Forest Reserves. Figures 14, 15 and 16 show the locations of the household interviews in relation to areas of resource harvesting.

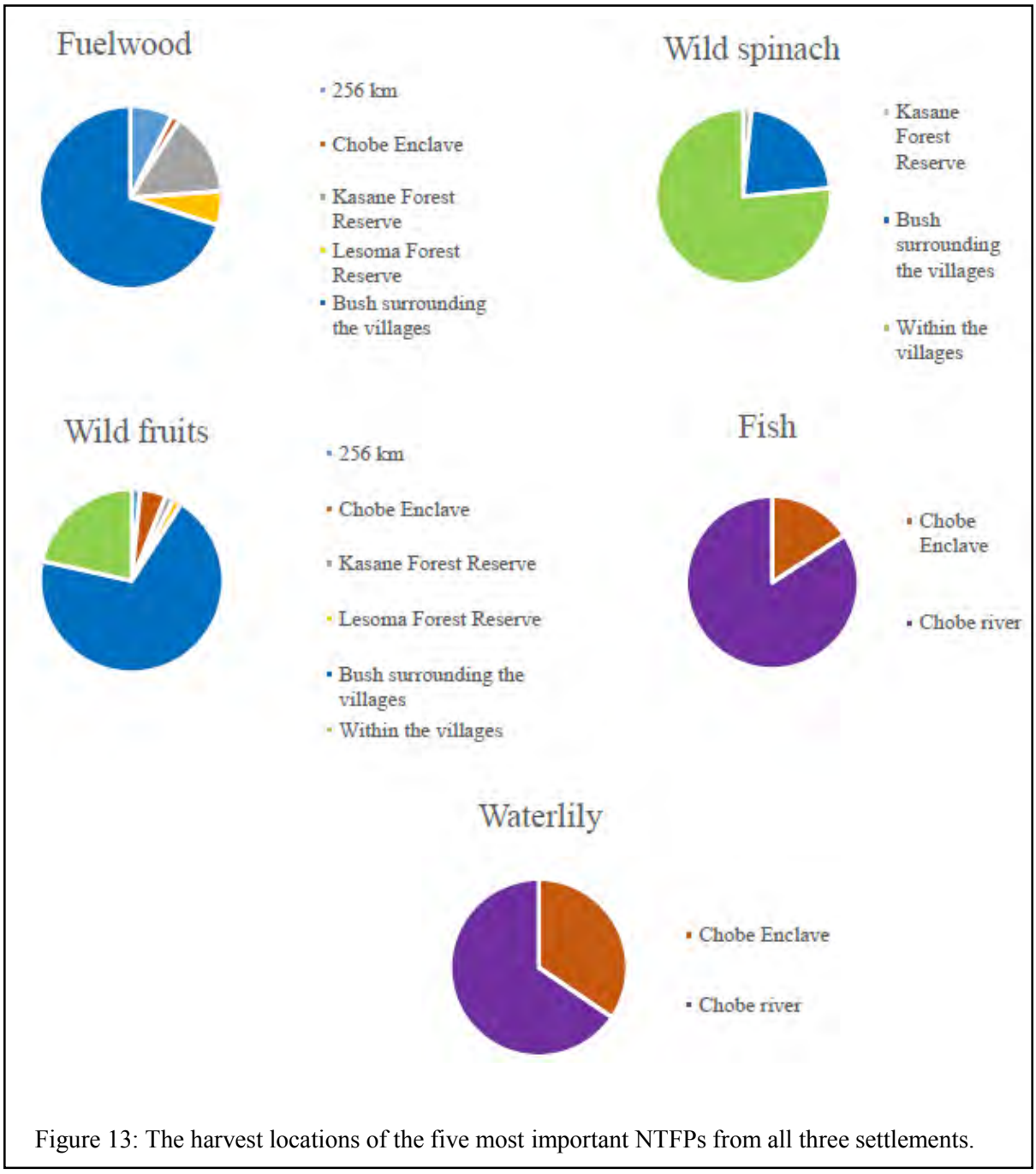



Figure 13: The harvest locations of the five most important NTFPs from all three settlements.


Figure 14: Map of Kasane showing the household interview locations and areas of NTFP harvesting (red boxes).


Figure 15: Map of Kazungula showing the household interview locations and areas of NTFP harvesting (red boxes).

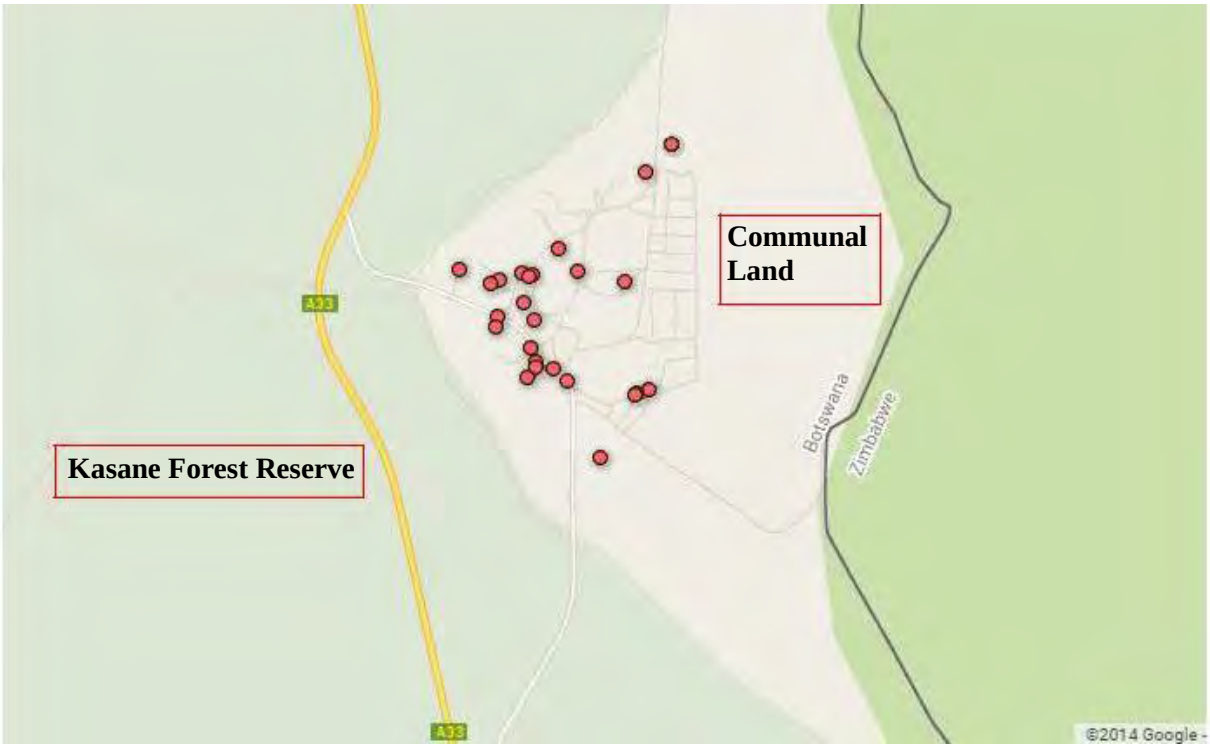



Figure 16: Map of Lesoma showing the household interview locations and areas of NTFP harvesting (red boxes).

### 4.4 *Barriers to NTFP use*

In Kasane and Kazungula, 53% and 67% of respondents respectively noted that they would like to be using fewer NTFPs (Figure 17). Forty three percent of respondents in Kasane and 37% of respondents in Kazungula said that they would rather use fewer NTFPs as they would like to conserve resources for other community members and future generations as resource availability is decreasing due to over-harvesting. Ten percent of respondents, in both Kasane and Kazungula, reported that the cost in time, energy and money to harvest resources was high and so they wish to use fewer resources. Respondents noted that they would prefer to use modern appliances and technologies such as electricity. The opposite was true in Lesoma where 76% of households interviewed would like to use more NTFPs. The barriers faced by households were restricted access to resources, decreased availability of resources and a lack of transport. The lack of transport was a barrier for some respondents as they did not have the necessary vehicle to gather large amounts of resources and in some cases, respondents did not have the transport needed to get to remote areas where certain resources were more readily available. Therefore, households in Lesoma reported contradictory findings to those in Kasane and Kazungula. This could be because people in Lesoma were more reliant on, and used more, NTFPs due to the rural context in which they lived.

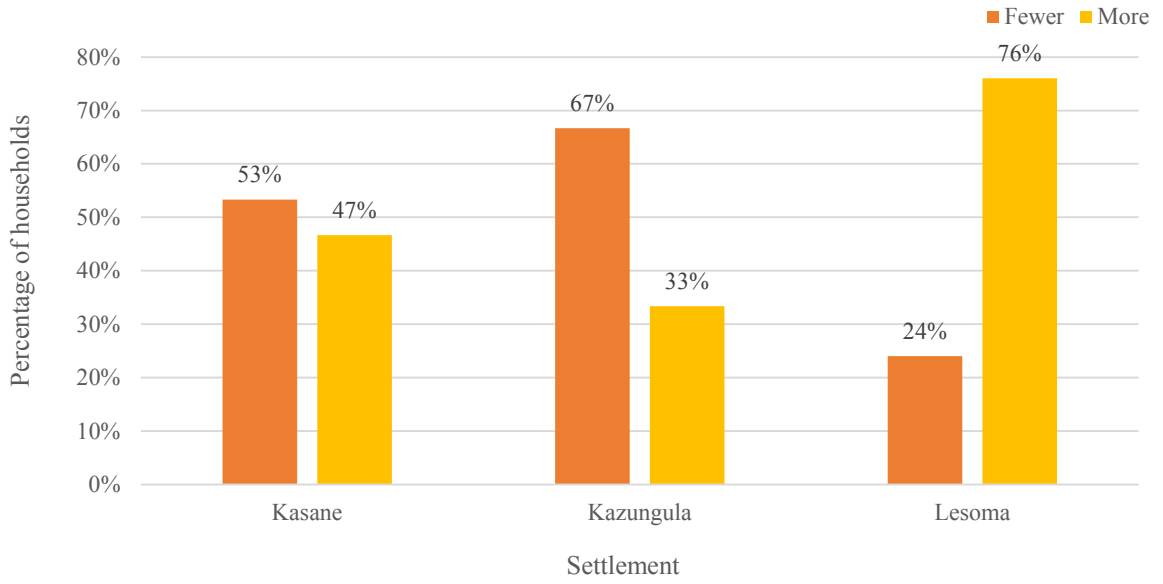



Figure 17: The percentage of households, across all three settlements, who would like to use fewer or more NTFPs.

### 4.5 *Access to NTFPs*

Thirty percent of households in Kazungula and 40% in Lesoma believed that restricted access prevented them from harvesting more NTFPs. Access was hindered by strict government controls, particularly the DFRR permit system. Access to the forest was also said to be restricted by the presence of anti-poaching soldiers and wild animals, both creating safety concerns.

The perceived ease of access to NTFPs differed among settlements (Figure 18). Limited access to resources due to the presence of wild animals was reported by most respondents in Kasane (60%). The reason for this was that the wildlife compromised their safety when harvesting, especially animals such as lions, elephants and buffalo. Animals also competed with respondents for resources, especially wild foods. The wild animals were also said to destroy crops and livestock, leading to a decrease in agriculture and creating higher household dependencies on NTFPs. The perception of limited access due to wildlife being more prominent in Kasane could be because Kasane lay on the border of the Chobe National Park, which was unfenced, and game animals could enter the surrounding harvest areas. Respondents in Lesoma also noted the presence of soldiers as a hindrance to access. The following accounts were made by some of the household members: "…this time the government is hiring many soldiers…to stay in the bush and watch those people because they come here to poach the animals." (Respondent 19, Lesoma, 12 March 2014, pers. comm.) "And the problem is the government…they don't let someone to go out and to go find the things [natural resources] themselves because of animals…he is saying we are going to poach the animals…" (Respondent 8, Lesoma, 11 March 2014, pers. comm.). The permit system was a concern to 32% of households in Lesoma. According to the permit regulations, the commercial harvesting of resources required a permit and subsistence harvesting

did not. However, this distinction between the two was often unclear. The regulations were perceived to be restrictive to resource access by respondents in Lesoma, as respondents were penalised for harvesting for supposed commercial purposes when in fact they were harvesting for subsistence reasons. Additionally, respondents wanting to harvest for commercial reasons did not have enough money to buy a permit which only reinforced their state of poverty. These laws were said to be oppressive and were not believed to have considered the diverse needs of households and reliance on NTFPs, especially by the poor. Interestingly, the permit system was not a concern for households in Kasane who were perhaps less reliant on the harvesting of NTFPs. In Kazungula, 47% of households believed that they did have easy access to resources.

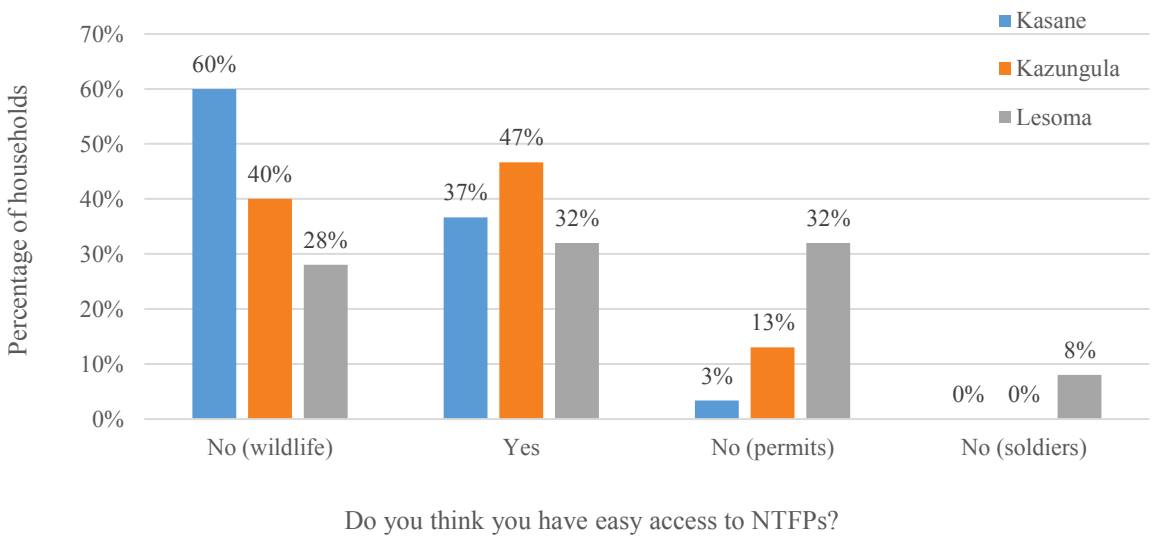



Figure 18: The perceived ease of access to NTFPs by households in all three settlements.

Focus groups with youth gave similar responses to those of the household interviews. Youth noted that access was not easy due to wild animals but that some products, such as wild spinach, could be harvested around homesteads. Other products, such as medicinal plants, might only have been available in distant places or no access areas. The focus group respondents expressed concern about the hunting ban which they believed had caused an increase in the number of wild animals present in the surrounding bush where the harvesting of forest products takes place. Respondents were concerned that as the number of wild animals increased, especially elephants, there would be competition for resources between humans and wildlife. This, it was believed, would eventually lead to environmental degradation making NTFPs less available. Respondents in both the household interviews and the focus groups noted that they were scared to go into the bush as they might be confused for poachers by soldiers. Government ownership of the Forest Reserves made it difficult for respondents to harvest what they needed from these areas, especially sand for the construction of houses. Permits requested by the DFRR inhibited free use of the forests as military officers would ask to see permits when harvesting was only for subsistence purposes.

Seventy five percent of respondents believed that tourism affected their use of NTFPs. The main reason (59%) given for this was that although tourism was seen as a good thing, its ideals conflicted with community needs. There was increased game encroachment into settlements as animals were protected for tourism interests. The need for anti-poaching units and soldiers in the Forest Reserves meant that respondents were reluctant to enter these areas to harvest resources. In this way conservation, for tourism purposes and gains, hindered community access and use of NTFPs. The restrictive nature of government regulations, implemented to conserve resources, was also believed to affect access, in particular the permit system. Tourism interests also meant that certain areas were declared no access zones, such as the Chobe National Park, thereby preventing access to resources. As one household member stated, "… [the government] chases our fathers at the Serondela side [within the Chobe National Park] back to the Lesoma side and some to the Kachikau [Chobe Enclave] side of the park… [H]e [the government] say 'no, animals you people can't kill because we want to save this animal now and make money with it and make something to show our children'…" (Respondent 14, Lesoma, March 2014, pers. comm.).

### 4.6 *NTFP availability*

Decreasing availability of all resources was raised as a direct barrier to harvesting. Thirteen percent of households in Kasane, 10% of households in Kazungula and 16% of households in Lesoma believed that NTFPs were no longer available for respondents to harvest due to commercial harvesting and the increased demand for these products.

Forty six percent of those 76 households that used fuelwood, across all three settlements, thought that fuelwood availability was decreasing. Thirty six percent of these households, across the settlements, believed that fuelwood availability was increasing due to increased destruction by elephants which created more dead wood for harvesting (Figure 19). The majority of respondents (41%), of the 68 households that used wild spinach perceived the availability to be mostly the same while an equal number of respondents (40%) believed that wild fruits were both increasing and decreasing in availability. Of the 62 households that use fish, 40% perceived the availability of fish to be increasing mostly due to the new fishing regulations that implemented a closed fishing season. This variability in responses provides an unclear picture of the availability of resources but does provide some insight into the perceptions of this availability by the resource users themselves.

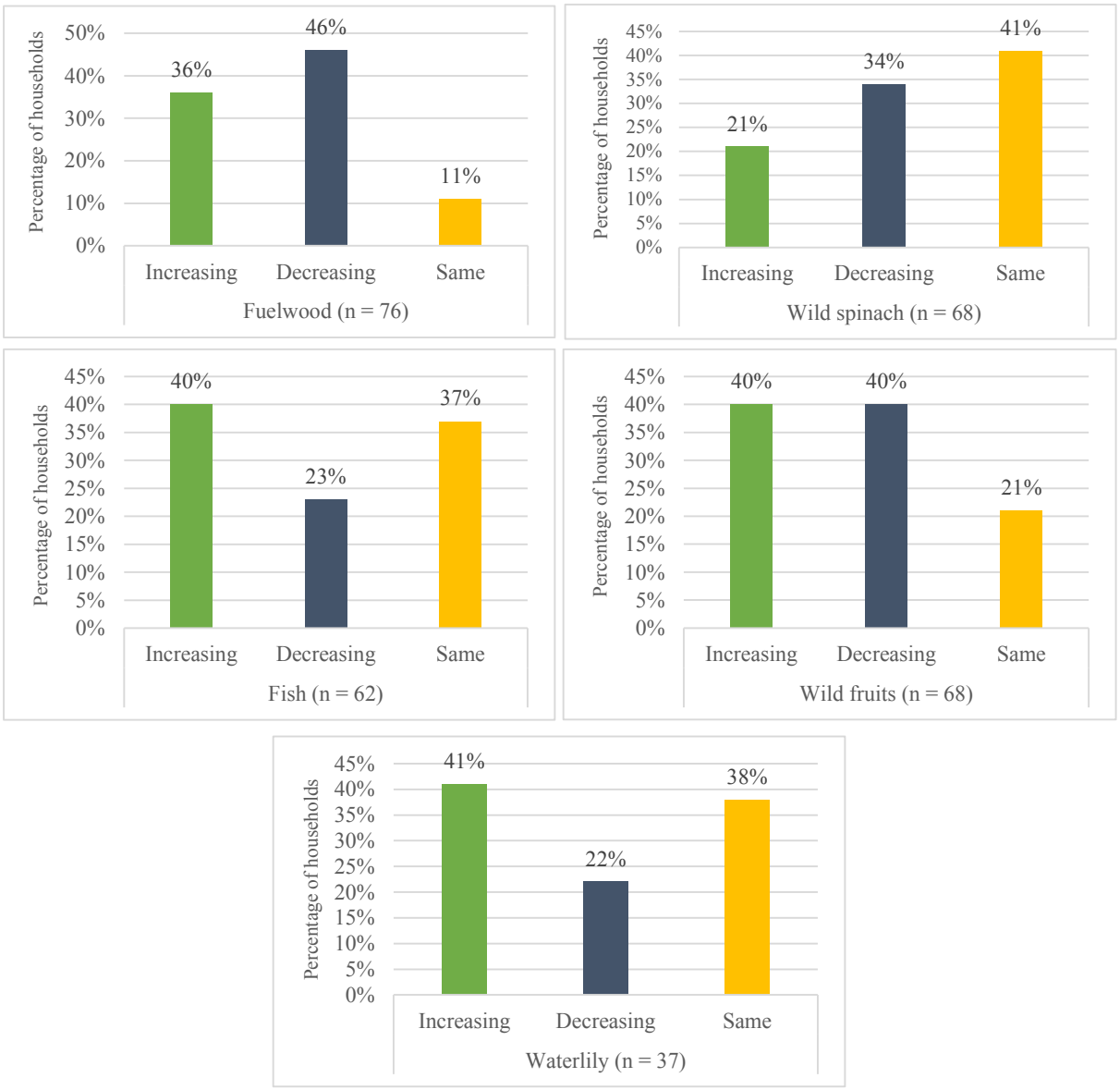



Figure 19: The perceived availability of NTFPs across all three settlements.

When asked what the major threats were to natural resources, participants gave a range of different responses (Figure 20). The majority of households believed that the most serious threats were over-harvesting (40% of households) and the destruction of natural resources by wild animals (39% of households). “The roots and fruits these days there is nothing because the elephants drop these things and finish the trees for the fruits now there is no bush food” (Respondent 42, Kazungula, 18 March 2014, pers. comm.).

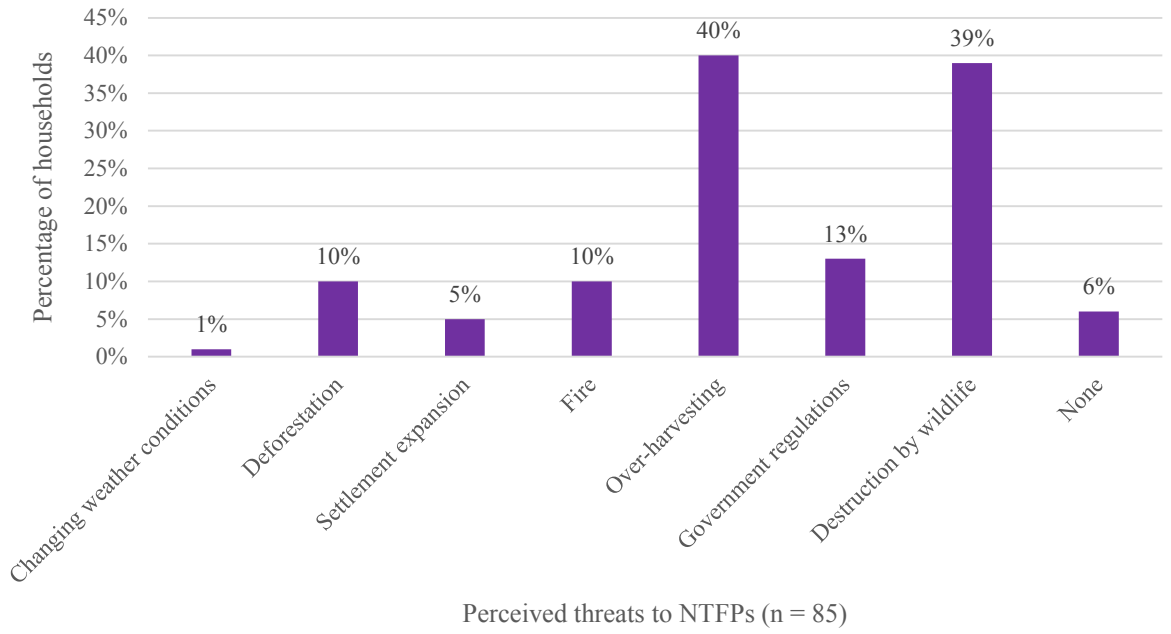



Figure 20: Household perceptions about the threats to natural resources across all three settlements.

### *4.7 Rules and regulations*

Forty percent of respondents in Kasane, 50% in Kazungula and 68% in Lesoma (the majority in all three areas) believed that they knew of the rules and regulations around the permit system implemented by the DFRR (Figure 21). This law, implemented by the DFRR states that "you need a permit for commercial harvesting and not for subsistence harvesting. Subsistence is considered to be one bakkie load [roughly one tonne] or less while commercial harvesting is anything over one tonne" (Senior Forestry Officer, 29 March 2014, pers. comm.) Thirty seven percent of the respondents in Kasane were aware of the rule that certain products such as grass, fish and edible insects such as mopane worms, have harvest seasons and outside of these seasons, no harvesting is allowed. Fewer respondents, in all three settlements, were aware of the regulations stating that tree logging was prohibited, especially those trees that are endangered, and that certain areas have been declared no access zones by the DFRR. The police and the DFRR were believed to be responsible for this enforcement. In most cases the police would let the perpetrators go with a warning and often did not confiscate the harvested products. Only a few households said that they either did not know what the laws were or that there were no laws (Figure 21).

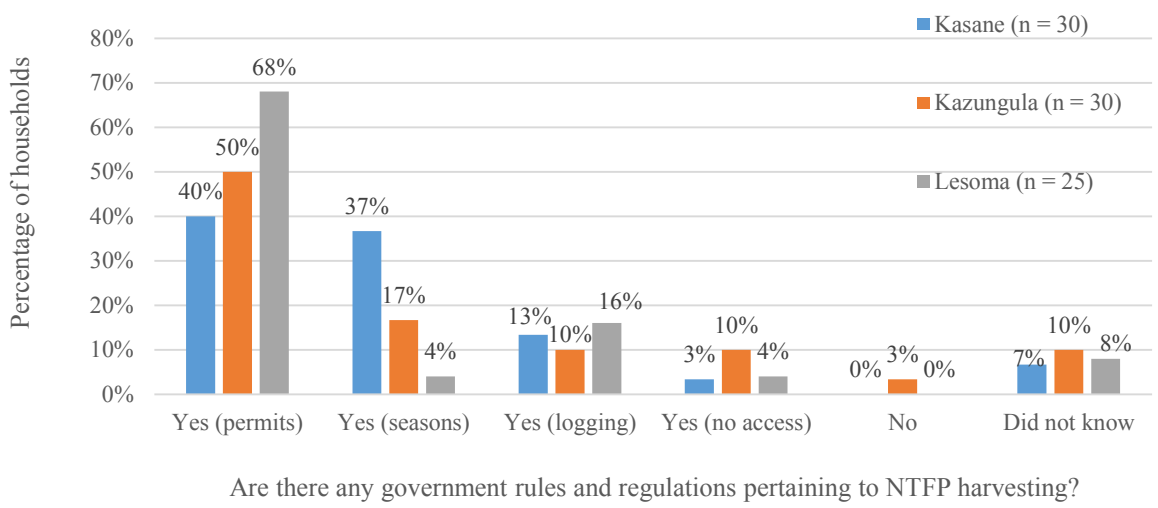



Figure 21: Knowledge about the rules and regulations pertaining to NTFP harvesting.

The majority of respondents (65%) in Kazungula thought that the government regulations were a good thing as they conserved NTFPs for current and future use (Figure 22). This same perception was reported by 44% of households in Kasane and 33% of households in Lesoma. A few respondents (8%) in Lesoma believed that the laws were positive as they did not prevent household harvesting and use of NTFPs as one did not need a permit for subsistence gathering. Conversely, the majority of respondents (58%) in Lesoma thought that the regulations were a problem as they prevented access to NTFPs and conflicted with community livelihood needs. The regulations were believed to help conserve natural resources and wildlife above the needs of the communities. Forty four percent of the respondents in Kasane also believed that the rules were negatively impacting on access to resources. "Many people suffer. Another one can't see the job, he stay alone and then he [the government] don't allow him to go into the forest to find the food in the bush and that's why he steals another person's something." (Respondent 76, Kasane, 23 March 2014, pers. comm.) As noted by the Senior Forestry Officer "…the government is saying don't use the resources but the people need them and so they feel like the government is preventing them." (Senior Forestry Officer, 29 March 2014, pers. comm.). Respondents believed that the laws did not allow for traditional conservation methods and that the closed harvesting seasons prevented households from accessing resources. These concerns were also noted by officers of the DFRR who noted that "the laws are too restrictive and people don't feel like they own the forest products as it's property of the government and so they don't conserve the resources as well as they could be." (Senior Forestry Officer, 29 March 2014, pers. comm.) The trust manager of a CBNRM initiative reported that there were currently no CBNRM projects dealing with forest product use as the strict rules and regulations around the Forest Reserves made it difficult for projects to be implemented.

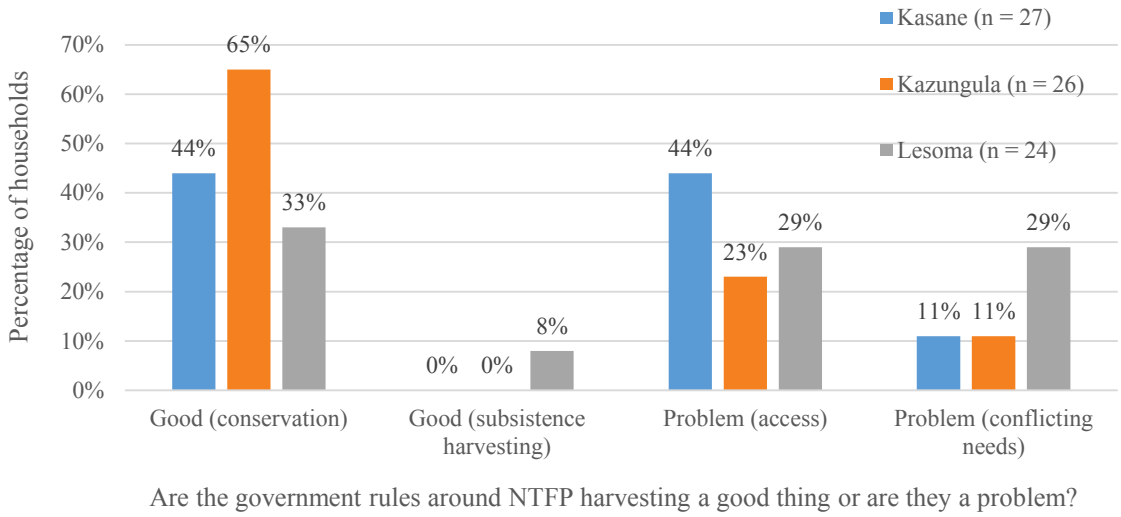



Figure 22: The perceptions of the rules and regulations around NTFP harvesting.

### *4.8 Traditional harvesting norms and practices*

The majority of households in all three areas mentioned the presence of traditional norms for the harvesting of fuelwood (Figure 23). These were that only certain tree species could be used for fuelwood. The cutting down, dragging and burning of some types of trees was believed to attract predators, enemies and conflict into the homestead. Some households noted that there were norms but could not describe these while others described beliefs such as women who have miscarried not being allowed to harvest wild fruits. The presence of these norms was in contrast to those noted by the Chief who said that there were no tribal rules and regulations around the harvesting of natural resources even though there were some traditional practices for harvesting such as when to harvest grass. More respondents in Kasane (47%) did not know what the traditional norms were compared to respondents in the other two areas (17% in Kazungula and 24% in Lesoma). This could be due to the loss of traditional knowledge, in an urban context, where households were relying less on NTFPs and therefore did not require traditional practices around the harvesting of these resources. Only four households in Kazungula and Lesoma believed that there were no traditional norms around harvesting.

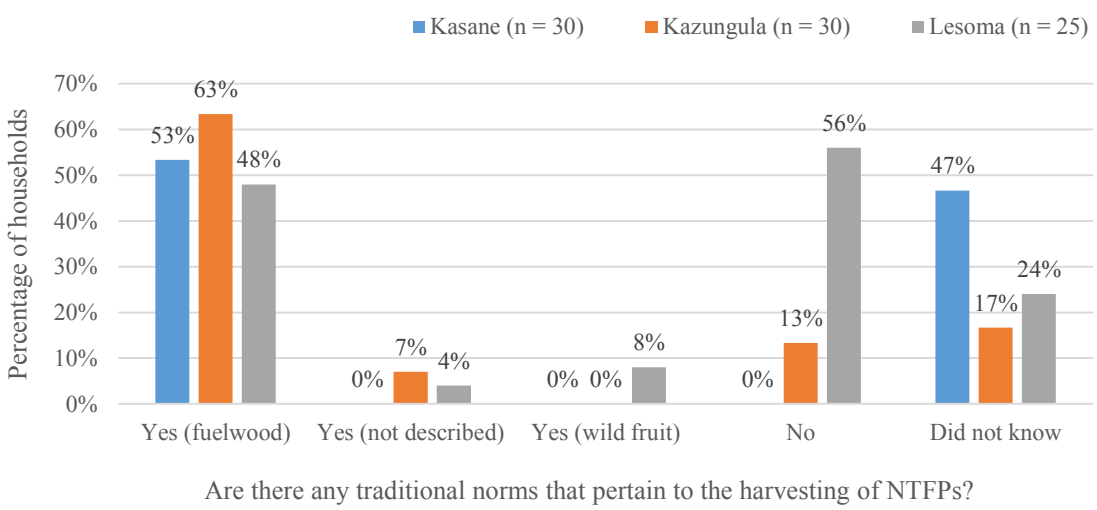



Figure 23: The knowledge of traditional norms around NTFP harvesting.

Fifty one percent of respondents, across all the settlements, believed that traditional norms were being enforced while 27% did not. Of the respondents that said that the traditional rules were being enforced, 38% of households believed they were being enforced by the elders of the area who were teaching norms to younger generations. Eleven percent of respondents said that these norms were being enforced within different tribes where some tribes were adhering to their traditional practices and passing them on to the youth.

The majority of respondents, in all three settlements, reported a perceived decrease in traditional practices pertaining to the harvesting of NTFPs (Figure 24). Ninety percent of respondents in Kazungula and 83% of respondents in Kasane believed traditional practices had decreased due to the shift to more modern lifestyles with an associated loss of indigenous knowledge and knowledge sharing systems. One household member remarked: “I didn’t teach him [his children] those things [traditional harvesting methods] because they are still in the school.” (Respondent 58, Kasane, 20 March 2014, pers. comm.) Perceptions of decreased traditions were reported by 60% of households in Lesoma which could suggest that there has been less of a move towards modern lifestyles in this more rural village. Other reasons given for the decreases in traditional practices included new religions such as Christianity, which did not allow for the use of traditional methods, as well as current government rules, regulations and policies which prevented traditional practices from being carried out. This loss of tradition was reiterated by the fact that 91% of respondents, across all three settlements, said that their elders used natural resources in a different way to how they were currently used. Older generations were reported to have used traditional practices more frequently, to have used forest products to construct their homesteads and to employ

conservation-orientated harvesting methods rather than harvesting for commercial gain. This had changed due to modern technologies, new religious beliefs and social transformation.

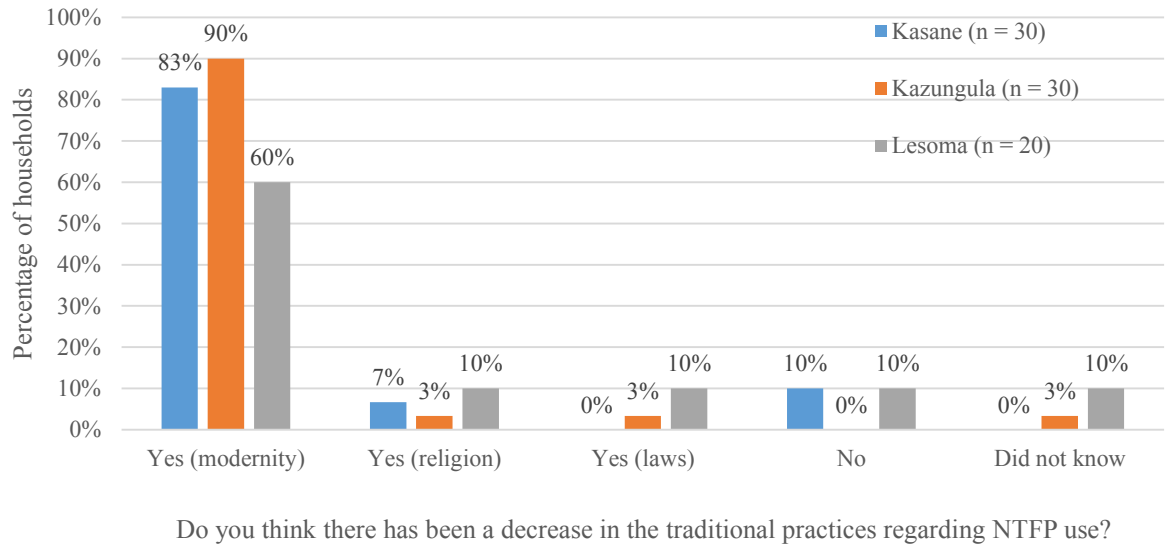



Figure 24: Household perceptions on whether there has been a loss of traditional knowledge around NTFP harvesting.

During focus groups with the youth, respondents were asked about their aspirations in order to try and understand the role that tradition might play on the future of younger generations. Many of the respondents said that they were hoping for a more urban lifestyle and that this would be achieved as their town continued to grow. This growth would make it more difficult to access NTFPs but it could also have helped to reduce the number of wild animals entering the homesteads. Respondents also said that they no longer followed or obeyed traditional practices and laws because of their exposure to science, technology and religion (especially Christianity) which refuted many traditional beliefs and led to more rational thinking. Although respondents noted that "civilisation" was inevitable, some remarked that this did not mean that people should abandon their cultural and traditional roots. A common response was that young people were being taught traditions by their grandparents, parents and other elders, especially that of traditional medicine use, and that they would continue to learn of these traditions even if they may not employ them. It was remarked upon that certain diseases could only be cured using traditional healing methods and so even with the advent of modern healthcare systems, traditional medicine use would continue to be practiced. The use of traditional medicines was regarded as important for social interaction and belief systems. This was in keeping with the findings of the household interviews where respondents opined that traditional norms were still present but were decreasing in practice as people moved toward more urbanised lifestyles. As one household member

remarked “and a lot of them [young people] don’t want to go out into the bush. They want to live in a town.” (Respondent 52, Kazungula, 18 March 2014, pers. comm.)

### *4.9 Urbanisation and the commercialisation of NTFPs*

In trying to understand the direct effects of urbanisation on NTFP use, households were asked whether they thought the rapid growth of their area affected the way in which they used NTFPs. Ninety one percent of household respondents believed that urbanisation had affected their resource use. The main reason for this was that as settlements expanded and more settlements were built in forest areas, fewer forest products were available and so respondents would have had to travel greater distances to harvest resources. Thirty four percent of respondents believed they would be affected by urbanisation as the increased population would lead to an increased demand for NTFPs with resultant over-harvesting and declines in resource availability.

There was not a large difference among settlements with respect to the commercialisation of NTFPs. All NTFPs noted in this study were bought by at least one household in varying combinations. The majority of resources bought were mats, hand brushes, waterlily and fish. Sixty percent of the households in Kasane, 37% of households in Kazungula and 32% of households in Lesoma had sold at least one NTFP. Higher proportions of households that sold NTFPs in Kasane could have been due to better access to market opportunities in this urban area. The majority of resources sold ranged from fish, waterlily, fuelwood, wild spinach, wild fruits, edible insects and palm leaf woven baskets. Twelve households sold wild fruits making it the most commercialised resource. Most NTFPs were informally sold by households to other people in the area.

The Senior Forestry Officer believed that NTFP commercialisation was a positive opportunity for communities, especially basket weaving and the sale of fuelwood. However, there was an insufficient market for the sale of natural products. The tourism development manager also remarked that commercialisation was a good opportunity but was not currently a predominant endeavour. He noted the need for the development of improved market structures that would allow people to reliably and safely sell their products. “So they [the community] can have access and they can use the forest reserve but the issue is once they get the products out, do they have the market locally or do they have…a developed system where they can sell even outside Chobe? … [E]ven the baskets, they get the leaves and they weave the baskets but there is no properly developed market for those baskets for tourists.” (Tourism Development Manager, 21 March 2014, pers. comm.) The Chief was similarly positive about the commercialisation of NTFPs as he noted: “As long as you have the correct permits, there are no laws preventing you from selling forest products… [I] think people should be encouraged to sell NTFPs and sometimes to improve their own livelihoods…” (Chief of Kasane, 25 March 2014, pers. comm.)

The lack of formal, or even informal, markets for NTFP commercialisation was observed during the market survey of lodge curio shops, formal curio shops and informal market stalls. Roughly 20% of one

curio shop had wood crafts made in Zimbabwe, South Africa and Kenya; 1% locally woven palm leaf baskets and 2% crafts such as jewellery and place mats made by women from Botswana. Another had a very small curio shop and an estimated 5% of the items being sold were wood carvings originating from Zimbabwe and Zambia. A third lodge had only 2% of locally crafted palm leaf baskets. Two lodges had no curio shops at all. This shows a small contribution of curios, or NTFP products, coming from local people and the lack of formal markets required for the sale of resources.

An informal curio stall comprised about 90% wooden carvings made by the owner of the stall, a Motswana man who learnt wood carving skills from his Zimbabwean father. The carvings were made from deadwood collected from in and around Kasane and Kazungula. The main trees used were teak (*Baikiaea plurijuga*), leadwood (*Combretum imberbe*), marula (*Sclerocarya birrea*), and mahogany (*Trichilia emetica*). Another stall comprised about 70% wood crafts sourced from Zimbabwe, Zambia, Kenya and Tanzania. Another 5% of the items sold were locally made palm leaf woven baskets. The owner of the shop said that tourists to the area like to buy locally made crafts but that these curios were not readily available. She also stated that "there is a problem getting wood as you aren't allowed to cut down trees and there is no market for women to sell their baskets and so they would rather go to Namibia to do so" (Market stall owner, 25 February 2014, pers. comm.). The last curio stall comprised roughly 95% wood carvings originating from Zimbabwe and Zambia. With the exception of some hand crafted baskets, most of the NTFP products came from foreign countries.

The informal market in Kasane had roughly 10 to 15 stalls with every stall selling wild spinach. Four of the stalls were selling palm leaf woven baskets that had been made by the stall vendors themselves. One of the stalls sold an insect grub while another sold dried mopane worms that had been sourced from Francistown. Another stall sold grass hand brushes and reed mats produced from materials collected in the surrounding area. Another stall was selling locally made wood carvings. These informal market stalls were an example of how local NTFPs could be sold even on an informal and small-scale basis.

Twenty seven percent of respondents believed that better government controls could be a way of addressing the barriers to resource harvesting, where rules against over-harvesting could be implemented more effectively. Other respondents believed that the government rules needed to change. For example, through reversing the current hunting ban, households could once again benefit from bushmeat and hunting could act as an animal population control measure. Twenty three percent of households thought that NTFP rules and regulations should do more to benefit the communities. Seventeen respondents believed that better public education would benefit communities as they could be taught conservation laws and how and why regulations should be upheld. Other solutions proposed were changes in land-use policies, relocation of wild animals, increased electricity use and the increased preservation of harvested resources. Eleven percent of respondents said that there was nothing that could be done.

In summary, the majority of respondents were middle-aged females and most respondents came from outside of the area in which they were currently living. Most respondents, in all three settlements, had reached a secondary school level of education and the highest rate of employment was seen in Lesoma. Households interviewed mostly used a combination of fuelwood and electricity for their energy needs. More households in Lesoma used NTFPs than the other two areas but there was still a high reliance on NTFPs in Kasane and Kazungula. The main resources used were food items, fuelwood and grass for hand brushes. NTFPs, such as bushmeat and those requiring skills for processing, were not used by most households in all the settlements. The same findings were true of the focus groups. DFRR permits were mostly issued for fuelwood, trees, and palms (excluding the unusually high numbers of permits authorised for grass harvesting and bird hunting in 2012). The five most important resources, across all three settlements, were fuelwood, fish, wild spinach, wild fruits and waterlily. Of these five resources, food items were used seasonally and fuelwood was used all year round and the majority of all resources were collected from the bush in and around the settlements.

Respondents in Kasane and Kazungula would have liked to be less reliant on NTFPs while in Lesoma, respondents would have liked to rely more on resources. Many of the households believed that they had restricted access to resources due to strict government rules, conflicts with tourism goals, reduced resource availability and the presence of wild animals and soldiers in the harvesting areas. Most of the households interviewed knew of some government rules and regulations as well as traditional harvesting practices. The majority of respondents in Kazungula believed the government rules to be positive while respondents in Kasane and Kazungula believed them to be a problem, mostly because the rules restricted access to resources. The majority of respondents said that the traditional practices had decreased mainly due to modern lifestyles and urbanisation. The lack of formal market opportunities for resource commercialisation meant that most traded resources were sold informally. But there was the strong opinion, amongst the key informants, that the commercialisation of NTFPs was a good opportunity for community development.

# 5. Discussion

## *5.1 Urbanisation and NTFP use*

One of the most significant findings of this research is that the majority of households, in all three settlements, reported the use of foods (fish, wild spinach, waterlily and wild fruits) and fuelwood. This suggests that household use of NTFPs does not decrease considerably with increasing urbanisation. Even though households in the urban areas of Kasane and Kazungula used a less diverse range of NTFPs than those in the rural village of Lesoma, they still reported use of a range of resources including wild fruits, fish, wild spinach, fuelwood, waterlily, grass for hand brushes, reeds and edible insects. The diversity of resources used in this region supports research done in other parts of Botswana, South Africa and Zambia where harvested resources, from rural villages, included fuelwood, wild fruits and other food plants, mopane worms, grass brushes and medicinal plants (Arntzen 1998; Shackleton & Shackleton 2006; Mutamba 2007). A recent study conducted by Schlesinger *et al*. (2015) found that in six smaller cities around Africa, 87% of all the households interviewed used at least one wild NTFP. The research also notes that households in the town of Palapye, in Botswanan, used fuelwood, wild fruits, wild vegetables, edible insects and traditional medicines. Findings which affirm the results of this current research.

In the present study, over 90% of households, in all the settlements, believed that urbanisation had directly affected their use of NTFPs through its impacts on habitat loss and decreased resource availability but, significantly, no one raised the issue of a decreased reliance on NTFPs due to urbanisation and improved access to alternatives. These findings contradict the commonly held belief, articulated by Nkambwe & Sekhwela (2006) and others, that households located along the rural-urban continuum have distinct contrasts in livelihoods, lifestyles, economic activities and natural resource use. Many of the households interviewed in Kasane and Kazungula also noted that although they did not regularly use forest resources in their urban houses, they did use these resources back in their rural home villages. This finding resonates with research done by Wehi & Wehi (2009) where households in New Zealand harvested wild foods, medicines and local craft-making products both from public urban sites and from rural, communal, tribal resources.

The use of NTFPs to support livelihoods in both urban and rural contexts supports Tacoli's (1998) notion of 'multi-spatial' households. As Shackleton *et al*. (2000) noted, most households in southern Africa rely on a range of activities and resources whether they are considered rural or urban. Indeed, even though people are increasingly attracted to urban areas and lifestyles, many still have strong cultural ties to nature and their home villages (Dold & Cocks 2012). Gugler (2002) found that for many households in Africa, the connection to their rural homes provides people with some safety in a political economy that does not always provide the financial security expected by urban populations. Indeed, as Bah *et al*. (2003) remark, the increase in urban food prices and service charges have often been felt by

low-income households and this has led to changes in livelihood strategies including strong social and economic links to rural homesteads and higher levels of multi-spatial activities, such as NTFP use.

It is interesting to note that the predominant resources used by respondents in all three settlements and in the focus groups were foods such as fruits, fish, wild spinach, waterlily, edible insects and mushrooms. This finding supports research done by Schlesinger *et al*. (2015) and Kaoma & Shackleton (2014) where urban and rural households around Africa and in South Africa, respectively, used mainly fuelwood and wild foods, namely vegetables and fruits. In a global study conducted across 24 developing countries and reviewing environmental income and rural livelihoods Angelsen *et al*. (2014) concluded that food, such as bushmeat, fish, fruits and vegetables, was the second most important resource harvested by communities. This reliance on 'wild' food resources, which are reportedly often seasonal, could be problematic for household food security during times when these food items are not available. In contrast, Porro *et al*. (2015) found that in Peru there was little relationship between forest product dependency and poverty. In fact, Angelsen *et al*. (2014) found that, globally, more well-off households used more environmental resources than poorer households. Therefore households in Kasane, Kazungula and Lesoma might have harvested these foods as a taste or cultural preference rather than out of necessity. In research done by McLain *et al*. (2014), for example, people living in various cities in the USA, foraged edible plants and fungi within the cities themselves and foraged mainly for enjoyment rather than for survival. Although the relatively affluent context for this finding is different to the situation in Botswana, which is characterised by high levels of poverty, it suggests that the value of wild food to food security, diets, nutrition, culture and income can be significant even though it has not yet been thoroughly explored (Dold & Cocks 2012).

Another point of interest in this study was the high reliance of most households on fuelwood which ranked as the most important NTFP by the majority of households. Most of the households interviewed used both electricity and fuelwood or fuelwood only for their energy needs, showing a high dependency on this resource especially when electricity was unavailable. This affirms the importance of fuelwood as an energy source for many households in Africa (Dovie *et al*. 2004; Malimbwi *et al*. 2010; Kaoma & Shackleton 2014; Schlesinger *et al*. 2015) and indeed globally (Angelsen *et al*. 2014). Nkambwe & Sekhwela (2006) noted that woody biomass accounts for over 60% of the total energy needs for Africa and for over 90% of household use in sub-Saharan Africa and that the use of wood products can decrease the cost of energy, building materials and social events. A study done in Bushbuckridge in South Africa showed that 96% of interviewed households used fuelwood all year round (Dovie *et al*. 2004). Malimbwi *et al*. (2010) found that access to commercial energy sources in Botswana is low and so fuelwood is the main source of fuel. However, they also noted that as wood becomes scarcer, people will have to travel further in order to harvest it, making those households who are dependent on fuelwood increasingly disadvantaged. This is cause for concern given that wood resources are declining in many parts of Botswana, especially in communal land areas (Central Statistics Office 2004).

Traditional medicine is another resource that is often found to be used by people living in both rural and urban areas. The World Health Organisation (WHO) has estimated that around 80% of all Africans use some kind of traditional medicine and with increasing population rates, unemployment, urbanisation and HIV/AIDS, the (mostly) informal trade in traditional medicines is extensive, and growing (Dold & Cocks 2012). Research findings from this study show that 47% of households in Kasane, 30% of households in Kazungula and 56% of households in Lesoma reported using traditional medicines. This supports research which shows that the use of both modern and traditional medicines alongside one another is still prevalent in both rural and urban areas and among all socio-economic groups (Dold & Cocks 2012; Petersen *et al*. 2012; Schlesinger *et al*. 2015). Petersen *et al*. (2012) noted that 52% of resources harvested within the city of Cape Town, South Africa, were for medicinal –purposes. Dold & Cocks (2012) found that in the Eastern Cape of South Africa, the Xhosa people mostly purchased or used traditional medicines to ward off evil spirits, to give luck and to act as a purgative to cleanse the blood. This supports the findings in this case study where respondents in the focus groups used traditional medicines for the same reasons.

Despite the evident use of NTFPs in the urban context of this study, the distinction needs to be made between those households that used NTFPs as a cultural practice related to their traditional backgrounds and links to their rural villages; and those households who depended on NTFPs as they were too poor to rely solely on urban activities to meet their livelihood needs. In this study respondents in Lesoma, who have the lowest average total household income (Lepetu *et al*. 2012), felt that they would like to be using forest resources. However, the desire to use fewer, and be less reliant on, NTFPs was expressed by most households in Kasane and Kazungula as respondents would rather be using urban resources such as electricity and modern healthcare and services. This supports the findings of Tacoli (2003) that wealthier households tend to utilise both rural and urban resources as accumulation strategies while poorer households (such as the households in this case study) often negotiate the rural-urban continuum for survival. As well as this, the loss of traditional knowledge in many urban areas means that people no longer know how to perform traditional activities and are therefore using NTFPs out of necessity rather than for any cultural significance.

### *5.2 Loss of traditional/indigenous knowledge*

Apart from bushmeat, the resources that were not being used by many households, across all three areas, were those requiring processing and skills such as woven palm leaf baskets, wooden household utensils and carving, and beer made from wild fruits. This could suggest either a general lack of skill amongst the respondents living in these areas due to a deterioration in the traditional knowledge systems needed for acquiring the relevant expertise; or because people no longer rely on NTFPs but rather on cash-bought, alternative products. Shackleton *et al*. (2010) found that fibre products, such as reed mats and baskets, have mostly been replaced with alternative products such as cloth and plastic. A study done in south-eastern Nigeria by Bah *et al*. (2003) noted that traditional, rural activities such as cloth weaving

had decreased due to competition from cheaper imports and inadequate infrastructure. In this study most households, in all three settlements, no longer make, or use, baskets and those who have reed mats have bought them from local manufacturers.

Although most of the respondents in all three areas knew about traditional norms around the harvesting of fuelwood, the majority of households also believed that traditional practices and norms had decreased due to modernity and urban lifestyles. Similarly, Lepetu *et al*. (2012) note that traditional practices are often placed under increasing pressure by urbanisation, population growth and migration with a breakdown in cultural and, or family cohesion. Dold & Cocks (2012), however, suggest that even in highly urbanised areas, traditional practices and customs continue to be significant. This finding contradicts the results of this research which revealed that even though people knew of these traditions, the majority of households no longer felt that these practices were being carried out or were significant to their livelihoods. Turner *et al*. (2008) note that there has been an erosion of traditional knowledge systems and loss of intergenerational transmission networks through indigenous languages and ceremonies. In this case study, 38% of respondents believed that cultural norms were being passed on to younger generations by tribal elders. But despite this knowledge sharing, the young respondents of the focus groups reported that although they were being taught these traditional practices, they no longer adhered to them as they aspired to live more urban, modern lifestyles. Mbaiwa (2010) also found that young people in the Okavango Delta were no longer interested in traditional or cultural practices.

### *5.3 Barriers to NTFP access*

The majority of households in both Kasane and Kazungula believed that they had limited access to resources due to the restrictive nature of the DFRR permit system and due to the presence of wild animals and soldiers in harvesting areas. Despite the perceived restriction to resource access households in all three settlements still utilised NTFPs. This suggests that there must be some shortfall in the effective provision of goods and services if respondents are having to rely on resources that they would prefer not to be using. On the other hand, the desire to use more NTFPs, expressed by respondents in Lesoma, raises important policy questions. The barriers to resource access need to be addressed in order to ensure people are able to perform daily functions required to meet their livelihood needs while balancing this with conservation and sustainability goals. As Folke *et al*. (2002) have noted, the conservation of natural wealth, which provides vital ecosystem services and natural resources, is important in the future as it is often a key livelihood option and without it, sustainable livelihoods may not be attainable.

An important institutional facet affecting access to and management of natural resources is the tenurial situation of these resources, be it communal, private or state protected land (Shackleton & Gumbo 2010). A study done by Clements *et al*. (2014) found that protected areas in Cambodia did not disadvantage local households. However, in this case study both ‘wild’ food and fuelwood were

harvested from a range of locations but there were very few resources harvested from within the state-owned Forest Reserves. Lepetu *et al*. (2012), conducting research in Kasane, noted that 54% of households used fuelwood harvested from the Forest Reserve. In this study, however, it was revealed that by limiting access to areas such as the Forest Reserves, increased harvesting pressure was placed on communal, open access areas around the settlements. This could be increasingly detrimental to resource availability in these areas. As Kaimowitz (2003) suggests, the loss and degradation of forests, a decrease in access to these forests and stagnant markets are some of the major threats to forest resource use. In this case study, most of the respondents thought that the major threats to natural resources were overharvesting and environmental destruction by wildlife.

An additional barrier to NTFP access was the lack of market infrastructure in Kasane which limited the scope for commercialisation of resources. Belcher *et al*. (2005) found that NTFPs are most often used for subsistence purposes but in some cases are traded as a means of earning extra income. In this case, the majority of households, in all three areas, used NTFPs for subsistence purposes only. Although this study did not investigate household's wealth status, this finding could point to the potential lack of market facilities for the sale of NTFPs as in Kasane, the few households who were selling NTFPs were doing so in an informal manner by mostly selling directly to other households. The market survey done shows that there was limited access to formal, or even informal, markets and this could be why the sale of NTFPs in this area was not more evident.

The high number of tourists in Kasane could be a potential market for crafts such as wood carvings and baskets. Research conducted by Shackleton *et al*. (2007) found that in South Africa, tourists were the number one buyers of local crafts. However, interviewed households in this study reported a low use of resources for crafts as they lacked the materials as well as the necessary skills required to make these crafts and to then sell them. As Belcher & Schreckenberg (2007) have noted, trade in NTFPs typically requires a basic set of expertise and assets and often poor people do not have these and so it is difficult for these households to move beyond harvesting for subsistence purposes alone. Belcher *et al*. (2005) found that of the 61 case studies looked at in Africa, Asia and Latin America, the households harvesting for subsistence purposes would harvest low-value products with local processing within the households themselves. These products included palm fibres, low-value wood carving, fuelwood and medicinal plants. This and the findings of this case study are also supported by a study conducted by Blaikie (2006) in a another town in Botswana that found that making crafts for the tourism industry has not encouraged local skills development nor has it led to a substantial income for the local communities. Kaimowitz (2003) noted that in many areas of sub-Saharan Africa, the markets for particular traditional NTFPS, such as baskets and mats, have become saturated or are shrinking as the slow growth in per capita income prevents the expansion of these markets for better quality NTFPs that require more capital and skills.

A further access barrier, perceived by interviewed households, was the negative impact of tourism on NTFP use. In this study, over half of the households interviewed believed that tourism, although an important income source, often conflicted with community needs. This belief affirms the findings of Mbaiwa (2011) that tourism, especially in developing countries, has been encouraged as a development approach that can increase employment levels, generate foreign exchange, attract development capital, improve GDP and create modern lifestyles based on western values. However, many consider tourism a threat to traditional practices and lifestyles. Tourism is the second largest GDP earner in Botswana and the northern parts of the country are high-quality tourist areas (Barnes 2001; Statistics Botswana 2014). Despite this the tourism industry in Botswana is believed to have been exploited by foreign investors who often make little effort to employ local people or to develop local skills (Blaikie 2006). This is supported by the findings in this study, where households did not feel like they were benefiting from tourism endeavours.

Another negative impact of tourism was that the conservation of animals for the purposes of tourism meant that households could not safely access resource harvesting locations. Eighty nine percent of households, in all three settlements, reported that wild animals hindered their access to NTFPs. However, the game animals in this area are important for both conservation and as a revenue source through tourism in the area. The need for soldiers, especially anti-poaching units, in state protected areas such as the Forest Reserves, also meant that respondents did not feel safe when harvesting resources for the fear of being apprehended by armed forces. A study done by Cock (2004) found that people in Durban, South Africa, believed military activity to be one of the most destructive environmental forces. This provides an interesting quandary as conservation objectives and the use of on-the-ground, military presence in ensuring these objectives are important management policies but at the same time these regimes are hindering local livelihoods and the potential development of sustainable communities. In order to try and address this problem, the new ecotourism management plan is going to be implemented in the next few years and this will 'open' the Forest Reserves to community members wanting to engage in ecotourism ventures in an attempt to make tourism more beneficial to local people. This, and the current hunting ban, will also encourage non-consumptive tourism which can be the most beneficial kind of tourism (Barnes 2001). As Shackleton *et al*. (2007) have found, ecotourism can provide an important solution to the planning and subsequent management of natural areas and their resources.

Some of the solutions to the barriers of access to NTFPs, expressed by households in all three settlements, included a change in the government rules and regulations, such as reversing the hunting ban, as well as trying to include community opinions and traditional practices into the decision making process. Better public education about the current conservation laws and the effects of overharvesting was another solution. As McKinney (2002) noted, public education could be one of the most effective tools of promoting conservation.

### *5.4 NTFP governance*

The majority of respondents, in this study, were aware of government rules and regulations around NTFP harvesting such as the DFRR permit system, the closed harvesting seasons for certain products, the ban on tree logging and the demarcation of no access zones. Many cases around the world, however, suggest that natural resource governance has tended to be hierarchical, technocratic and biologically focused and has not proved effective in dealing with the complex nature of resource use (Laird *et al*. 2010; Lepetu *et al*. 2012). Such laws, especially those concerning forest management, have usually not been directed at NTFP use but have rather often promoted timber management, ecotourism and ecosystem services (Pierce & Bürgener 2010). This study similarly revealed that despite recognition of rules and regulations, over half the households interviewed in both Kasane and Lesoma believed the laws were a problem as they either prevented easy access to NTFPs or conflicted with community needs and livelihoods. As some government officials noted: "the laws are too restrictive and people don't feel like they own the forest products as it's property of the government and so they don't conserve the resources as well as they could be." (Senior Forestry Officer, 29 March 2014, pers. comm.). Pierce & Bürgener (2010) note that this is the reality in many cases where rules put in place to control natural resource use are overly strict and restrictive. A global study done by Jagger *et al*. (2014) also found that state-owned forests tend to have moderate enforcement regimes and this enforcement is strongly associated with reduced resource access particularly for subsistence harvesters. In the present study, the DFRR permit system controlling the state-owned forests was considered highly restrictive due in part to the loose categorisation of what was considered subsistence harvesting as opposed to commercial harvesting. This in turn meant that subsistence harvesters were unduly reprimanded. As Kaimowitz (2003) notes, the government policies around forests and their resources often tend to favour elite groups who have access to concessions, permits and good transport and road systems as opposed to many poorer local inhabitants. In this case, the elite groups tended to be tourist operators and government-led institutions.

The implications of restrictive rules and regulations could lead to an increase in conflict between government structures and local communities and perhaps an increase in illegal harvesting methods which would then make it difficult for resources to be properly managed. As these rules prevent access to resources, they could also lead to a loss of an important livelihood option for many poorer households in both these urban and rural areas. A revised system of governance in these three settlements could thus be useful for forest resource management. This could involve a whole range of actors, rather than one over-arching government, including citizens, organisations and other stakeholders leading to more decentralised and evenly distributed power (Lockwood *et al*. 2010).

Another facet of natural resource governance is that of traditional norms, laws and practices. As Hayes (2006) found, there are local, traditional rules in place that influence resource conservation and run side by side with statutory rules. However, as has been reported, the decline in adherence to traditional laws and practices is evident in the urban contexts of Kasane and Kazungula where 90% and 96% of respondents, respectively, felt that traditional practices had declined due to social change. This suggests that the negative impacts on indigenous knowledge systems were felt more by households living in an

urban context. This again reiterates the negative effects of urbanisation on traditional lifestyles and livelihood sustainability. This finding is supported by Chamberlain *et al*. (2004) where studies from around the world have shown that traditional laws have often been eroded by urbanisation, cultural and social transformation and increasing demands for resources. Gwebu (2002) noted that historically in Botswana, the main aspect of the chief's control over spatial organisation was his supervision of productive resources, such as wild trees and other vegetation, especially on communal land where no-one could claim any rights over natural vegetation and so resources were equally available to all tribe members. The respect held for both spiritual and communal authority meant that collective monitoring and community obedience ensured the conservation of most NTFPs. However, the changes in common property rights, including social transformation, land commodification, private ownership of land and appropriation of valuable resources by colonial and post-colonial governments, have eroded local rights and practices. Since independence in 1966, chiefs have lost most of their authoritative functions including a loss of control over natural resources. In this study, the Chief of Kasane reported that there was no traditional governance of resource harvesting.

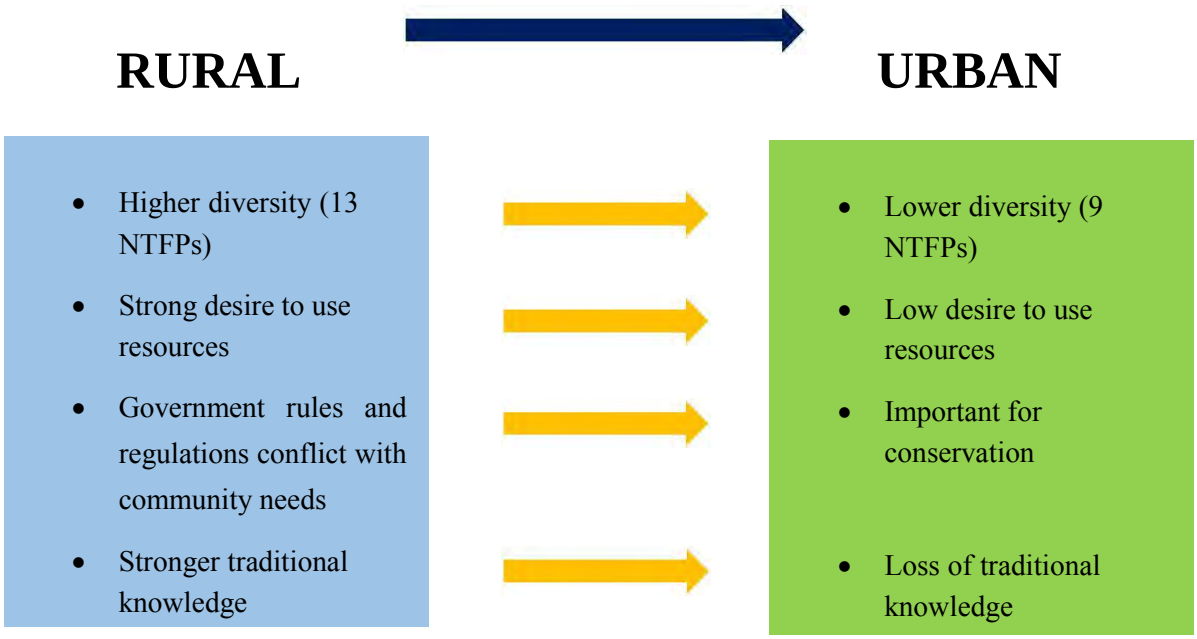
About ten percent of households in the rural village of Lesoma, felt that the current government rules and regulations prevented them from performing their traditional practices. Although this is not a large number of respondents, it does suggest that government laws may be prohibiting traditional practices to some extent. This suggestion supports research by Turner *et al*. (2008) who note that the enforcement of external rules and regulations has meant that people's cultural values and practices are prohibited thus preventing them from performing activities that are fundamental to their traditional lives. Nakashima (2000) and Cocks (2006) also remark that indigenous communities tend to value nature differently from ecologically trained conservationists and the response of many biophysical scientists is to extract that traditional knowledge that may be useful to western science principles with the rest being cast off as 'superstition and belief'.

Another reported issue was that the state laws did not include traditional governance systems in their management protocols. As noted by Matsa & Mutekwa (2009), government and private property management systems often do not take account of local, traditional and often complex resource use practices. This is seen in the current forestry laws of Botswana, under the 2005 Forestry Act, which do not incorporate traditional laws into their management systems. The lack of inclusion of traditional practices in government laws suggests that the low influence of local people and their lack of tenure security means that they do not have the necessary avenues for promoting the inclusion of traditional laws into government management regimes (Belcher & Schreckenberg 2007; Laird *et al*. 2010). The implications of the loss of traditional knowledge systems, especially with the advent of growing urbanisation in these three areas, is a difficult issue to deal with. The decline in cultural capital could have negative consequences for poor people in the future, particularly in the urban context where

poverty is rife. It could also mean that effective rules and regulations cannot be developed as most laws benefit from the inclusion of indigenous knowledge regimes.

### *5.5 NTFP use and access along the rural-urban continuum*

The findings of this research show that in many ways urbanisation has had little effect on the use of, and access to, NTFPs in these three areas. Forest resource use is evident in all three settlements despite the level of urbanisation and the use patterns of these resources are similar. The perceived barriers to resource access, particularly restrictive government rules and regulations and wild animals, are common to households in all three areas. The loss of traditional knowledge is most apparent in urban areas but respondents in all three settlements believed that traditional practices had decreased due to urbanisation. The following figure (Figure 25) provides an overview of the findings of this case study and shows resource use, and access, along between the rural and urban study settlements.




## Common trends

### NTFP use

……...Use of NTFPs…….

……....Use of fuelwood and wild foods……..

……..Low skills base to process resources……..

…….Harvesting within and around settlements……..

### Barriers to resource access

……Conservation goals and tourism interests……

……Wild animals and soldiers in harvest locations……

……..Decreased resource availability…….

### Governance

……Government rules and regulations hinder resource access……..

……Traditional knowledge loss due to urbanisation……..

Figure 25: An overview of NTFP use and access between rural and urban areas.

# 6. Conclusion

This research set out to determine the use of, and access to, NTFPs in three settlements with differing levels of urbanisation. One of the major findings of this research was the significant use of these resources in all three settlements. Although households in rural Lesoma used a wider range of resources, households in Kasane and Kazungula also utilised a variety of forest resources despite the extent of urbanisation in these areas. The use of NTFPs is often thought to occur predominantly in rural areas but the research presented here suggests that this activity could be an important livelihood option in urban areas as well. The use of NTFPs by the majority of urban households interviewed could be due to the strong cultural linkages between urban and rural areas, or to the reality that poor urban households are not able to meet their livelihood needs and so have to rely on NTFP use to survive.

The majority of resources used in all three areas were fuelwood and foods such as fish, wild fruits, wild spinach and waterlily. Resource harvest locations varied but households commonly harvested resources from the bush in and around the settlements. Few households harvested resources from the sate-owned Forest Reserves. The products were used at varying times of the year with the majority of households using the 'wild' foods seasonally and fuelwood all year round. The similarities in use patterns, across the settlements, are interesting and suggest that households in both urban and rural contexts are relying on similar resources for similar purposes. This could be a result of shared preferences or because households in both contexts are suffering from common shortfalls in income opportunities and service provision and are therefore having to rely on NTFPs as a necessary livelihood option. A difference between areas was the wish to use either more, or fewer, NTFPs. The majority of households in the more urbanised areas of Kasane and Kazungula expressed the desire to be less reliant on, and to use fewer, NTFPs. The main reasons given for this were that respondents would like to be conserving resources and to be using modern conveniences, such as store-bought food and electricity, instead. Contrary to this, households interviewed in rural Lesoma wished to use more NTFPs but there were barriers preventing them from doing so.

The similarities between the areas are also evident in the finding that the majority of households, in all three settlements, used NTFPs for subsistence purposes. The only evidence of trading of resources was seemingly done on an informal, ad hoc basis with products sold directly to other households in the community. It was expected that the commercialisation of NTFPs, such as crafts, would be apparent in Kasane, and even Kazungula, due to better market infrastructure but there were very few resources being sold by the households interviewed. Many households interviewed also reported a general lack of skill required for craft production due to a loss of traditional craft making practices. Therefore one of the benefits of urbanisation, access to markets, was not evident. Key informants believed that the commercialisation of NTFPs was an important livelihood opportunity for these communities.

Other factors influencing the use of and access to NTFPs, in the context of urbanisation, were the restrictive nature of the government rules and regulations and the conflict between community needs and conservation/tourism objectives. Households in all three areas were knowledgeable about government rules and regulations, and the DFRR permit system in particular, but the rules were thought to be restrictive. Respondents in Lesoma also believed that the rules prevented commercial harvesting and thus precluded a move away from subsistence gathering. In Kazungula, however, respondents believed subsistence harvesting to be easy and unrestricted. In an apparent contradiction, the DFRR authorities interviewed also believed that the current government laws were too restrictive. Such findings suggest that these policies need to be re-considered to be more accommodating of livelihood needs. The prioritisation of conservation goals for tourism interests, was also perceived as a barrier to resource access. The majority of households in all three settlements believed that the presence of wild animals and soldiers in harvesting areas, for the sake of conservation, hindered resource harvesting.

Although there were commonalties between the settlements with regard to resource use and access, the extent of traditional knowledge loss was found to be greater in the urban environment, with many households in Kasane unaware of any traditional norms around the harvesting of resources. The main reason given for this trend was that urbanisation, and a move toward modern lifestyles, was eroding traditional norms and practices. The loss of traditional knowledge was believed to be a reality for the majority of households interviewed in all three areas but the realisation of this loss was most evident in Kasane. This degradation of indigenous practices and knowledge could pose potential problems for improved, collaborative management and policy decision making as the integration of traditional knowledge into this process will be hindered if the knowledge is not actually present.

A central conclusion of this thesis is that there are evident similarities in NTFP use and access despite levels of urbanisation. The evidence has shown that households in Lesoma use a wider variety of NTFPs and for some resources, a much higher percentage of households use these resources but there is also evidence that households in Kasane and Kazungula do still harvest and use NTFPs. The purposes of resource use showed also showed little difference. The restrictive nature of government rules and regulations was a barrier to resource access for the majority of households interviewed, in all three areas, as was the perceived conflict between community livelihood needs and conservation goals for tourism purposes. Access to markets in urban areas had little impact on the extent of NTFP commercialisation. A chief difference between areas was the loss of traditional knowledge, with households in the urban town of Kasane demonstrating a greater lack of knowledge regarding indigenous practices and norms.

Based on these findings, the following recommendations are made:

1. Further investigation into the reasons behind NTFP use should be undertaken. This could help to determine whether households are using NTFPs out of preference or as a survival strategy due to

difficulties in accessing urban resources. If the majority of households are using NTFPs as a survival strategy, then more effort needs to be made to ensure that people can access urban resources and services. This could be done through improved education systems where better education leads to improved employment opportunities and increased capacity to know how to access relevant services. Public investment in improved employment opportunities and the encouragement and facilitation of self-employment ventures are also important research areas that require serious consideration.

2. Co-management of the areas used for NTFP harvesting, should be explored as a potential option for NTFP policy. This could include actors such as local user groups, governments, non-government organisations and private stakeholders. Where possible, these management processes should also incorporate traditional knowledge practices to produce flexible and multi-level governance systems. Decision-making meetings could be held with the DFRR, private stakeholders and local representatives and village chiefs, so as to make sure that all interested parties have a say in the management of the harvesting areas surrounding the settlements. These co-management plans must also be implemented for areas where both NTFP harvesting and other uses of these resources are being utilised so that all stakeholders can benefit from more profitable uses of these areas such as commercial resource production. Administrative powers, that were previously diminished, could be re-instated to the chiefs of each area to improve local governance and tribal customs, if present, could be incorporated into beneficial rules and regulations.

3. One solution could be for governance structures to look at improving market infrastructure to try and provide another livelihood option for local people and to encourage the development of cottage industries based on traditional crafts, practices and sustainable usage patterns. Most of the key informants interviewed in this study thought that the commercialisation of natural products was a positive route to improve local livelihoods as this could provide employment opportunities for people who are not highly qualified and who do not have lots of capital to start up a business. The establishment of improved market stalls in a prominent location in Kasane and Kazungula could encourage the sale of NTFPs such as foods, medicines and crafts, to both tourists and local people. Such a strategy would need to be accompanied by a clear plan to ensure resource sustainability as well as the necessary training for those people who would like to trade in NTFPs but lack the skills to produce sellable items.

4. Urbanisation and the concurrent loss of traditional practices necessary to make crafts could also be addressed. Traditional skills and craft centres could be established where resident, interested people are taught local craft making and further resource harvesting and processing by those community members who still possess the necessary expertise. This will provide both employment and preserve traditional customs. These initiatives could be set up by either local communities themselves, NGOs or government institutions, or through collaborative efforts from all three parties. These initiatives would need to be set

up alongside improved market facilities for the sale of these resources.

5. In the case of Kasane, Kazungula and Lesoma, alternative livelihoods, such as ecotourism, could be pursued. Tourism, and a concomitant focus on conservation objectives, is a major contributor to development, economies and employment in northern Botswana and the study area for this research. This is especially relevant in the context of urbanisation in this region as it provides a more sustainable plan for effective conservation where urbanisation is often placing huge pressures on natural resources. Urban people also often need formal employment opportunities as they are living in a cash-based system and these opportunities can be provided through ecotourism ventures. Tourism ventures such as birding, guided nature walks, game drives and botanical outings could be an alternative way of using the Forest Reserves for non-consumptive tourism and could also provide employment for local forest users. The new ecotourism plan, intended for the management of the Forest Reserves, will hopefully be effective in both conserving natural resources and improving benefits from tourism for the local communities. There are some tourist initiatives which have been implemented to try and directly benefit communities and these should be supported and expanded. Forest Reserves offer an important opportunity for the establishment of these sorts of projects.

6. CBNRM trusts and organisations can also be beneficial in trying to get ecotourism and NTFP projects set up in the Chobe region. Some of these enterprises could include solar energy projects and tree-planting initiatives. Even though there are currently no CBNRM projects dealing with forest product use, there are programmes that are working hard to come up with a conducive environment for collaboration with local authorities and are moving away from consumptive tourism (e.g. hunting) to non-consumptive tourism (e.g. photographic and walking safaris). These programmes should be encouraged to help ensure the sustainability of resource use for both livelihood and conservation purposes. Despite the failures in the current CBNRM programmes there is still the potential for effective community-based involvement in resource use and management and these avenues need to continue to be explored.

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# Appendices

### Appendix 1: Household Interview Questionnaire

University of Cape Town

Stephanie Joos-Vandewalle Masters Project Data Collection

Changing natural resource dependencies in a rural/urban context.

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Date: ……

Questionnaire number: .....

GPS Co-ordinates:……

**Has the informed consent form been signed by the participant? Yes/No**

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1. Age/Gender:
2. Birth place:
3. Level of education:
4. Employment of the respondent: [ ] unemployed [ ] self-employed [ ] pensioner [ ] formal job
5. How long has your household lived in this village? Since _____/ ..... years
6. Who is the head of this household? [ ] Resident married male [ ] Married male working away [ ] Single/divorced/widowed female [ ]Single/divorced/widowed male [ ] Son [ ] Other
7. Household size: [ ] <5 [ ] 5-10 [ ] >10
8. What do you use for power? [ ] electricity [ ] solar panels [ ] fuelwood
9. Ownership of a vehicle/wheelbarrow (how many?) for collecting natural resources:
10. Complete the table

| Natural resource | | Used in the last year? | | If not used, why? | Used in the past but not now? | | If yes, why not now? |
|---|---|---|---|---|---|---|---|
| | | Yes | No | | Yes | No | |
| Wood for: | firewood | | | | | | |
| | carvings | | | | | | |
| | household utensils | | | | | | |
| | fences/kraals | | | | | | |
| | Housing poles | | | | | | |
| Wild spinach: | | | | | | | |
| Grass/reeds for: | Thatching | | | | | | |
| | Hand-brushes | | | | | | |
| | mats | | | | | | |
| Palm leaves for weaving: | | | | | | | |
| Wild fruits for: | Eating | | | | | | |
| | Beer | | | | | | |
| Edible insects: | | | | | | | |
| Medicines: | Roots | | | | | | |
| | Leaves | | | | | | |
| | Bark | | | | | | |
| Bushmeat | | | | | | | |
| Other edible plants (e.g. mushrooms) | | | | | | | |
| Water lily: | | | | | | | |
| Fish: | | | | | | | |

11. Could you please rank the five most important resources that you mentioned using above. (1=most important; 5= least important).
12. Why are these resources important for you?
13. Where did you collect the resources that you have mentioned using? (List according to table above)
14. Did you buy any of the resources that you mentioned using?
15. Of the five most important resources, do you sell any of them? If yes, where do you sell them? If no, why do you not sell anything? (List according to product).
16. Do you use these resources all year round/seasonally/only in times of need? (List according to table above)
17. Of these five most important resources, have you noticed a decrease, or an increase, in their availability since you began using them?
18. Would you like to be using more or fewer natural resources?

19. If you would like to be using more, what are some of the barriers that prevent you from doing this?
20. If you would rather be using fewer resources, why would you want to use fewer?
21. Are there any government rules and regulations about the harvesting of natural resources? If yes, please could you describe them?
22. Are the government rules about using the forests a problem or a good thing? Why?
23. Do you think that you have easy access to natural resources?
24. Has tourism affected the ways in which you use the forest?
25. Of your five most important resources, are there any traditional norms or practices governing the harvesting of natural resources? If yes, can you explain them?
26. Are these traditions enforced? If yes, how/by whom?
27. Do you think there has been a decrease in the traditional practices of using natural resources over the years? If yes, why?
28. Are there any kinds of resource uses that only some people in your household know about? If yes, who are these people and why do they only know?
29. Did your grandparents/elders use natural resources in a different way to how you use them? How is it different? Why has it changed? Do you think the rapid growth of your town has affected the way in which you use the forests? If so, how?
30. Do you think the wildlife in the Chobe region affects how you use natural resources? If so, how?
31. What do you think are the major threats to the natural resources you use? (List according to table above)
32. What do you think are some of the solutions to the problems you face in using natural resources?

**Appendix 2: Key Informant Interview with the Senior Forestry Officer Questionnaire**

University of Cape Town and CARACAL

Stephanie Joos-Vandewalle Masters Project Data Collection

Changing natural resource dependencies in a rural/urban context

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1. What are the main natural resources that people are collecting around Kasane, Kazungula and Lesoma?

2. Do you have any rules and regulations guiding the harvesting or felling of wild trees? If yes, please describe them.
3. Do you have any rules and regulations guiding the harvesting of other natural resources such as

plants, edible insects, and edible fruits? If yes, please describe them.

4. What are the different rules that apply for harvesting on:
    - People's yards
    - Farms in villages
    - Communal village land
    - Conservation or protected areas
    - State land
    - Private farm land
    - Municipal land
5. Who owns forest products:
    - In people's yards
    - on people's farms
    - on communal lands
    - in forest reserves
6. Who regulates and controls the use of natural resources on communal lands?
7. Who monitors and enforces the rules and regulations for natural resources?
8. Are these rules and regulations actively enforced?
9. Do many people get caught for infractions over the use of natural resources?
10. What is the relationship between the tribal and customary legal system for regulating natural resource use and the governmental system?
11. Do you work with other institutions – e.g. conservation authorities – to monitor and enforce the rules and regulations?
12. What is working or not with the current system of natural resource rules and regulation? Are there any changes you would like to see?
13. Do you think natural resource commercialisation offers a good opportunity to improve livelihoods in the region?
14. Are people using more natural resources today than they were 20 years ago? If yes, why do you think this is so?
15. Do you think the availability of natural resources is decreasing or increasing?
16. What do you think are some of the advantages for local people to use natural resources?
17. What do you think are some of the major threats to natural resources in the Chobe region?
18. What do you think are some of the barriers to people using natural resources in the areas around Kasane, Kazungula and Lesoma?
19. Do you think the barriers faced by people living in this region are similar to the problems faced by people living in other parts of Botswana?
20. Are the opportunities to use natural resources easily available to people? (E.g. access to the

forest etc.)

21. Do you think tourism, and a potential focus on wildlife, has a negative or a positive effect on access and natural resource use?

End – thank you so much

**Appendix 3: Key Informant Interview with the Chief of Kasane Questionnaire**

University of Cape Town

Stephanie Joos-Vandewalle Masters Project Data Collection

Changing natural resource dependencies in a rural/urban context

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1. What are the most common natural resources that people are collecting in Kasane, Kazungula and Lesoma?
2. Do you have any rules and regulations guiding the harvesting of resources such as trees, plants, edible insects, edible fruits, medicines etc.?
3. Have any of these traditional rules changed over time?
4. Can anyone harvest natural resources? Can people from outside a village harvest? Do they need to ask permission of the village headman or others to do so?
5. Who owns resources:
   - in people's yards
   - on people's farms
   - on communal lands
6. How is ownership over land allocated in the villages?
7. Who regulates and controls the use of natural resources on communal lands?
8. Who monitors and enforces the rules and regulations for natural resources?
9. Are these rules and regulations actively enforced?
10. What is the relationship between the tribal and customary legal system for regulating natural resource harvesting, and the governmental system?
11. Is natural resource use jointly regulated by the Kgosi and the kgotla? Who has ultimate authority?
12. How are decisions about natural resource use made in your village?
13. Are people using more natural resources today than they were 20 years ago? If yes, why and who?
14. Do you think natural resource commercialisation offers a good opportunity to improve livelihoods in the region?

15. What is working or not with the current system of natural resource use rules and regulation? Are there any changes you would like to see?
16. What do you think are the opportunities people have for accessing natural resources?
17. What do you think are the barriers to people using natural resources?
18. Do you think there has been a loss of traditional knowledge regarding the uses of natural resources over the years?

**Appendix 4: Key Informant Interview with the Tourism Development Manager Questionnaire**

University of Cape Town

Stephanie Joos-Vandewalle Masters Project Data Collection

Changing natural resource dependencies in a rural/urban context

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1. Which natural resources do you think people are predominantly using in Kasane, Kazungula and Lesoma?
2. Has tourism always been important in this area?
3. How do you think tourism might be affecting the way in which people use natural resources?
4. Do you think the focus on tourism and wildlife conservation has an impact on local people's access to and use of natural resources?
5. Do you think the government places a higher priority on tourism or on community well-being and livelihoods in this area?
6. Does the tourism industry in Kasane, Kazungula and Lesoma employ many local people?
7. Are there any initiatives in this area that aim to combine tourism interests and local community livelihoods?
8. Do you think there is a good market for the commercialisation of natural resources, for the tourism industry, by local people?
9. What do you think are the opportunities people have for accessing natural resources?
10. What do you think are the barriers to people using natural resources?
12. Why do more people not sell natural resources to the tourists that visit this area?
13. What do you think are some of the ways in which tourism and community use of natural resources can work together to benefit one another?

**Appendix 5: Key Informant Interview with the Trust Manager of CECT Questionnaire**

University of Cape Town

Stephanie Joos-Vandewalle Masters Project Data Collection

Changing natural resource dependencies in a rural/urban context?

1. How long have CBNRM initiatives been implemented in the Chobe region?
2. Are there any initiatives that deal with natural resource use in this area?
3. Do any communities in this area have some kind of management over natural resources?
4. Are these initiatives in collaboration with local authorities, whether it is governmental or tribal?
5. What do you think are the main natural resources that people are using in Kasane, Kazungula and Lesoma?
6. What do you think are the opportunities people have for accessing natural resources?
7. What do you think are the barriers people face in using natural resources?
8. What are some of the opportunities for communities and CBNRM in this area, in relation to natural resources?
9. Do you think natural resource commercialisation offers a good opportunity to improve livelihoods in the region?
10. What is working or not with the current system of natural resource rules and regulation? Are there any changes you would like to see?
11. What are some of the shortfalls of CBNRM in this area?
12. Do you think there is scope for better CBNRM to be implemented with regards to natural resource use?
13. Are there any rules and regulations present that make it difficult for CBNRM to be implemented?