

CAUSES OF HUMAN ENCROACHMENT ON KALULU FOREST IN
KABWE DISTRICT OF CENTRAL PROVINCE,
ZAMBIA

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ZAMBIA

By

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CERTIFICATION
Masters of Disaster Studies

The undersigned hereby certify that they (he/she) have read and recommend the
Research Report to be accepted by Mulungushi University in (partial) fulfilment of the
requirements for examination at Mulungushi University.

Prof./Dr.:.....(Supervisor 1)

Date:.....

DECLARATION

I, Chama Cephas, holder of NRC 184399/49/1, do declare that this is my own work and that it shall not be in any way submitted by anyone for a similar qualification at any University or College. Although I may have conferred with others in preparing this Research Report and drawn upon a range of sources cited in it, it is exclusively my own original work, has not, and will not be presented to any other university for a similar or any other degree award.

Chama Cephas

Signed:..... This Day of

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I would like to acknowledge the following people for their great contribution to my study. Had it not been for these great people my studies would have been a night mere.

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DEDICATION

This work is dedicated to the almighty God who gave me strength and good health to carry on my research and complete it. The joy of the lord is my strength.

I wish also to dedicate to My sons, Mulenga Chama, Mushota Chama, Mapalo Chama and Michael Chama. Sons the sky is the limit, you have always inspired me to work hard. To My beautiful wife the mother of my children your encouragement made me work extra hard.

DISCLAIMER

The views expressed in this report does not repressed the views of Mulungushi University.

ABSTRACT

Forest reserves in Kabwe have undergone changes over the years due to encroachment by humans who are engaged in activities as such agriculture, charcoal production and even settlements. This has led to the deforestation of Kalulu Forest in Kabwe district of Central province. The main objective of this study was to establish causes of human encroachment of Kalulu Forest. The study was conducted through both qualitative and quantitative approaches. Primary and secondary data was collected using in-depth interviews, focused group discussions and questionnaires. The target groups included the forest squatters living in Kalulu forest as well as government forestry officials at both district and provincial levels. The study conducted was based on environmental ethical theories, which included; nature-culture theory, knowledge systems theory as well as the land sharing theory. The study reveals that socio-economic factors were some of the causes of human encroachment of Kalulu Forest. Unemployment, family ties and economic activities such as farming, charcoal production and rearing of domestic animal. Unemployment was caused by privatisation of parastatal companies, which included the mines have undermined people's livelihoods. The restructuring of the forest department that abolished the position of forest guards made "vacant" protected forest land an attractive option for the people. This left Kalulu Forest unprotected from human encroachment.

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ABBREVIATIONS AND ACRONYMS

MENR	Ministry of Environment and Natural Resources
MINDECO	Mining Development Corporation
MTENR	Ministry of Tourism, Environment and Natural Resources
NCS	National Conservation –Strategy
NGOs	Non-Governmental Organisations
NWFP	Non-Wood Forest Products
PFAP	Provincial Forestry Action Programme
PFM	Participatory Forestry Management
PRSP	Poverty Reduction Strategy Paper
PSRP	Public Sector Reform Programme
SEI	Stockholm Environmental Institute
SI	Statutory Instrument
SLA	Sustainable Livelihoods Approach
SOEs	State Owned Enterprises
TEK	Traditional Ecological Knowledge
TK	Traditional Knowledge
UDI	Unilateral Declaration of Independence (Zimbabwe 1971)
UNEP	United Nations Environmental Programme
USA	United States of America
USAID	United States of America International Development Agency
WCED	World Commission on Environment and Development
WCMC	World Conservation Monitoring Centre
WRI	World Resources Institute
WRM	World Rainforest Movement
WWF	World Wide Fund for Nature
ZCCM	Zambia Consolidated Copper Mines
ZFAP	Zambia Forestry Action Plan
ZNAP	Zambia National Action Programme for combating desertification
FD	Forest department
FRA	Food Reserve Agency

CHAPTER ONE

INTRODUCTION

1.1 Background

Zambia has a large forest cover estimated at 60% of the total land (Kalinda et al. 2013; Vinya et al. 2011), placing it among the highly forested countries in Africa. The rate of deforestation between 2005 and 2015 was at 10.0% per annum and increased to 14.3% in 2016. However, the rate that forest cover is being lost has increasingly become worrisome such that if it remains uncontrolled it may lead to complete loss of biodiversity (Mbindo 2003; Mulenga, Nkonde, and Ngoma 2015). Between 2005 and 20015 about 851,000 hectares of forest was lost (Mbindo 2003). Both Mbindo (2003) and Mulenga, Nkonde, and Ngoma (2015) find encroachment and wood fuel extraction to be the main contributing factor to the high levels of deforestation. Forest resources, in this paper refer to materials provided by a forest for direct consumption or commercial use such as tree products and forage. In addition, a forestry policy involves strategic guidance for managing and using forests and trees (FAO 2014). There are several policies providing guidelines on the extraction of forest products. One such policy is the 2010 National Forest Policy (NFP) that stresses the importance of non-timber forestry products (NTFP) for poverty reduction. To implement this policy, the Forestry Department through Parliament introduced Statutory Instrument Number 52 of 2013, the emphasis of which was on controlling the loss of biodiversity, restricted access to some NTFPs by local communities. However, the statutory instrument appeared to be contradictory to the 2010 NFP that looked at NTFP as a tool to improving the livelihoods of the local communities. As follow up to that, the Revised National Forest Policy of 2014 strongly emphasized inclusion of local communities, traditional institutions, private sector, and other stakeholders in the management and utilization of forest resources at all stages of decision making, implementation, and monitoring (Mulenga, Nkonde, and Ngoma 2015). However, there remains little understanding of the contribution of NTFPs to most rural household welfare (Mulenga et al. 2014). Considering that Zambia's heavy reliance on wood fuel is an underlying reason for deforestation, the National Energy Policy is another important policy that guides how to reduce the country's dependence on wood fuel by promoting cleaner and cheaper alternative energy sources.

Shitima (2005) defines encroachment as entering some area or property without any permission from the property owners or the concerned authorities. encroachment is also seen as an action of trespass whereby intruding or trespassing on other's property, and no matter how minor the boundary passing may be, it is treated as consequential. These activities entail a boundary crossing which Blomley (2005) calls it an encroachment. Encroachment broadly refers to entry into some area or property without permission from the property owner or authorities. Encroachment is a term used to describe the advancement of structures, roads, railroads, improved paths, utilities, and other development, into natural areas including forest reserves, floodplains, river corridors, wetlands, lakes and ponds, and the buffers around these areas. The term encroachment also encompasses the placement of fill, the removal of vegetation, or an alteration of topography into such natural areas. These encroachments cause impacts to the functions and values of those natural areas, such as a decline in water quality, loss of habitat (both aquatic and terrestrial), disruption of equilibrium (or naturally stable) conditions, loss of flood attenuation, or reduction of ecological processes.

Encroachment is an illegal activity as one where the person who encroaches is not deemed to have any legal right to do so. It can also mean to enter another person's property by gradual steps, or exceed accepted boundaries set by the authorities. In forestry, encroachment refers to the infringement or extension of other activities or land uses into the boundaries of protected forest areas (Dudik 1992). The most common forms of encroachment activities or land uses include settlements and agriculture. Nevertheless, this definition is complicated by claims of communities already settled in areas prior to their declaration as protected forest areas. The argument then is that it is the protected forest, which has 'encroached' on people's settlements. This shows how complex the issue of encroachment can be, particularly in management regimes based on exclusion of people and their activities. This research report looks at the causes of human encroachment in Kalulu forest.

Kalulu forest is 4738 hectares and it is the smallest forest in Kabwe. It is close to Kabwe town and close to Makululu Compound, which is the third biggest shanty compound in Southern Africa. Kalulu was made as a national forest reserve because of its underground water fields and its great number of indigenous trees, which protect this underground water fields. The Forest department has been given the mandate to protect this forest in accordance with the forest Act of 1973. Not until 1996 did Kalulu forest

occupied by many squatters. Although people would go into the forest to cut trees for either subsistence or commercial use. The forest Guard who lived there patrolled and protected the forest from illegal activities and ensured that all who visited the forest had obtained licenses from the forest department. Charcoal producers and timber producers had to follow the coupe system, which entails for a specific part of the forest to be utilized for a given number of years in a proper and sustainable manner under the supervision of the forest department.

This was the trend from the first republic when the forestry department had strong and vibrant policies and the government had no intentions to interfere with the running of the forest department. In 1996, the forest department was restructured and abolished the forest guide who patrolled the forest. People within and outside Kabwe took advantage of this scenario and moved into Kalulu forest. The new structure of the forest department did not take into consideration the fact that forest needed to be guided and ensure that squatters did not take advantage.

1.2 Problem Statement

In 2003, the Zambian government had observed with great concern that almost all the four hundred and seventy three (473) Forest Reserves in the entire country were encroached and people who were conducting various activities such as settlements, cultivation, charcoal burning or mining within these protected forest areas (Diggers Newspaper; 23rd January).

The encroachment of these forests reserves has resulted in serious deforestation, which has led to the loss to some tree species and subsequently biodiversity being threatened by altered ecosystem. Between 2005 and 2015 about 851,000 hectares of forest in Zambia was lost (Mbindo 2003).

Kalulu Forest in Kabwe District is one of the forest reserves in Zambia that has been encroached by humans and has resulted in depletion of the forest because of activities of the squatters. It is therefore, not clear what led to the encroachment of the forest reserve. It is against this background that this study was aimed at establishing causes of human encroachment of Kalulu Forest Reserve in Kabwe district and find ways of mitigating the problem.

1.3 Aim of the Study

The study was aimed at establishing the factors that have contributed to the human encroachment of Kalulu forest, and examine possible intervention to reduce encroachment.

1.4 Objectives

- i. To establish the social economic factors that have led to human encroachment on Kalulu forest.
- ii. To explore the main human activities involved by squatter in Kalulu forest.
- iii. To evaluate the success of the outreach programmes of the Department of Forestry to squatters of Kalulu Forest

1.5 Research Questions

- i. What are the social economic factors that have led to human encroachment in Kalulu forest?
- ii. What are the main human activities involved by squatter in Kalulu forest?
- iii. How successful have been the outreach programmes of the Department of Forestry?

1.6 Significance of the Study

The purpose of the study was to establish the underlying causes of human encroachment on Kalulu forest Reserve in Kabwe District of Central Zambia and find possible measures to reduce encroachment. The findings of this study could be of benefit to the Government especially the Department of Forestry, policy makers and the community at large in finding solutions to reduce human encroachment on forest reserves in Zambia. The research conducted is a partial fulfillment for the award of a Masters in Disaster Studies at Mulungushi University. The findings would also contribute to the already existing body of knowledge, which might be of help for future researchers.

1.7 Scope of the Study

The study was restricted to squatters in the Kalulu Forest Reserve in Kabwe district of Central Province of Zambia. It was aimed at establishing the underlying causes of human encroachment and the intervention measures taken so far to reduce encroachment in Kalulu forest.

1.8. Conceptual Frame Work

A Research Framework on the possible causes of human encroachment on the forest reserve. The encroachment, which is the dependent variable, could be influenced by several independent factors, including population growth, Unemployment, high demand for land for agriculture, high demand for wood fuel and charcoal production, weak Forest policy, land policy, cultural perception and changes in resource use pattern. As the result of encroachment, the environment is affected. The relationship between man and the environment has long been mutual and co-evolving. This research will ascertain the various factors, influencing encroachment well focusing on the most influential factors

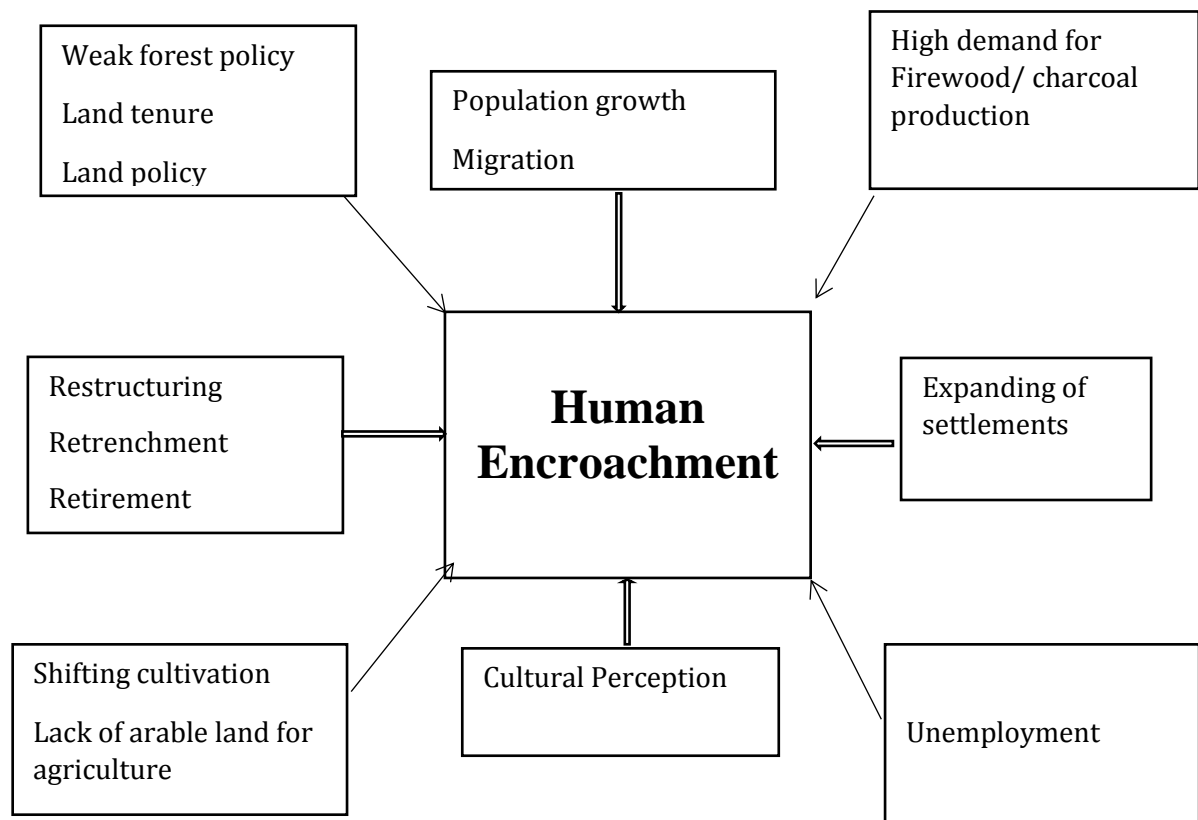


Figure 1: Conceptual Framework on possible causes of human encroachment on the forest reserve.

1.9 Theoretical Framework

The relationship between society or humans and nature has been of great interest to researchers and other scholars for a long time. The very basis of conservation is the notion that there exists part of the earth or its resources 'out there', which is untouched by humans. This 'external nature' is regarded as pristine, untouched, God-given and desirable to preserve in that natural state untainted by human influence (Castree 2001). According to this view, nature is distinct from what is human or cultural and therefore

certain 'wilderness' areas must be set aside in order to protect them from human influence. This explains the practice of excluding or at least restricting humans from protected areas. The nature-culture theory is a broad one and cannot fully be surveyed in this report. Therefore, focus is placed on those components of the debate relevant to this inquiry such as the perception that nature is separate and distinct from humanity and the contested location of man in this natural scheme of things. This is because whatever side is taken on this issue influences conservation policy and practices implemented such as excluding people and their activities from areas to be conserved. This gives rise to such concepts as encroachment, squatting and illegal settlements. Alternatively, people are left within 'nature' which is to be conserved as they are regarded as integral and legitimate components of nature and their activities are mere natural processes that have always been in tune with nature. This view implies that human activities should not be regarded as external impacts on nature but are within the natural realm of nature and therefore cannot constitute impacts on it (Aitken 2004). Most local communities intuitively take this approach in the management of their resources such as forestry and do not set any areas aside.

1.10 Knowledge-Systems Theory

The management of natural resources including forests is based on a set of values, ethics and norms, which are part of a given system of knowledge. Broadly, there are two types of systems of knowledge; indigenous knowledge which is also erroneously referred to as 'traditional' or non-modern knowledge on one hand, and western 'scientific' or 'modern' knowledge on the other. These different modes of knowing were based on different values and the power relations between them determine which meanings are adopted in resource management (Banuri and Appel-Marglin 1993, 1). The 'scientific' or western system of knowledge is the predominant knowledge system in mainstream development as well as most public institutions worldwide, particularly in natural resource management such as forestry. These broad categories of knowledge systems have different characteristics, which distinguish them from one another.

The relevance of knowledge systems theory to this study is that there are claims for superiority between these two systems of knowing. As Bavisker (2000, 115) puts it "across the Eco development divide, claims to superior knowledge are key to legitimizing claims to control over natural resources". The superior knowledge system in this case imposes its values in natural resource management. It is therefore necessary to take into account which knowledge system forms the basis for the conservation

programme under study as this provides explanation for the way such programmers were implemented and whose worldview they reflect.

1.11. Environmental ethical theories

Traditional ethical theories are mainly concerned with how human beings relate to, or ought to relate to each other while environmental ethical theories have gone beyond this to include the non-human natural environment of living and non-living beings. Environmental Ethics understands itself as more than an extension of traditional ethics but rather as a more comprehensive perspective on ethics. What follows, then, are some of the environmental ethical theories that are relevant to this research.

1.11.1. The Land Ethic

According to Aldo Leopold (1989), the Land Ethic is mainly concerned about nature and the value of the ecosystem. He is undoubtedly the main influence on those who propose “holistic” ethics. Leopold’s “Land Ethic” demands that we stop treating the land as a mere object or resource. For Leopold, however, land is not merely soil. Land is instead a fountain of energy flowing through a circuit of soils, plants and animals. While food chains conduct, the energy upwards from the soil, death and decay returns the energy back to the soil. Thus, the flow of energy relies on a complex structure of relations between living things (Wenz 2001:151). While evolution gradually changes these relations, Leopold argues that human interventions have been much more violent and destructive. In order to preserve ethical relations towards the land, Leopold claims that we must move towards an ethic granting moral standing to the land community itself, and not just to its individual members. These results in Leopold’s famous ethical injunction: “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise” (Leopold 1989).

1.11.2. Social Ecology theory

What defines *Social Ecology* as “social”, according to Book chin (1993:354), is the recognition of the often-overlooked fact that nearly all our present ecological problems arise from deep-seated social problems. As such, these present ecological problems cannot be clearly understood, much less resolved, without resolutely dealing with problems within society. *Social Ecology*, then, emphasizes that nature and social structure are essentially interlinked and that the environmental crisis has arisen because of the hierarchical organization of power and the authoritarian mentality rooted in the structures of our society. *Social Ecology* tells us that the only way human

activity can have a desirable impact on earth is by a restructuring of social relations on a more egalitarian basis.

1.11.3 Land shared theory

Land shared theory use of natural resource has often received the blame for over exploitation and mismanagement. In the land shared theory two type of group use have been identified as open access and utilization without any controls on extraction rate, situation in which resource overexploitation often occurs. Collective action is dependent upon the efforts of the resource users to establish an identity that is held collectively. By collective identity, is referred to the shared land, experiences and expectations that direct the behaviors of resource users and differentiate a group of users in other words the shared- from other similar social units (Araral 2009) As the case may be the squatters in Kalulu have a communal property which they have possessed as personal property.

land sharing strategy, less land is set aside specifically for conservation, but less intensive production techniques are used to maintain some biodiversity throughout agricultural land (Green et al. 2005). These strategies are not mutually exclusive, and many conservationists believe that a combination of reserve and off reserve strategies is needed for effective biodiversity conservation (Fischer et al. 2008; Scariot 2013). As the case may be in Kalulu forest land is shared and no land is left for conservation. This has led to deforestation of the forest in Kalulu.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter compiles significant research published on a topic by accredited scholars and researchers. It analyses the scholars work on causes of human encroachment at globe level, at continental level, at national level as well as at local level.

2.2 Causes of encroachment.

Shitima (2005) defines encroachment as entering some area or property without any permission from the property owners or the concerned authorities. Encroachment could also occur through an interstitial activity such as gardening where private landholders usually extend their gardens outside their legal boundary, which could be intentional, or not. Likewise, encroachment is also seen as an action of trespass whereby intruding or trespassing on other's property, and no matter how minor the boundary passing may be, it is treated as consequential. These activities entail a boundary crossing which Blomley (2005) calls it an encroachment. "The boundary, in particular, is said to be a remarkably succinct and efficient statement, serving as perhaps the only symbolic form that combines a statement about the direction in space and a statement about possession or exclusion" (Sack, 1986). This could occur on either private or public land but mostly on the latter land (Durand Lasserre & Royston, 2002).

Protected areas are the major policy instrument for nature conservation. The number of protected areas has tripled over the last twenty years. Around 12 % of the earth's surface is now protected, an area that exceeds that under crop production (IUCN 2003). Nevertheless, biological diversity continues to decline at alarming rates, and conservation organizations argue both for an expansion of the network of protected areas, and for a better enforcement of regulations in already established protected areas. Both strategies are likely to increase conflicts with local communities, who continue to lose income and development opportunities due to restrictions on farming and livestock keeping in protected areas. Major efforts have been made to address these conflicts by developing alternative income sources for communities living near protected areas, including eco-tourism, and by involving them in the management of protected areas. These approaches have been labelled integrated development and conservation, community-based wildlife management and collaborative management. In spite of these efforts, encroachment of protected areas for agricultural production

continues to be a major problem. Encroachment is defined as the illegal use of land inside protected areas. In a study on threats to National Parks in ten countries, encroachment by agriculture and livestock was identified to be the most important threat (IUCN 1999: 12). The driving forces of encroachment are subject to debate (Horowitz 1997). Development-oriented organizations emphasize poverty as a major reason for encroachment. Advocacy groups for indigenous people call attention to the fact that the establishment of protected areas often violates customary rights – so that protected areas constitute an encroachment of indigenous lands rather than vice versa. The question of what drives encroachment – need, greed, or customary rights - is of high importance for the design of appropriate conservation and development strategies.

As IUCN (2003) notes, many proclaimed protected areas in developing nations exist more on paper than in practices. Still, in a study on land use change in the Brazilian Amazon, Mertens et al. (2002) found that the dummy “presence of a reserve” reduced deforestation. Analyzing land use change in Central Sulawesi, Maertens (2004) found that a dummy for “location inside the national park” reduced the probability that a plot is cultivated. Simulating the removal of the legal protection to the Darién Park in Panama, Nelson et al. (2001) predict an increase in the encroachment of the Park area, even though the ability to enforce restrictions was limited by the small number of Park personnel. Deininger and Minten (2002) found a significant influence of the protection dummy and concluded that protection did reduce the threat of deforestation in Mexico, even though it failed to eliminate deforestation altogether. These findings are in line with a survey of 93 protected areas in 22 tropical countries, which found that protected areas are effective in reducing encroachment (Bruner et al., 2001). In light of this empirical evidence, it is useful to presuppose that real world actors are not self-seeking, neither are they purely altruistic. Assuming that most actors occupy some middle ground, Zusman (1993) suggested a framework that captures different degrees to which individuals are prepared to deviate from norms in response to “temptations”, i.e., to gain material advantage at the expense of violating norm. This framework is useful for analysing the encroachment decision, as it captures the trade-off between the disutility caused by violating a state regulation with the utility caused by the economic benefits derived from encroachment. Encroachment on Forest reserve is a globe issue because of various factors influencing it

The causes of encroachment on protected forests and deforestation can be divided into direct and indirect or underlying causes. A major immediate or direct cause of this landscape change is generally the conversion of forests to some other form of land use. This includes agriculture, particularly shifting cultivation, overexploitation of forest products for industrial or domestic use such as lumbering and charcoal manufacturing, settlements and overgrazing. The liberalized global trade in timber is also an important cause of deforestation, particularly in developing countries. It is fashionable for studies to focus on these direct causes of deforestation while neglecting the underlying causes. According to the World Rain Forest Movement, (WRM), this is mainly because it is easier to blame ignorant peasant farmers or poverty than to deal with multiple and often interrelated underlying causes. However, as the WRM emphasizes, it is by dealing with these underlying causes that the problems can be fully understood and hopefully, the forests saved (WRM, 2002). The underlying causes of deforestation and encroachment on protected forests often include international macro-economic strategies, deep-rooted social structures such as inequalities in land tenure, discrimination against indigenous people or the poor in general and political factors including lack of participation in decision-making processes (WRM 2002). According to the WRM, it is at this level of underlying factors that solutions to deforestation and encroachment on protected forests should be found. FAO (2001b, 14) indicates that “economic and policy factors may be more important in the deforestation process.” This is because the poor are driven to their unsustainable practices by national and international forces with interests different from theirs. 4 It is simplistic to just identify the activities that the poor are involved in as the causes of deforestation as this would be treating the symptoms and not the disease, the underlying causes.

2.2.1 Population pressure

Encroachment of forests is usually done by individuals, group of individuals and institutions (Hermosilla, 2000). The increase in population leads to land scarcities forcing those with little or no land to convert forest regions to agricultural land (Little & Horowitz, 1987). In Bangladesh, population pressure and poverty are seen as the major factor engendering people’s movement into the forests (Iftekhar & Hoque, 2005). Schweik, Adhikari and Pandit (1997) also recognised the poor economic condition of the villagers coupled with the large family size as one of the forces leading to over-utilisation of forest resources. Furthermore, the type of agriculture practised like the practice of shifting cultivation can be another cause. In Nepal, farmers require

additional land to feed their families and moreover, forest products are often required for cooking fuel, heating, animal feed and construction (Thapa & Weber, 1995). The increase in population which caused forest degradation stimulates further population growth and subsequent encroachment (Hermosilla, 2000).

2.2.2 Tenure insecurity

The other cause for forest encroachment is due to lack of tenure security and related socioeconomic standing of property owners. Tenure insecurity is also found to be closely associated especially with forest encroachment. Having secure land documents and titles are known to have a positive impact on sustainable, profitable farming which will be less destructive to the environment. In Thailand, with the hope to acquire basic land use rights and subsequent legal registration, the insecure landholders adopt the plantation of perennial crops (Wannasai & Shrestha, 2008). Furthermore, active cultivation whereby the land is fenced for a longer period in some countries is sufficient in cases of adverse possession (Anon, 1991, as cited in Blomley, 2005). It is accepted that secure land tenure provides access to credit that promote investment and determines the efficient use of the land (Ali, Dercon, & Gautam, 2007). On the contrary, lack of access to land results in expansion of agriculture into forested areas and the degradation of natural resources (Wannasai & Shrestha, 2008). This kind of strategy in using crops as a tool to getting tenure-ship has been known as a common practice in the developing countries (Neef, 2001).

In Zambia all land is owned by the state. The major land uses are Agriculture and Forestry. A significant amount of the land use is in the form of protected areas. Man-made activities include crop/livestock farming as well as mining. Agricultural activities form the major component of land use in rural Zambia as well as in the designated areas for agricultural development (ECZ, 2001).

The government owns all land in Zambia. Land tenure is divided into two categories, State Land and Customary Land. State Land is largely used for urban settlement, mining, power generation and permanent commercial farming. Land holding in state land is based on renewable leasehold titles of up to 99 years. Traditional chiefs and their Village Headmen who control land allocation administer Customary Land (MENR, 1994). They decide on land usage according to requests from local community members. The traditional leadership, however, has limited authority on trees outside Protected Forest Areas, that is, trees on customary land. Any economic

activity involving such trees requires a permit from the Forestry Department. Local people are free to use the resource for domestic purposes (PFAP, 1998). In a number of cases, chiefs have instituted traditional management systems in areas outside protected forests. The Forestry Department only recognizes such areas and further encourages sustainable management and utilization practices instituted by the locals practice, enforcement is limited only to commercial exploitation

2.2.3 Inheritance practice

Inheritance practices coupled with population growth are also among the causes leading to encroachment on forestland. A typical phenomenon in South Asia is the equal sub-division of different quality of land parcels comprising a landholding among household heirs. The pace of land fragmentation is very high because of the traditional practice of sub-dividing good and poor-quality land parcels among household heirs mainly when they separate. (Schweik et al., 1997).

2.2.4 Change in agricultural practices and technology

Further, harvesting technologies and agricultural practices are also reported as influential factors that lead to such land use changes like forest conversion. Firstly, it is due to the switch in agricultural practices from shifting cultivation to the plantation of cash crops especially in southeast Asia (Chun-Lin et al., 1999). Secondly, the emergence of modern harvesting technologies, such as mechanization has been found to have a positive influence on the rate of land use changes like deforestation in developing countries (Ascher, 1995). High demand for good quality agriculture product has led to the conversion of forests to land-use for agriculture and plantations. This stimulates the farmers to take the illegal route to increase their agricultural products in opening more land for agriculture which involves felling trees and clearing land on the slope (Zin & Ahmad, 1992). Also, easy and swift access to a market which Pragtong and Thomas (1992) identifies as an economic variable that not only results in extreme forest consumption but also increases the temptation to over-harvest (Schweik et al., 1997).

About 60 per cent of the clearing of reserve forests is for agricultural and settlement (Myers, 1994; Anon., 1991) and other reasons like roads, urbanization and Fuelwood accounting for the rest (Anon., 1994b). Reserve forests are one of the last frontiers in the search for subsistence land for the most vulnerable people worldwide (Myers, 1992). Millions of people live on the tropical forest with less than a dollar a day where a third of a billion are estimated to be foreign settlers. Deforestation is proxied by the

expansion of agricultural land. This is because agricultural land expansion is generally viewed as the main source of deforestation contributing around 60 per cent of total forest deforestation. Shifting agriculture also called slash and burn agriculture is the clearing of forested land for raising or growing the crops until the soil is exhausted of nutrients and/or the site is overtaken by weeds and then moving on to clear more forest. It has been often reported as the main agent of deforestation. Smallholder production in deforestation and the growing number of such producers notably shifting cultivators were the main cause of deforestation

2.2.5 Cultural

Even the level of homogeneity of the people within a locality, the extent to which they share a common religious, ethnic or caste background or similar economic conditions, may influence what established norms and accepted behaviours existed within a community. These characteristics can influence how humans relate to one another and play a role in determining the set of socially accepted actions a villager may take regarding forest produce use (Ascher, 1995). A study by Adjei Mensah (2014) showed that religious reasons, family ties and marriage were the most dominant cultural factors influencing the majority of the respondents to encroach into forest reserve.

2.2.6. Political

One of the identified factors leading to encroachment is due to political reasons. Especially in the case where a country has a multi-party system of governance (Acharya, 2009). The influence of local political leaders in the allocation of land in Forest Reserves is also a major factor. This creates confusion among the settlers on the official position on settlement in the protected forest as forestry officials insist that the practice is illegal while local politicians seem to hold a different view. It is also clear that the forest resource as well as land for settlement is being used as political capital in exerting influence among the forest settlers. Deceptive to the forest community to whom they make various promises on land, the locals then resort to the protected areas on state land (Sunito & Sitorus, 2007). Further, inadequate land policy by the government and political instability are the two political factors identified engendering people to live in informal settlements.

2.2.7. Institutional

Another factor causing encroachment is institutional in nature. The encroachment of state land is mostly affected by the institutional arrangement, policy and processes that are in place (Manandhar et al., 2016). There is usually indefinite roles and

responsibilities, lack of accountability and procedure in the manner in which the land is distributed, appropriated, disposed or use of state land, and a lack of information on state property (Zimmermann, 2008). All these contribute to the encroachment and construction of illegal structures on state land. Moreover, weak enforcement of the laws is another cause that contributed to the rise in such settlements (Magigi & K Majani, 2006). Similarly, Fekade (2000) reinforced that institutional factors such as inefficiency of urban authorities, poor land management practices, and inadequate urban planning schemes create forest encroachment. Furthermore, Sakala (2016) adds that the existing legal and regulatory frameworks mainly give emphasis on the planned areas and do not consider the illegal occupants. “The existing land use control and regulations are becoming parts of the problem, and not of the solution, to find more rational and equitable alternatives” (Fekade, 2000). On the other hand, the government and the local authorities do not have enough resources to provide adequate forest management and guide development especially the financial inefficiencies of the local authorities (Uzun & Cete, 2004). Further, the main essence of land administration is its land information system (Mukupu, 2011). A complete, updated and accurate information on state land is essential as inefficiencies in the management of state land can lead to informal allocation and occupation of state land. Also, the exchange of information flow between the national, provincial and municipal cadastres in many countries have not been developed yet (Tuladhar, 2004). Furthermore, “the policy ambiguity, procedural complexity and prohibitive cost involved in obtaining documents (titles) which legalise ownership of urban land force to further proceed in the ‘informal’ or ‘illegal’ way” (McAuslan, 1985, as cited in Fekade, 2000, p. 131).

CHAPTER THREE

MATERIALS AND METHODS

3.1 Introduction

This chapter provides background information to the study area. It begins by giving a detailed description of Kalulu forest with emphasis on those aspects that are relevant to the project theme. This chapter also provides detailed methodology used when selecting respondents, tools and approaches for data collection, the sample size and how it was selected and how the data was processed.

3.2 Location and description Study Area

3.2.1 Location

Kalulu Forest Reserve Number 32 is a forest reserve (class L - Area) in (Central), Zambia (Africa) with the region font code of Africa/Middle East. Its coordinates are $14^{\circ}24'0''$ S and $28^{\circ}18'0''$ E in DMS (Degrees Minutes Seconds) or -14.4 and 28.3 (in decimal degrees). Its UTM position is PE40 and its Joint Operation Graphics reference is SD35-11.



Figure 2: Map of Zambia (Source: Zambian Atlas 2010)

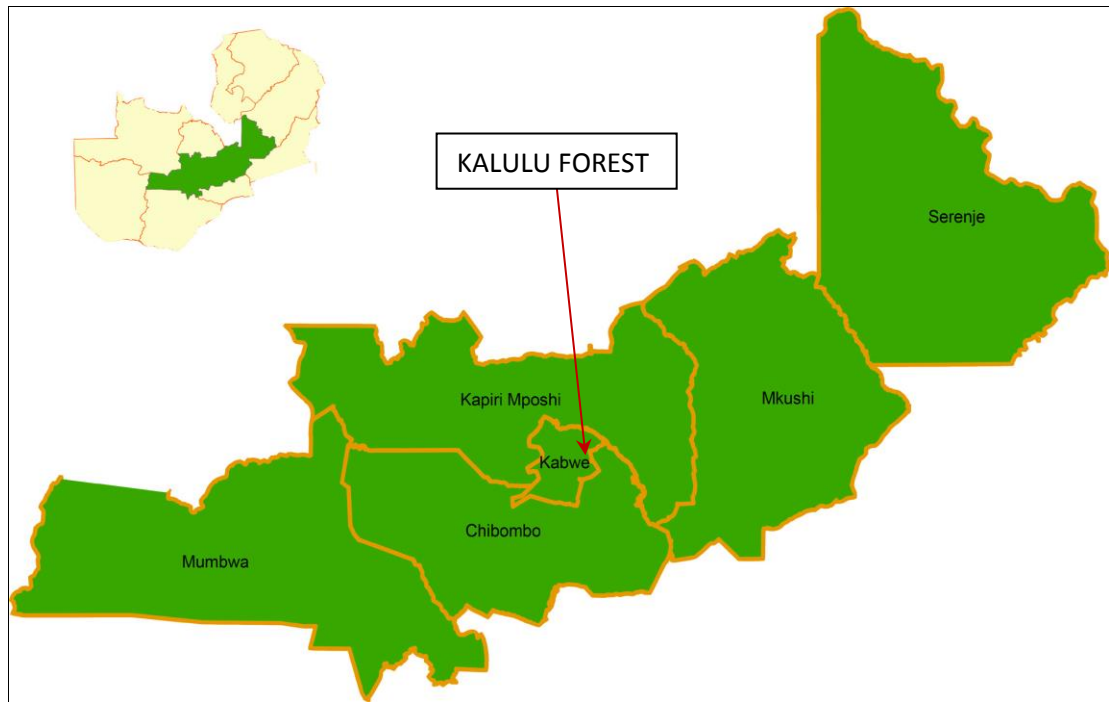


Figure: 3: Location of Kalulu forest in Kabwe District in Central Province (Source: Zambian Atlas 2010)

The study was carried out in Kabwe, Central Province of Zambia. Zambia is a landlocked country with a total land area of about 752,600 km. The country is situated on the great plateau of Central Africa, with an average altitude of 1, 200 m above sea level. The predominant vegetation type is Miombo woodland. The intensity of natural vegetation cover diminishes from the high rainfall zone (northern part of the country) to the low rainfall zone (southern part of the country). About 25 per cent of the total land area is used for agriculture, 2 per cent urban development, 39 per cent wildlife and forest development, 22 per cent is arable land, and 12 per cent is unspecified areas.

The mining industry continues to be the mainstay of Zambia's economy providing about half of the government's total revenue. Zambia's economy has had serious problems since the early 1980s. Poor management and declining world copper prices has led to a decline in the mining industry. The country is endowed with vast natural resources such as forests, which have greater potential in contributing towards national development and alleviation of poverty.

The department has six forest reserves, namely Kabwe National Forestry Block A and B (10010 Ha), Kalulu Local Forest (4738) Mulungushi West Local Forest (10785),

Munyama National Forest (17884) and Kabwe Extension known as Chibanga Forest (152 Ha). The total of these Forest Reserves is 43 569 Ha. The district has a plantation of about 20 Ha of Gmelina species. The state of the plantation is not good because of the vandalism that is taking place. The main species of the trees in the reserves as at now are the Brachystegia species (Mutondo), the Combretum species, secondly generation of Pterocarpus species (Mukwa) and the Albizia species.

Zambia's forest area consists of Forest Reserves, Game Management Areas, National Parks and Customary land. Forest reserves are gazetted areas directly under government control. Forest Management in Zambia has not been planned for a long time now. The current management plans are outdated. A national forest inventory has not been done since the 1960's. The only management tool used is the control of exploitation of timber resources through licensing. The Forestry Department uses the "coupe" system in forest reserves. The areas are demarcated prior to allocation to wood harvesters. It is in these areas that post extraction secondary forests are found. Cultivated areas left to regenerate naturally through a fallow system make up the Swidden secondary forests. The importance of these secondary forests in Zambia cannot be overemphasized. They provide a wide range of benefits such as building materials, fuel-wood and food. The forests also play an important role in watershed and soil conservation. They protect the environment thus enhancing food production.

3.2.2 Description

The study was conducted in Kabwe, s Kalulu Forest which is located about 10 Km west of Kabwe town of central province. Kabwe, s geographical coordinates are; Latitude is 14° 27' 50" South and Longitude of 28° 26' 55" East. It has an estimated population of 202, 914, (2010 Census, with a 16% share of the central province population of 1,267,803. Kabwe has about six reserve forest among them is the Kalulu local forest locate on the western of the town and near to the biggest unplanned settlement called Makulu.

Kabwe derives its name and existence from the rock of ore of Zinc and Lead. The name Kabwe is short for "Kabwe Ka Mukuba" meaning the stone of ore or the place of smelting. As result of the significance this ore was to the local people, the old motto for the town was "from the earth we derived our being". Mining started as early as 1902 in zinc and lead. The economy therefore depended on mining, due to government policies and difficulties in mining, the mine experienced closures. In the early days,

problems started as deposits containing lead and zinc could not at first be economically separated and the mine closed down. The mine reopened and the farming industry began to grow to serve the town. The railway made Kabwe its headquarters. Locomotive sheds, marshalling yards were established, and government organised its administrative headquarters for central province here. The Central African Road Services (CARS), then the largest passengers and Haulage Company in the country, set up a depot and made Kabwe its Headquarter and Kabwe became the gateway to East Africa. Declared a village in 1915, a township in 1930, Kabwe became a municipality in 1954.

3.2.3 Research Design

The research used qualitative and quantitative approaches. Qualitative data was collected by reviewing different literatures, questionnaire surveys, discussion and interviews. Quantitative data was collected from different points within the forest reserve and from records.

3.2.4 Data Collection Methods

The study involved collection of both primary and secondary data, mainly from Kalulu Forest squatters and Forestry Department officials.

The sampling procedures employed during data collection were Simple Random Sampling (SRS) and purposive sampling.

Primary data was collected by conducting in – depth interviews and focus group discussion meeting and self – administered questionnaires . In addition, secondary data was collected from Internet Journals and government reports. The respondents of the study were drawn from different villages within the forest.

3.2.4.1 In- depth interviews

In-depth interviews were on one – to – one with each respondent. All interview guides employed open-ended questions and topics allowing the respondents the flexibility to express their own views adequately. It also contained closed questions.

This was mostly applied to Kalulu squatters respondents and in total six (6) headmen were interviewed. This number of respondents among principal respondents was adequate as qualitative research does not aim at coverage but depth and so the interviews were intensive. Mostly the interviews were conducted at the homes of respondents but a number were also done at their work sites within the forest reserve.

In some cases, more than one visit was done to the respondents for further discussions and clarifications.

3.2.4.2 Focus Group Discussions

The aim of this discussion was to get the facts from the squatters on why the encroached the Kalulu Forest and the main economic activities. Three villages were sampled out of six in which focus group discussions were held within the forest. A total of seventy – four (74) respondents were interviewed.

3.2.4.3 Self-administered questionnaires

The questionnaire was used to collect data from ten (10) Forestry Department officials and ten (10) squatters of Kalulu forest.

The total number of respondents interviewed for the whole study was were hundred (100).

3.2 .5 Data Processing and Analysis

The data collected using questionnaires was subjected to verification for consistency, standard editing, uniformity and accuracy before it could be recorded. Data processing was done with simple and cross tabulations, which was analyzed by using statistical methods and excel. The raw data collected through interviews was examined to detect errors and omissions and corrections were made where possible. After that, the data was coded and syllables were assigned to put the responses into categories or classes. The data with the common characteristics were placed in one class and in this way; the entire data were divided into a number of groups. After the data had been properly arranged and coded, it was entered into SPSS for analysis and excel for formation of bar charts.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter outlines the research findings based on the data collected and analyzed. The analysis was done in tandem with the research objectives, under the topic; “Causes of human encroachment in Kalulu Forest Reserve in Kabwe district”.

4.2 Demographic Profile

The researcher included the following background items in the questionnaire and interview guides for Forestry staff and Kalulu forest squatters respectively; squatters; gender, age, marital status and number of members per household, and number of years working in the Forestry Department for the staff.

4.2.1 Gender of respondents

Figure 4 below shows that 78% of the squatters interviewed were males, while 22 % were females. The results imply that males were available and willing to take part in the study unlike their female counterparts. In addition, males were likely to provide accurate and reliable information to the researcher in terms of years.

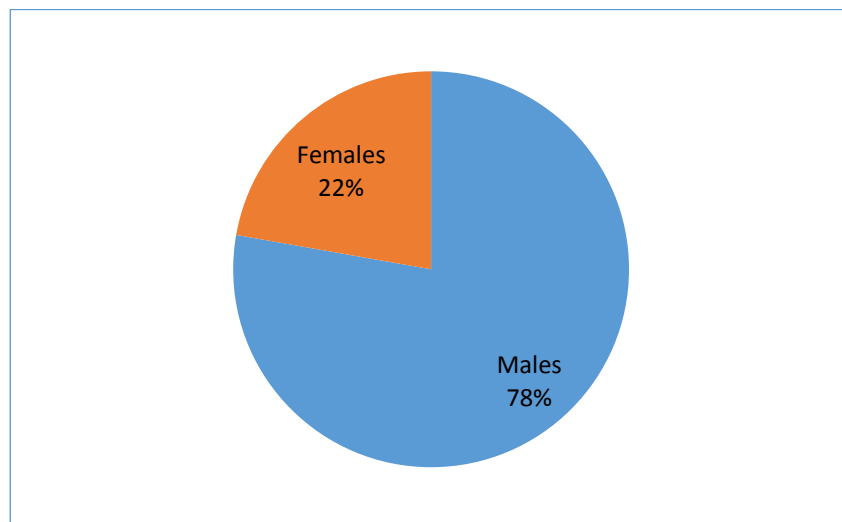


Figure: 4: Distribution of respondents by gender

4.2.2 Age of respondents

Figure 5, below shows that the majority of the respondents were falling within the age bracket of 46 – 55 years representing 44%, followed by those within 26 - 35 years

(28%), 36 – 45 years (17%) and lastly those aged more than 56 years representing 11%.

The results about the age brackets, suggest 46 – 55 years most of the men in Kalulu forest are supposed to be in the formal employment. Because this age group is the most productive and supposed to be driving the economy of the country and involved in entrepreneurship at a large scale.

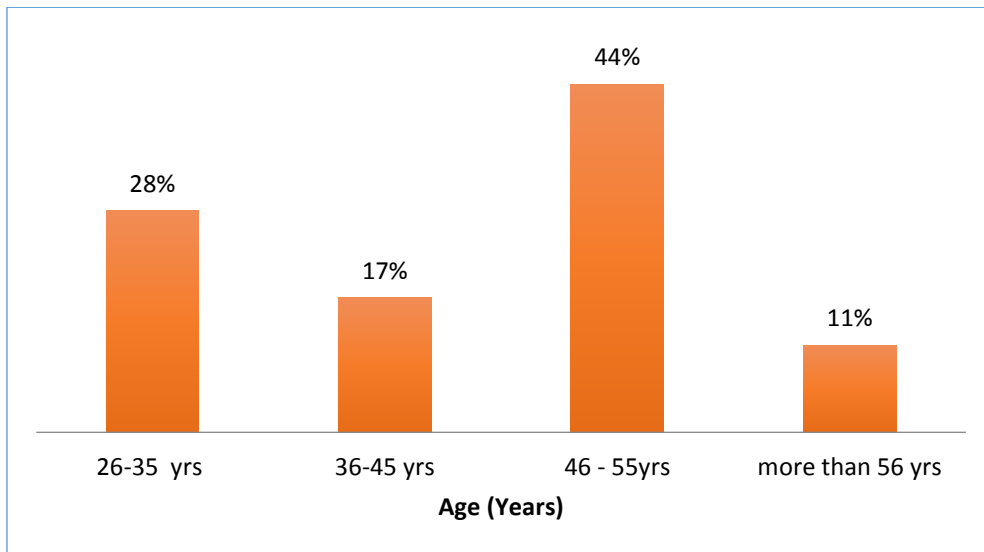


Figure 5: Distribution of respondents by Age

4.2.3 Marital Status

The results show that the majority of the respondents were married represented by 45%, and those who were widows at 33%. It also shows that widowers were represented by 7% and lastly those who were single at 5% (Fig. 6) below.

These results imply that most of the squatters are married and as such the population is growing at a fast rate and putting more pressure on the forests in terms of increased settlements and some economic activities which are likely to increase deforestation in the forest. From the results, it can be observed that most of the females are widowed. this can be attributed to the hard economic situations, especially for those men who lost their formal employment such as the miners from the Kabwe mine.

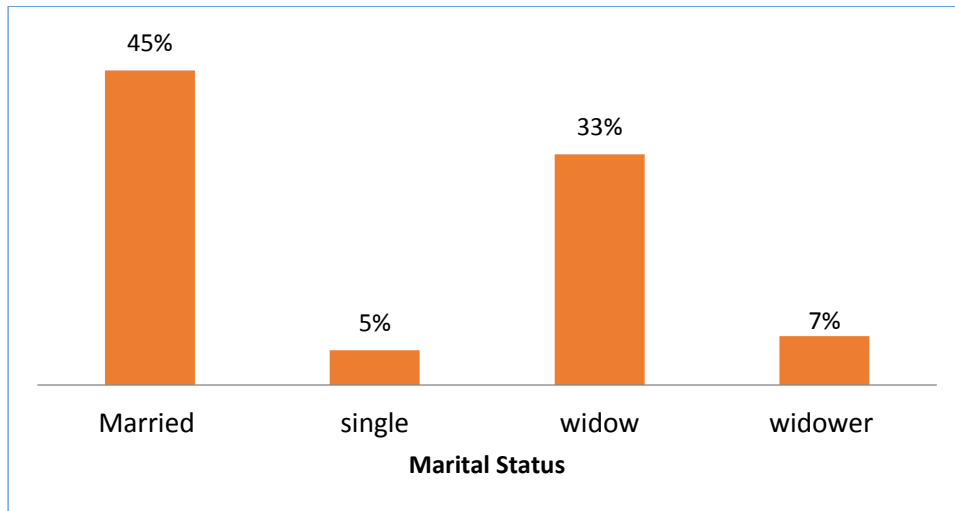


Figure 6: Distribution of respondents by marital status

4.2.4 Members per Household

The squatters were asked the number of members per their household. Results in Figure 6 below, show that 39% of respondents indicated that they had 6 – 8 members, while 33% represented those with more than 9 members per their households. The results also show that those 0 – 2 and 3 – 7 members were represented by 6% and 22% respectively.

it can be observed from the results that on average, the number of members per household in Kalulu forest is 6 – 8. This maybe attributed because of too many orphans as there are a lot of widows as shown by results in Figure 7 and family ties as relatives come from other areas to join them.

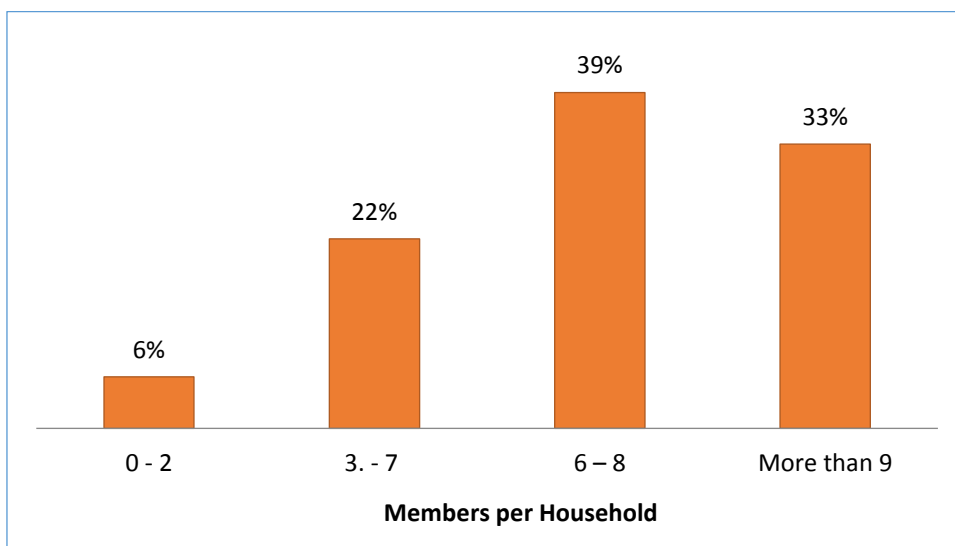


Figure 7: Distribution of respondents by members of household

4.3 Socio – Economic Factors

4.3.1 Findings on Forest Squatters

Respondents were asked questions on human encroachment of Kalulu Forest. The results are tabulated below.

4.3.1.1 Whether respondents knew that Kalulu Forest was a protected forest

When asked on whether Kalulu Forest was a protected forest, the majority of the respondents represented by 78% agreed and only 22% of them indicated that they had no knowledge of Kalulu Forest as being a protected forest(Figure 8)below.

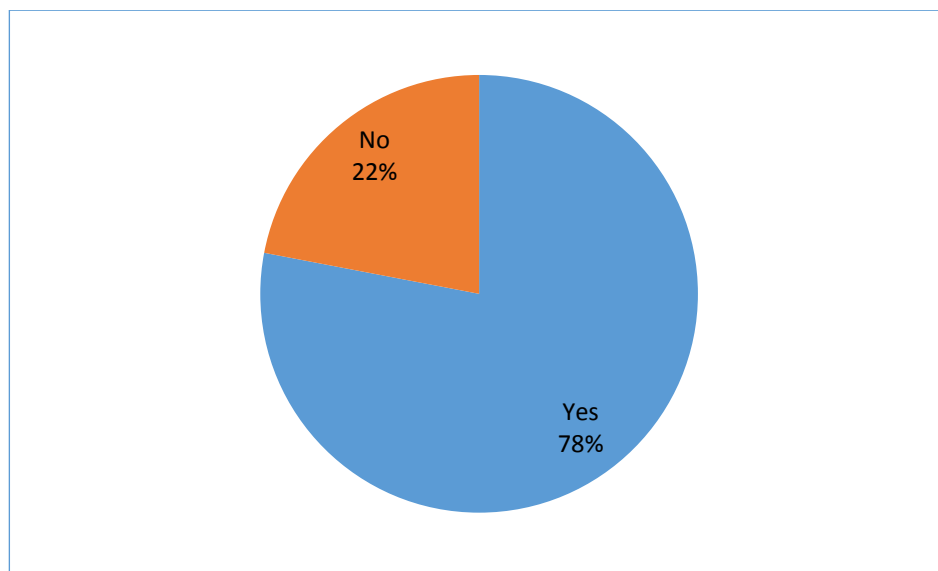


Figure 8: Knowledge on Kalulu Forest as being a protected area

4.3.1.2 Duration of squatters living in Kalulu Forest

The results in Figure 9 below show that the majority of the respondents had lived in the encroached the forest for over 15 years representing 45%, followed by those who have lived there for 11 – 15years represented by 20%. It also shows that 15% and 10% was the percentages of those who have lived for 2 – 5 years and 6-10years, less than 2 years respectively.

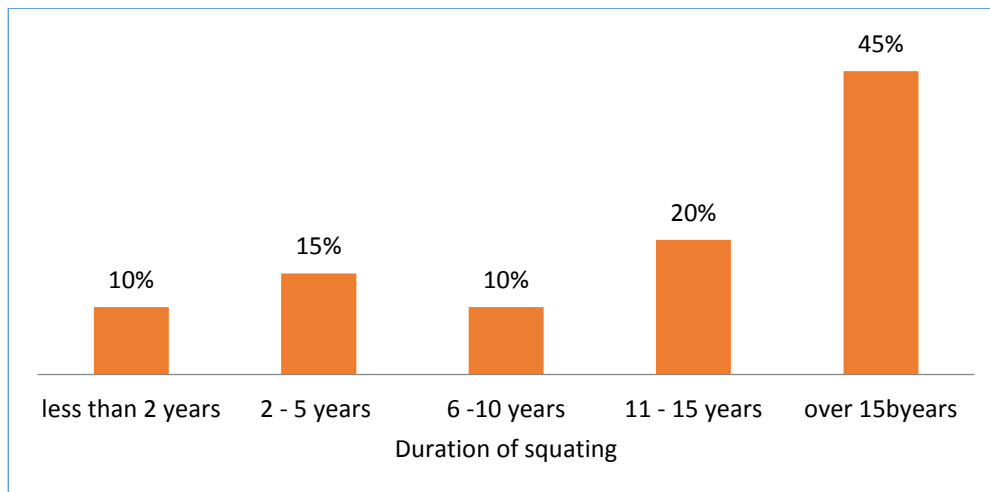


Figure 9: Duration of stay in the forest

4.3.1.3 Origin of the Kalulu forest squatters

The respondents were asked where they lived (Province) before encroaching in Kalulu forest. The results are tabulated in Table 1 below and show that the majority represented by 23% originated from within Central Province, 22% from the Copperbelt Province and the least percentage of 4% representation of respondents were from Western and Muchinga Provinces.

Table 1: Origin of squatters in Kalulu forest by Province

S/N	Provinces	Frequency	Percentage (%)
1	Central Province	21	23
2	Northern Province	6	7
3	Copperbelt Province	20	22
4	Muchinga Province	10	4
5	Lusaka Province	9	10
6	Southern Province	10	11
7	Western Province	4	4
8	Luapula Province	5	6
9	North – Western	6	7
10	Eastern Province	5	6
Total		90	100

4.3.1.4 Main reason for relocating to Kalulu Forest

When asked the reason why they relocated, results in Figure 10 show that economic freedom had the highest percentage of 55%, Access to land at 25%, poverty at 15% and the least at 5% was family ties.

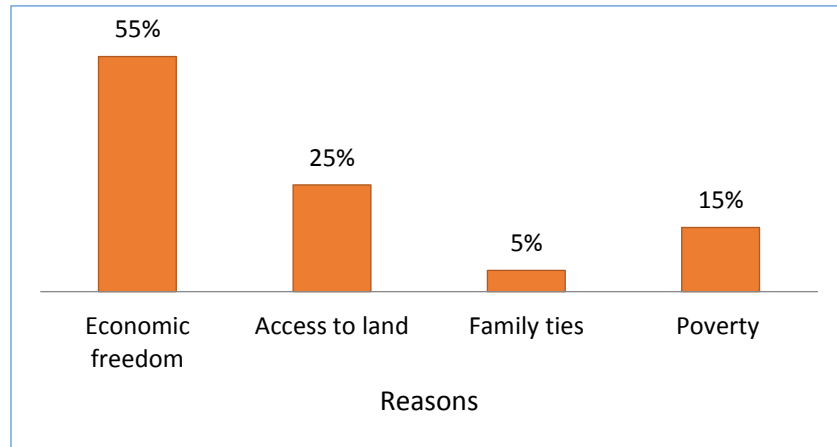


Figure 10: Reason for relocating

4.3.1.5 Reasons for leaving formal employment by squatters

When asked why they left formal employment, the in figure 11 below show that retrenched accounted for 62%, none renewal of contracts represented by 23%, those who were fired at 11% and those who were retired had the lowest percentage of 4%.

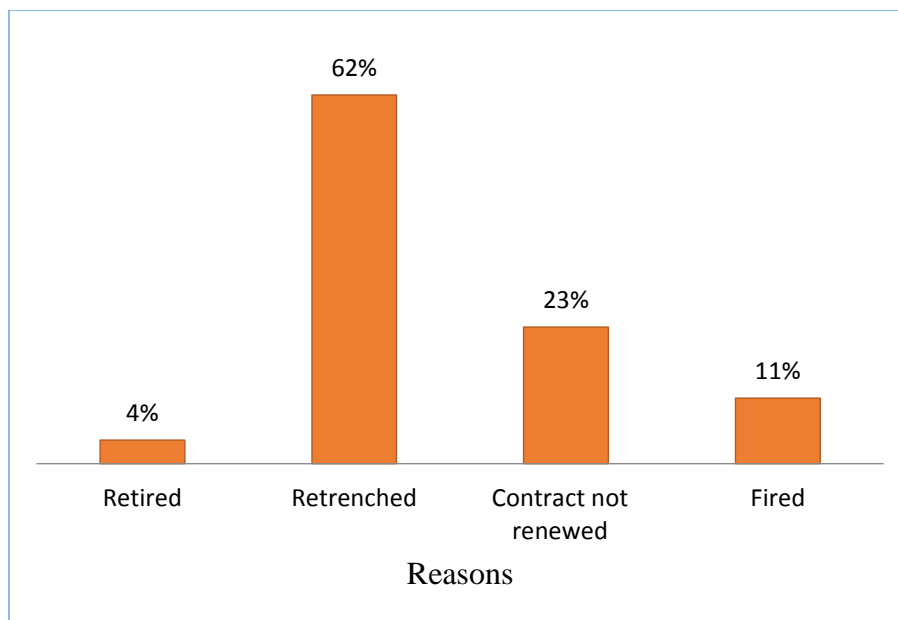


Figure 11: Reasons for leaving formal employment

4.3.1.6. Main effects of human encroachment of the forest

When asked what the main effect of human encroachment of the Kalulu Forest was all the respondents indicated that it was deforestation which resulted from clearing of land by cutting trees for farming, lumbering and charcoal production.

4.4 Main economic activities

4.4.1 Main economic activities of Kalulu forest squatters

The squatters were asked which were their main economic activities, the results in Figure 12, show that charcoal production had highest percentage of 36% and farming at 35%. The figure also show that gardening was at 20% and lumbering accounted for 9%.

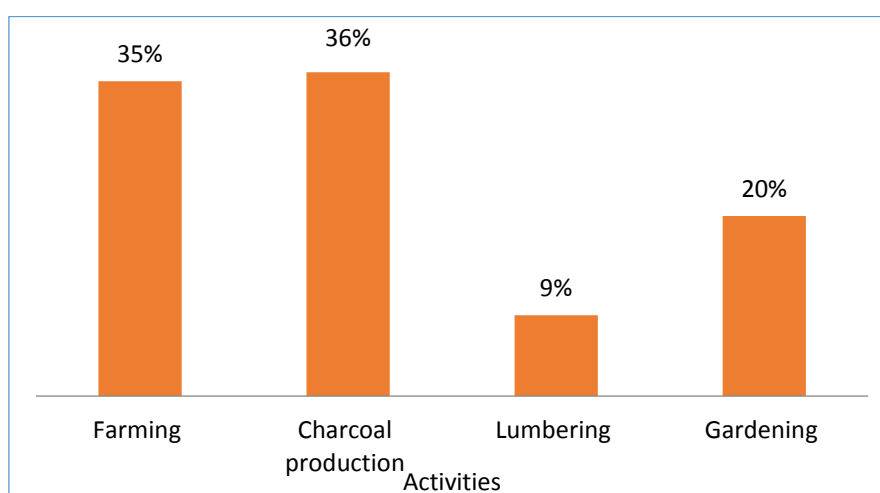


Figure 12: Main economic activities of squatters

4.4.2 Main Source of income for the squatters

Table 2 below shows results of the main sources of income for the squatters in Kalulu Forest. The results show that charcoal production has a highest percentage of 44%, followed by agricultural products represented by 33%. The table also shows that lumbering and formal employment is represented by 10% each.

Table 2: Main sources of income

source of income	Frequency	Percentage (%)
Agricultural Products	30	33
Charcoal Production	40	44
Lumbering	10	11.5
Formal employment	10	11.5
Total	90	100

4.4.3 Main customers for squatters' products

When asked about who were their main customers for their products, the results in Figure 13 show that residents of Kabwe had a percentage of 50%, followed by FRA at 35% and other customers accounted for the least percentage of 15%.

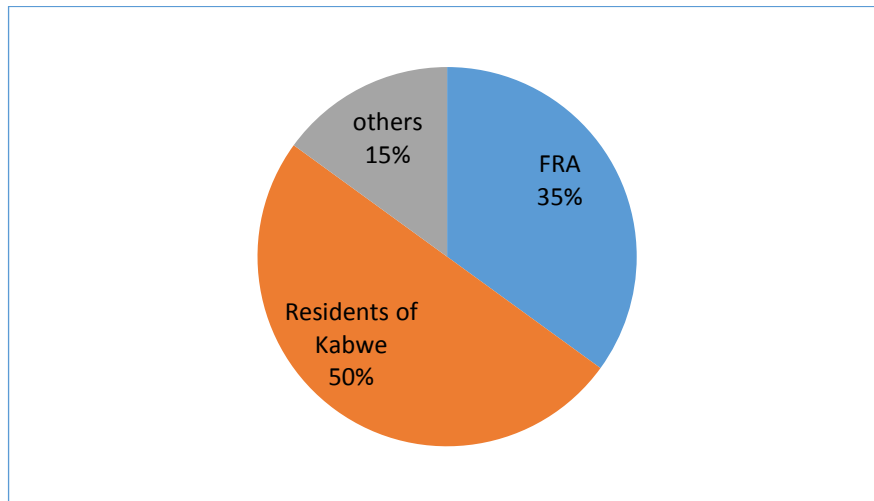


Figure 13: Main customers for the squatters

4.5 Department of Forestry Outreach Programmes

The Department of Forestry in Kabwe District has come up with outreach programmes which are aimed at mitigating the problem of encroachment of forests by humans in the district (District Forest Officer). The researcher assessed the effectiveness of these programmes.

4.5.1 Outreach information to the squatters

The results were that during the outreach programmes the following information is decimated to the squatters in the Kalulu Forest; importance of forest, dangers of cutting trees which leads to deforestation and effects of forest encroachment by humans.

4.5.2 Main outreach methods used

The researcher asked the respondents outreach methods used, the results in Figure 14, below show that Focus Group discussions had the highest percentage of 45%, followed by Mobile P.A system at 30% and the with the least percentage of 25% is Radio.

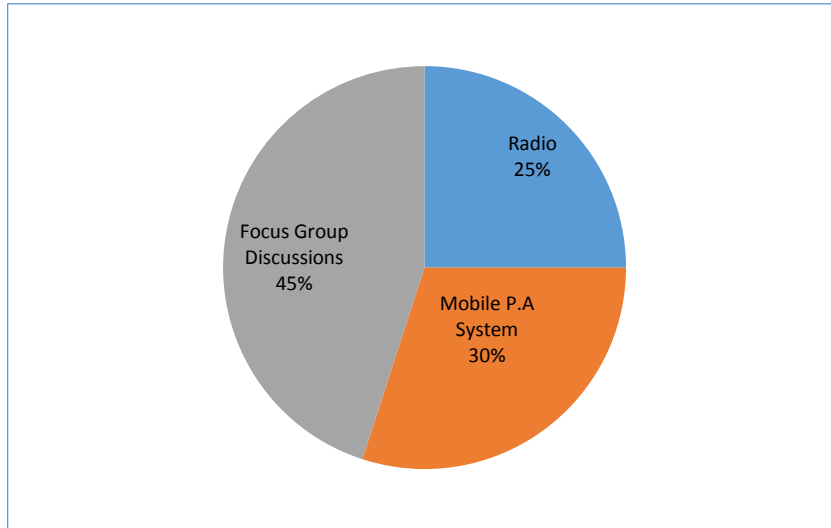


Figure 14: Main methods used in the outreach by the Forest Department

4.5.3 Frequency of reaching out

When asked how often the outreach programs were carried out, the majority represented by 83% indicated once a month and 17% stated that they are carried out once a week (Figure 15).

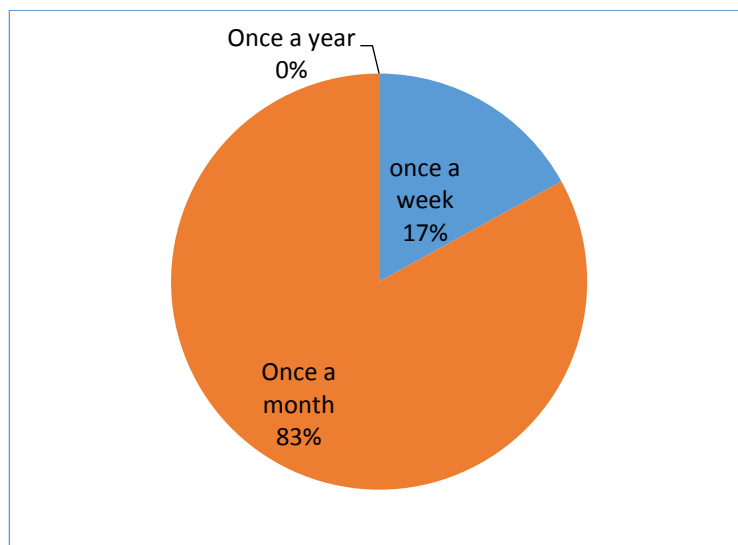


Figure 15: Frequency of reaching out to the Kalulu Squatters by FD staff

4.6 Forest Department Outreach Programme

4.6.1 Whether the outreach program has been effective

When respondents were asked on whether the FD outreach program has been effective, the majority of the them represented by 75% , their response was No and only 25% indicated Yes . The results are shown in Figure 16 below.

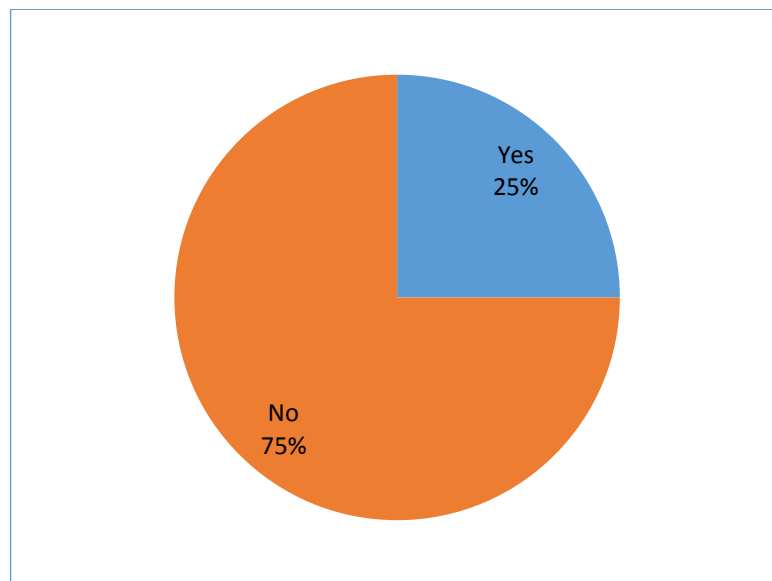


Figure 16: Distribution of respondents by their opinion on whether the FD outreach has been effective

4.6.2 Major constraints in the implementation of the outreach program

The results in Figure 16 below show that Lack of resources has the highest percentage of 40%, followed by lack of extra manpower at 35%. The figure also show that squatters no cooperative during meetings and political interference were at 20% and 5% respectively.

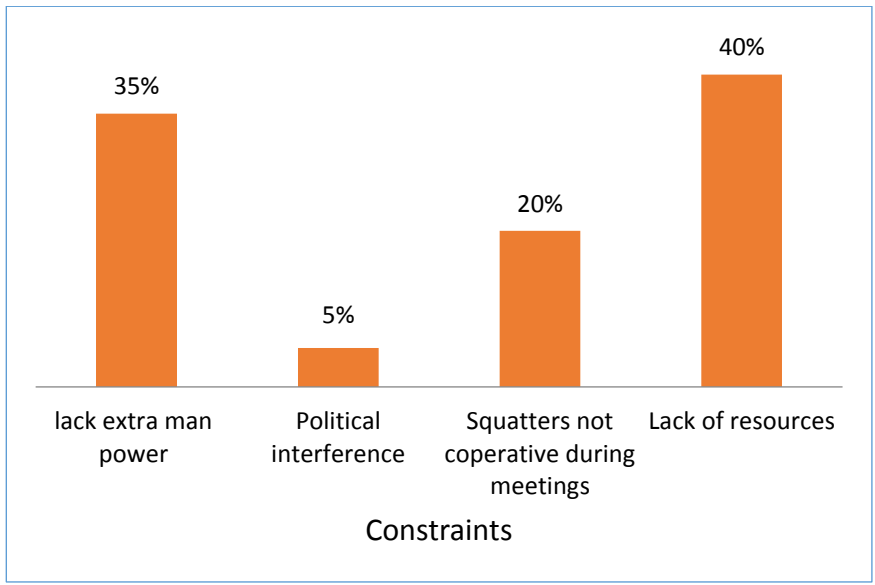


Figure 17: Constraints in the implementation of FD outreach programmes

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents discussion of the findings of the study in relation to the objectives as outlined in chapter one. It also makes presentation of the conclusion of the study together with the recommendations that involved the causes of human encroachment of Kalulu Forest in Kabwe District.

5.2 Discussion of Research Findings

5.2.1 Social factors

5.2.1.1 Kalulu Forest as protected forest

When the squatters were asked whether they were aware that Kalulu was a protected forest, the results in figure 8 show that most of them were aware that Kalulu forest was a protected forest. This implies that whatever decision they made to settle in the forest, they knew that they were illegal settlers and very much aware of the consequences such as being evicted from the forest by government.

5.2.1.2 Duration of squatters living in Kalulu Forest

The majority of the squatters have lived in Kalulu Forest for more than 15 years, results shown in Figure 9. These results imply that squatters occupied Kalulu forest during the period between 1995 and 1996. By 1996, the forest had only few squatters but currently there are about six villages that have been established within the forest and their about over 5000 people living in the forest, (CSO, 2010). The researcher noted that the large number of squatters occupied the forest after 1996; as representing by 45% of the respondents. While others also took advantage of the weak forest, policy, which abolished the Forest guards and occupied the forest. The researcher recalls that this period from 1995, that the MMD regime started the privatization of most of the Parastatal companies which included many companies in Kabwe.

5.2.1.3 Origin of the encroachers of Kalulu forest

The researcher established that people who have settled in Kalulu came from all the 10 Provinces of Zambia (Table 1). Central Province being the nearest, contributed a large number of settlers, followed by the Copperbelt Province. Some of the people who have encroached were the victims of retrenchments of major industries from Kabwe and the Copperbelt Province. These are the mining townships in the nearest

city of Kabwe with its surrounding townships or unplanned settlements and the nearby rural farming areas of Makululu Compound.

Most of them lost their jobs starting from 1994 when the government sold the mines to foreign private operators like Mopane Copper Mines in Kitwe under the privatization process and the closer of Kabwe mine, which was cited to be none profitable. While Zambia Railways was sold to private owner until in the recent past when PF government came into power and reposed the company. Mopane on the copperbelt was under a private mining company that took over the former Nkana Division of the government-mining conglomerate, the Zambia Consolidated Copper Mines (ZCCM) (ECZ 2001, 78).

For example, in Kabwe, these were Mulungushi Textile, Kabwe National Milling and others. This category of settlers with prior occupational background consisted mostly of people in their middle and advanced ages around forty years and above. They are people who had been economically displaced and were in search of alternative livelihoods.

Some of these squatters lost their jobs abruptly with no time to plan where to go and settle. For others, the prolonged waiting for their benefits worsened forced them to settle in Kalulu forest. Those who received their retirement benefits considered it inadequate especially as part of the money was deducted to pay for the purchase of houses, in Railways and mine areas that they had occupied as sitting tenants. This was under a government housing scheme intended to empower sitting tenants with houses in Zambia. These people found themselves with houses in the urban areas, no formal employment and inadequate retirement packages. At first, such people tried to live in their houses relying on their retirement package. However, after finishing their monies they had nowhere to go apart from occupying the forest without permission, and found it necessary to engage in agricultural production and started cultivating fields around the forest reserve and keeping animals. Later they moved into the forest during the farming season until they found it necessary to shift to Kalulu forest. Currently there are six villages formed within Kalulu forest.

Others mentioned having migrated from other provinces of the country to come and settle in the area.

5.2.1.4 Main reason for relocating to Kalulu Forest

As established earlier that most of the squatters originated mainly from the provinces where they were victims of restructured companies, results in figure 10 shows that most of them relocated to Kalulu Forest because they wanted economic freedom through the utilization of the forest resources such as trees and Land. Coming from a background of earning a monthly salary but turned into beggars, they needed economic freedom, hence relocating into Kalulu forest. Most of the respondents lamented that they were forced to move into Kalulu forest because of loss of employment and they need an alternative means of earning a livelihood.

Some of the squatters came to Kalulu to have access to land for agriculture as well as settlement. The first squatters to settle in Kalulu forest have now been given titles as Village headmen. Villages have been established in the Kalulu Forest, namely Chitanda, Kapande, Misamba, Chipwaya, Sangano and Musonda. These villages are named after the first person who settled in the area.

Some of them relocated because of family ties. They were encouraged by their relatives who had earlier settled in Kalulu forest and enjoyed the benefits of the forest. The land was fertile and plenty of wood fuel around them. Some squatters simply came as visitors to see their relatives, asked for land and they were given and decided to relocate to Kalulu forest.

5.2.1.5 Reasons for leaving formal employment by squatters

Most of the squatters of Kalulu Forest had loss their employment mostly because of retrenchment (Figure 11). As earlier pointed out, most squatters were victims of retrenchments after the companies either restructured or privatized that from the major parastatal companies such National Milling, Zambia Railways Limited, Kabwe mine etc. Some people who were working on contract had loss employment because their contracts were not renewed; this had put them in a desperate financial situation because they could not meet their needs such as children school fees, paying of utility bills.

Being a Kabwe resident, the researcher recalls that most of those who were retrenched from the mines had benefitted from the sale of houses as sitting tenants, but they failed to continue staying in the houses because of no steady income. They therefore decided to either put the houses on rent or sold them and found land in Kalulu for settlement.

5.2.2 Main economic activities

5.2.2.1 Main economic activities of Kalulu forest squatters

When asked what their main economic activities were, results from Figure 12, show that on average squatters were mainly involved in burning and selling charcoal which account for 36% of the respondents. This implies that most of the squatters spend more time cutting down trees as raw materials for their business. This has put so much pressure on the forest. But the importance of Kalulu forest cannot be overemphasized because it provides a wide range of benefits such as building materials, fuel wood, food and above all the forest plays an important role in protecting the underground water and soil conservation.

The charcoal that they produce is mainly sold to the residents of Kabwe as their main customers although they have customers from Lusaka who buy at a large scale (Figure 13). This state of affairs was likely to encourage them to continue their stay in the Kalulu Forest and continue causing damage to the forestry. This was also likely to attract more squatters into the forest. According to CSO,(2010) the population of Kalulu squatters has increased from 97 squatters in 1997, but the number has increased to more than five thousand squatters now.

The other human economic activity that they were involved was farming. They indicated that they clear the forest for farming and they cultivate crops such as maize at a large scale, soybeans, ground nuts, sweet potatoes. The maize they grow is sold to the FRA as their main customer (Figure 12). Despite, a squatter of Kalulu Forest, FRA has still set up a satellite depot to buy maize from. This situation is likely to encourage more squatting in the forest. But there are many informal tenures emerging out of these settlements. Despite holding no title or legal rights to the land, several transactions such as buying and selling, renting, execution of agreements take place (Dovey & King, 1978).

The results also show that lumbering and gardening is not undertaken by most encroachers of the forest. Schweik, Adhikari and Pandit (1997) also recognised the poor economic condition of the villagers coupled with the large family size as one of the forces leading to over-utilisation of forest resources. Furthermore, the type of agriculture practised like the practice of shifting cultivation can be another cause. In Nepal, farmers require additional land to feed their families and moreover, forest

products are often required for cooking fuel, heating, animal feed and construction (Thapa & Weber, 1995).

It can therefore be noted that these economic activities have contribute to the human encroachment of Kalulu forest.

5.2.2.2 Main Source of income for the squatters

The main source of income for the squatters of Kalulu Forest is the production of charcoal (Table 2). These results are in line with (Figure 12) about the main economic activities of the Squatters being charcoal production as the main activity. On average the squatters of Kalulu forest make their income from the selling charcoal which they produce. This was a famous source of income because it gives them income on almost daily basis.

The other source of income for the squatters is agricultural activities, in which growing subsistence crops such as maize, cassava, sweet potatoes, and assorted vegetables.

The other income-generating venture that was revealed during interviews and discussions was selling of animals such as cattle and goats. Currently there are cattle and more than two thousands cattle being kept in the forest. Other activities included bee keeping. This was on a very small scale and only a few people seem to be engaged in them.

These main sources of income have attracted many squatters as they find fulfilment, as they are able to have income that can at least meet their needs.

Just a few squatters are involved in lumbering and are in formal employment. These are employed in the MOH and MOGE to work on Katuntulu Health Post and Katuntulu Primary School within the Kalulu Forest.

The squatters have formed the dispersed settlement; this is the type of settlement where individual villages lie isolated or apart from one another. The researcher noted that people have been attracted to create such settlements because of fertile soil for farming in order to produce crops. Other factors are availability of water for domestic uses.

5.2.3 Forestry Department Outreach Programmes

The researcher also assessed the outreach programmes, which had been put in place to address the issues of human encroachment of forest reserve in the district.

5.2.3.1 Outreach programmes

The FD programmes contents for the squatters of Kalulu Forest were about importance conserving of forest, dangers of cutting trees which leads to deforestation and effects of forest encroachment by humans.

The FD officials indicated that on average they undertake these programs once a month (Figure 15). This is determined by the availability of resources such as fuel, money for officers' allowances and human resources to carry out these programs and to reach out the people of Kalulu forest.

5.2.3.2 Outreach methods

The most used outreach method mostly used by FD the Focus Group Discussions meetings (Figure 14). This method was preferred because there was one – to - one discussion on issues in connection to issues of encroachment and many squatters were reached in a single meeting. The FD has divided the settlement into three Zones, A, B and C. Each zone is composed of two villages and focus group discussion meetings were held per zone.

The FD also uses the Mobile P. A System outreach method, by using the vehicle and disseminating the information as the vehicle is slowly moving within the settlement. But this method has negatives such as wastage of fuel and that it was difficult to account of number of people reached out on a particular day.

5.2.3.3 Successfulness of the programmes

Both the squatters and FD officers their assessment was that the programmes have not been successful due to address issues of human encroachment of Kalulu Forest (Figure 16).

There were a number of constraints that made the programmes not to successful (Figure 17). These were lack of resources such as fuel, motor vehicles and allowances. The other set back was lack of extra manpower and squatters were not available for the meetings most of the times or they were not cooperative. These challenges made it difficult for the FD to successfully implement these programmes. This mistrust and tension has reduced chances of cooperation between the local forest community and Forest Department officials. One study conducted in Oregon, USA explored opportunities and challenges for cooperative fire management among public and private forest managers in the John Day Valley and identified five themes as variables

that may affect cooperation between the two parties: these were land tenure, power, ideology, uncertainty and trust (Bergmann and Bliss 2004)

The conflicts and the apathetic attitude of the Forest Department were also responsible for the antagonism of the people (Munkherjee and Borad 2004). These conflicts between the community and the forest authorities can be explained in terms of the different worldviews that the two parties operate under.

Interference by the local politicians in Kalulu Forest, especially in terms of land location to the new squatters within the forest was illegal. Forestry Department staff explained that when a person arrives in the forest, the Ward Chairman allocate the person land for settlement and cultivation. It was pointed out that by the Forestry officials that what the politicians were doing was illegal and against the Forest Act and constituted political interference. As so doing these politicians were encouraging encroachment in the forest.

5.3 Suggested solutions

The innovative and creative policies recommended by Rodriguez must include facilitating for alternative sources of livelihood, particularly in the Zambian context.

The people discharged from formal employment after the structural adjustment and privatisation need to be absorbed into some meaningful livelihood activities if sustainable forest conservation is to be achieved.

These studies emphasise the importance of providing alternative sources of livelihood to people in order to relieve pressure on natural resources like forests. They are in line with the views of the forest community respondents in the study area who acknowledged the environmental implications of their activities but lamented that they lacked alternatives (Allison and Badjeck 2004). In the absence of alternative livelihoods, these people have no choice but to rely on their natural capital as a source.

5.4 Conclusion

Forests are very important to national development and human welfare. It provides a variety of benefits, which include food, fuel wood, building materials and medicines. But human activities in the forests have brought deforestation and degradation, which has resulted in soil erosion, fertility loss watershed degradation and loss of biodiversity. This is because humans have encroached on the forests.

Encroachment of forests especially the reserved forests such as Kalulu in Kabwe District has been attributed to a number of factors. This section of this chapter highlights some factors from the study that caused the human encroachment of this forest reserve.

The study revealed that the socio – economic causes of human encroachment in Kalulu Forest reserve were as the results of retrenchments from the restructuring and privatization of some parastatal companies such as the in Kabwe such as Zambia Railways, Mulungushi Textiles, National Milling, United Bus of Zambia (UBZ), Kabwe Milling including Kabwe Zambia Railways, Kabwe Mines. The economic situation in Kabwe had been difficult since the country embarked on economic reforms collectively referred to as liberalization, including privatization of State Owned Enterprises (SOEs). In particular, the privatization of the mining conglomerate, the Zambia Consolidated Copper Mines (ZCCM) resulted in massive job losses (Craig 2001). And on the Copperbelt such Dunlop, Mpelembe Drilling Company, ZCCM Nkana, Mufulira Divisions were also affected by these economic reforms, and this is where most of the squatters of Kalulu forest originated from. For example, in 1994 alone, over 7,600 persons lost their jobs, mostly on the Copperbelt, and Kabwe were the town became known as the Ghost town because of its poor economic situation. (CSO 2000). This resulted in high poverty levels standing around 72.9 percent by 1998 (GRZ 2002). Most of people at that time were laid off without giving them packages. Since they had now no monthly income to meet their needs, they decided to find land so that they have economic freedom. Most of the victims of retrenchment were not mainly qualified in the jobs that they doing in these companies but just used experience and when these companies were privatized the new owners could not return them. So there was high unemployment rate especially in Central and Copperbelt Provinces. This meant that they needed to look for alternative ways of economic sustainability. This desperate situation forced them move and encroach the Kalulu Forest.

The study also revealed that since Kalulu forest had virgin land for agriculture, the early encroachers cleared land by cutting trees. The cut trees were used for charcoal production and the cleared land were for farming. These activities were very beneficial economically to the squatters. This made more and more squatters continue flocking into Kalulu forest to benefit from these activities and thereby encroaching and the cutting of trees for these economic activities continued. They were also involved in cattle and goats rearing because the forest had pretty of pastures. These are economic

activities that the squatters in Kalulu forest are involved in to date and are putting so much pressure on the forest leading to deforestation and loss of biodiversity. Forest apart from being a source of a variety of products such as timber, wild fruits, and food influence local and regional climates as well as preserve soil cover and in the case of watershed, protect soil downstream from floods. Increased runoff of rainwater owing to deforestation helps strip soil away, depriving agriculture of nutrients and clogging water reservoirs and irrigation systems.

The findings of the study revealed that when the position of Forestry Guards was abolished in the Forestry Department, people who were desperate for land to settle took advantage and encroached the Kalulu forest because at that time there was no one to prevent them from doing so.

It was also revealed that another cause of human encroachment in Kalulu forest was as result of family ties. Some people because of lack of access to land where they were staying decided to join their relatives in Kalulu forest. These social and economic factors they made the encroachment of Kalulu forest to be an ongoing situation. And if government through the Forestry Department will not find a lasting solution, the country will not have any forest reserves.

According to the WRM, it is at this level of underlying factors that solutions to deforestation and encroachment on protected forests should be found. FAO (2001b, 14) indicates that “economic and policy factors may be more important in the deforestation process.” This is because the poor are driven to their unsustainable practices by national and international forces with interests different from theirs. It is simplistic to just identify the activities that the poor are involved in as the causes of encroachment as this would be treating the symptoms and not the disease, the underlying causes. The underlying causes of encroachment in Kalulu ranges from political interference to social economic issues just as stated earlier.

5.5 Recommendations

The recommendations are made in line with the findings of this study, the following measures should be considered to ensure effective protection of the Kalulu National Forest and other forest reserves and at the same time safeguard the local people’s livelihoods.

- i. There is need for the government of the republic of Zambia to find an alternative land to resettle the squatters of Kalulu forest.

- ii. There is also a need to consider the social economic situation of squatters and urgently attend to the needs of the forest and the Forest department to build trust with the community who see them merely as enemies not as partners in development.

5.6 Future research

Kalulu is the catchment area, which needs protection to avoid contamination of ground water, which is supplied to the people of Kabwe town. Future research could be carried out to see the impact of the encroachment on the flow of ground water in Kalulu Forest. Further, a study can also be done to determine the level of contamination of the ground water in Kalulu Forest.

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APPENDICES

Appendix I Research Instrument

Research questionnaire for Forestry Department Officers

My name is Chama Cephas a postgraduate student pursuing a Masters of Disaster Studies (MDS) at Mulungushi University. I am required to submit as part of my research work assessment, a project on causes of human encroachment in Kalulu forest. To achieve this, you have been selected to participate in the study. I kindly request you to fill the questionnaire to generate data required for this study. This information will be used purely for academic purposes and will be treated in confidential and will not be used for publicity. Your name will not be mentioned in the report

Section A. Main economic activities

1. What was the primary objective of making Kalulu a Reserve Forest?

.....

2. Are you aware that Kalulu reserve forest been encroached?

Yes No

3. What do you think led to the encroachment of Kalulu Forest?

.....

4. As a Department responsible for management of forests, have you visited Kalulu forest since it was encroached? Yes No

5. What are the main economic activities that the squatters are involved in that lead to deforestation?

A. Agricultural B. Charcoal burning C. Lumbering D. Others (Specify

.....

6. How do you rate the current state of the Kalulu Forest?

A. Intact B. Deforested C. Not sure.

7. What are the main effects of encroachment on the forest?

.....

Section B: Department of Forest outreach programmes

8. As a department, do you have any sensitization programs for the squatters of Kalulu Forest? Yes No

9. If the response to question 10 is Yes, what are the main outreach methods do you use?

A. Radio B. Mobile P.A system C. Focus Group Discussions

D. Other, specify.....

10. If the response to Question 10 is Yes, what activities are undertaken during visitation of squatters of Kalulu Forest?

.....

11. If the response to Question 10 is Yes, how often do you conduct these programs?

A. Once per week B. Once per month C. Once per year D. Never

12. In your own opinion, do you think these programs objectives have been achieved? Yes No

13. If the response to Question 13 is No, what are the major constraints?

.....

14. If the response to Question 10 is Yes, how often do you conduct these programs?

.....

15. Suggestions to reduce human encroachments of Forests Reserves in Zambia

.....

Thanks for your participation

Interview Guide for Squatters / Headmen

Section A : Demographic profile

(Tick the appropriate box)

1. Gender: Male Female

2. Age Bracket

18-25 Years [] 26-35 Years [] 36-45 Years [] Above 46 Years []

3. Marital status.

Married [] Single [] Widow [] Widower []

4. Members per house hold.

0-2 [] 3-5 [] 6-8 [] More than 9 []

Section B. Socio – Economic Factors

5. Do you really know that Kalulu forest is the protected area?

Yes [] No []

6. How long have you been living in Kalulu forest?

Less than two years [] 2-5 yrs [] 3= 6-10 yrs [] More than 11 yrs []

7. Where were you living before you came to Kalulu?

.....

8. Main reason of relocating to Kalulu Forest?

Burning charcoal [] Farming [] Join my Family [] Poverty []

9. Where you in formal employment? Yes [] No []

10. If Yes, what made you leave employment?

Retirement [] Retrenchment [] None renewed of contract. []

Fired []

11. What are the main effects of encroachment on the forest?

.....

Section C: Main economic activities

13. What is your main economic activity?

Farming [] Charcoal production [] Lumbering [] Gardening []

Other (specify)

14. What are the main crops you cultivate?

Maize [] groundnuts [] sweet potatoes [] others specify

15. What is the main source of your income?

Agricultural Products [] Charcoal production [] Lumbering [] Formal employment [] If other, specify

16. Who are the main customers of your products?

FRA [] Residents of Kabwe town [] Government officials []

Section D: Department of Forest Outreach Programmes

17. Do you know about the forest department? Yes [] No []

18. Has the department of forestry members of staff being here to conduct any sensitization programs? Yes [] No []

19. If the response to question 10 is Yes, what are the main outreach methods do they use?

A. Radio [] B. Mobile P.A system [] C. Focus Group Discussions []

D. Other, specify.....

20. If the response to Question 10 is Yes, what activities are undertaken during their visitation?.....

21. If the response to Question 10 is Yes, how often do they conduct these programs?

A. Once per week [] B. Once per month [] C. Once per year [] D. Never []

22. In your own opinion, do you think these programs have helped you?

Yes [] No []

.....
23. Suggestions on how you can be helped?
.....

Thanks for your participation

GUIDE FOR FOCUS GROUP DISCUSSION

TYPE OF GROUP:

NAME OF ATTENDEES

DATE OF INTERVIEW/ DISCUSSION

START TIME:

END TIME:

1. Where did the people living in Kalulu forest come from and did they choose to come and settle here?
2. What made you to come and settle in Kalulu forest?
3. When did you come here and settle here?
4. How many villages that have been established?
5. Which village was the first one to be established in Kalulu forest?
6. Has the number of people in each village been known?
7. How do most of the people in Kalulu earn a living?
8. Do people who do not live in Kalulu come to farm there
9. Is transport especially to and from town easily available



The evidence of charcoal production by squatters in Kalulu forest.



Katutulu Primary School in Kalulu forest