IMPACTS OF TOBACCO PRODUCTION ON FOREST RESOURCES MANAGEMENT IN KASULU DISTRICT TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN NATURAL RESOURCE ASSESSMENT AND MANAGEMENT OF THE OPEN UNIVERSITY OF TANZANIA

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CERTIFICATION

The undersigned certify that has read and hereby recommend for acceptance by the Open University of Tanzania, a dissertation titled “Impacts of Tobacco Production on Forest Resources Management in Kasulu District, Tanzania” in partial fulfilment of the requirements for the award of a degree of Master of Art in Natural Resources Assessment and Management of the Open University of Tanzania.

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Dr. Reguli Mushy

(Supervisor)

……

Date

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DECLARATION

I, Fredrick Joseph Msigwa, do hereby declare to the senate of Open University of Tanzania that this research work is my own original work and has never been submitted for any degree award in any other University.

……..

Signature

……..……

Date

DEDICATION

I dedicate this research work to my lovely wife Joyce Jingu, my children Magdalena, Hilaria and Pascalina, who laid the foundation of this work. I really appreciate the moral and material support they provided to me.

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ABSTRACT

This study was set to examine the impacts of tobacco production on forest resources management in Kasulu District in Kigoma Region. Tobacco production is one of the major causes of deforestation in Kasulu District, due to its expansion and use of wood to cure tobacco. It aimed at; first, to examine the source of energy used in curing produced tobacco, second, to examine the impacts of tobacco production on deforestation and lastly, to examine the management strategies of forest resource in the District. It employed quantitative and qualitative approaches, whereas forest transition theory guided the study. The needed data was collected from a sample of 109 respondents using questionnaires, interview observation and documentary review techniques. The research findings revealed that tobacco cultivation and curing process incurred negative impacts on forest resources adding to deforestation, soil exhaustion and pollution due to the use of agrochemicals, consequently ecological disruptions. It was also disclosed that in Kasulu District average annual of 21 645 tones of firewood was consumed in tobacco curing process between 1991 and 1995. The study noted that lack of crop substitution to enable farmers to break out of tobacco farming has contributed to the destruction of forest resources. Thus, it recommends that the government in collaboration with leaf tobacco companies to identify alternative crops that can give greater income to tobacco farmers to enable them to break out of tobacco farming.

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LIST OF ABBREVIATIONS

SFC	Specific Fuel Consumption
IAEA	International Atomic Energy Agency
TTPMB	Tanzania Tobacco Producers and Marketing Board
W H O	World Health Organisation
DED	District Executive Director
LMICS	Low-income and Middle Income Countries
PFM	Participatory forest Management
UNITAB	European Association of Tobacco Growers – Paris France
FETRATAB	European Federation of Tobacco Processors - Rome Italy
EPR	Extended Producer Responsibility
UNESCO	Education, Science and Culture
CTRI	Central Tobacco Research Institute
URT	United Republic of Tanzania
SADC	Southern African Development Community

CHAPTER ONE

INTRODUCTION

1.1 Background of the Research Problem

Tobacco production originated in Virginia USA in the 17th century; In 1800, 70% of world tobacco production came from North America; then spread all over the world. Tobacco production shifted into developing nations of the tropics and subtropics around the1940s (Chivuraise, 2011). With production of this crop the world faces many environmental challenges. Healthy soil, an adequate supply of clean water and clean air are just a few of the basic necessities that enable humans to live, but which are strained by growing populations and the human demand for the Earth's precious resources (World Health Organization, 2017).

For instance, Tobacco threatens many of the Earth's resources. Its impact is felt in ways that extend far beyond the effects of the smoke released into the air by tobacco products when consumed (Chestnov, 2017). Worldwide, the harmful impact of the tobacco industry in terms of deforestation, climate change, and the waste it produces is vast and growing, and until now these aspects of the tobacco control picture have received relatively little attention from researchers and policy-makers (WHO, 2017).

Moreover, in Africa evidence indicates tobacco production is the major economic products which earn the countries a lot of foreign currency. For instance, the economy of Zimbabwe depends most on agricultural activities. Natural forests are utilized due to its cheapest accessibility. However, tobacco production is the major source of deforestation and a big threat to forest management in most African countries particularly Zimbabwe, even though the impacts are undermined or not

considered (Chivuraise, 2011).

Mapfumo, (2014) observes that in tobacco growing countries there is a permanent environmental damage from tobacco agriculture, particularly when associated with the deforestation necessary to increase farmland for tobacco growth and cure tobacco plants. For example, in most of African countries it is estimated that small scale farmers consume approximately 43m3 of fuel wood (15 000kg per year) to produce an average of 1400kg of cured tobacco (Scott, 2006). This translates to a Specific Fuel Consumption (SFC) of 10.7kg/kg of tobacco (Scott, 2006), which is approximately a third of the farmer' income (Scott, 2006). This situation is dangerous not only to the countries' economy, but also to the coming generation if the necessary measures are not undertaken to arrest the problem in the continent.

Similarly, tobacco is among of traditional cash crop grown in Tanzania introduced during the colonial period in the1930s. It is one of the major agricultural export crops in Tanzania which earn a lot of foreign exchange to the country (Kuboja, 2006). According to the World Bank crop production index, Tanzania's main exported cash crops were Tobacco, cashew nuts, coffee, tea, cloves, cotton and sisal. It is sold as raw materials; tobacco raw materials represents Tanzania's most important exported cash crop growing from USD 1969m worth of exports in 2010 to USD 318m in 2015

Most of tobacco farms are owned by small farming scale subsistence farmers in their small plots; they clear forest reserves for fuel wood used in the flue curing of Virginia tobacco or dark fire tobacco, also tobacco burley barn and kiln are built by

tree as poles, the incidence is common and applied in all regions cultivating tobacco in Tanzania in generally this is common to most of Low-income and Middle Countries (LMICS) (Sauer and Abdallah, 2007). Siddiqui and Rajabu (1996) showed that 14 kg of fuel wood is required to cure a kilogram of tobacco. Variations in wood resources consumption can be linked to a number of factors including the types of barns used, state and wood species and the knowledge of famers on the importance of improving tobacco curing efficiency.

According to Chestnov (2017), the quieter but shockingly widespread impacts of tobacco from an environmental perspective damage the environment in ways that go far beyond the effects of the smoke that cigarettes put into the air. For him, tobacco growing, the manufacture of tobacco products and their delivery to retailers all have severe environmental consequences, including deforestation, the use of fossil fuels and the dumping or leaking of waste products into the natural environment (Chestnov, 2017). On the other hand, Prisco (CNN, 2017) observes that every stage of the production of a cigarette in most in Tanzania has negative effects on the environment. This situation calls for management of environment, if necessary measures are not embarked on, one would expect nothing but the tobacco cultivation, processing, production and disposal is immensely harming the ecology.

Kasulu district is among the districts in Tanzania that engaged in tobacco production. Moreover, it goes without discussion that the crop provides employment to many Tanzanian particularly who live near the farms in Kasulu District. According to Siddiqui and Rajabu (1996) farmers produce tobacco in order to eliminate poverty. However, like in most regions which produce tobacco in Tanzania, it has been

proved that tobacco production in Kasulu District has negative impacts on the management of forest resources (Siddiqui and Rajabu, 1996). For example, from the start to the finish, the tobacco life cycle in the district is an overwhelmingly polluting and damaging process (Kuboja, 2006). Further, the district faces many environmental challenges. For instance, healthy soil, inadequate supply of water and clean air are just a few of the basic necessities that enable humans to live, but which are strained by growing populations and the human demand for the Earth's precious resources (Chestnov, 2017).

Table 1.1: Tobacco Production trend Kasulu District 2004-2009

District	**Metric Tons per Year**				
	2004	2005	2007	2008	2009
Kasulu	117,290	110,708	128,235	151,381.34	168,525.47

Source: National Bureau of Statistics (2015)

Similarly Chaturyedi (2017) observes that tobacco cultivation and the curing process in the district contribute towards deforestation, soil depletion, loss of soil nutrients and pollution due to the heavy use of agrochemicals. Furthermore, Chestnov (2017) asserts that the scale of the environmental damage resulting from tobacco use in Kasulu District makes clear how much there is more needs to monitor, counteract and manage the forest resources. It also highlights the need for a collaborative approach to tobacco control and management. This observation prompted the researcher to examine impact of Tobacco production and the forest resources management in Kasulu District in Kigoma Region, Tanzania. Thus, to fulfil this purpose the Mather (1992) forest transition theory will guide this study.

1.2 Statement of the Research Problem

Tobacco production worldwide, regional wide, country wide and at local level is a profitable crop which generates income to people and makes the better livelihood of families; thus, tobacco production has a lot of positive impacts to the people to be stopped. However, considering the effect of tobacco on the environment, forests and people's health; the World Bank in 1991 announced to no longer lend, invest or extend loans for tobacco production, processing or marketing. Tobacco production is still a global problem to third world countries including Tanzania.

The District of Kasulu is among of tobacco grower in Tanzania. Curing of tobacco leaves requires fuel wood which is not friendly to forest resource. The high demand of fire wood for curing of tobacco leaves in Kasulu District leads to more deforestation to the area of tobacco production leaving the land empty. Moreover, the situation calls for the forest resources management which will create a solution for this problem facing Kasulu District. The observation prompted the researcher to examine the impact of tobacco production and the forest resources management in Kasulu District in Kigoma region, Tanzania.

1.3 Objective of the study

1.3.1 General Objective

The general objective of this study was to assess the impacts of tobacco production on forest resources management in Kasulu District in Kigoma Region, Tanzania.

1.3.2 Specific Objective

i. To examine the source of energy used in curing tobacco in Kasulu District.

ii. To examine the impacts of tobacco on deforestation in Kasulu District.

iii. To examine the management strategies of forest resource in the tobacco production areas in Kasulu District.

1.4 Research Questions

i. What are the sources of energy used in curing tobacco in Kasulu District?

ii. What are the impacts of tobacco on deforestation in Kasulu District?

iii. What are the management strategies of forest resource in the tobacco production area in Kasulu District?

1.5 Significant of the Research Problem

This study intended to reveal the impact of tobacco production and the forest resources management in Kasulu District in Kigoma region, Tanzania. It may be of great value to some people as follows: This study enlightens and enriched the researcher with a knowledge and insight that he will not discover if he will not have undertaken this research work. The study will provide the adequate knowledge and skills that will guide tobacco producers in Kasulu District to manage forest resources more effectively; therefore, the research document

The study will stimulate research in new research areas that are likely to provide useful data to inform policy makers, planning decision and advocacy effort at local and other level of policy implementation. Hence the finding of the study will serve as reference for those working in forest resource management in Kasulu as well as country wise, regional wise and global wise. More important, it may help researchers to identify viable areas for further research and additional reference to researchers, who would opt to explore more on stress management strategies.

1.6 Scope of the Study

The study focuses on the impact of tobacco production and management of forest resource in Kasulu Districts in Kigoma Region. The study took place in the villages of Titye, Nyakitonto, Kitagata, Nyachenda and Mvugwe which are found in Kasulu District in Kigoma region. The study dealt with variables which were worked on in the field; tobacco curing methods, impacts of tobacco production, forest resource managements were independent variables of the study. Management of forest resource was discovered in tobacco production area of the study, a forestation and re-a forestation was discussed. Introduction of alternatives crops to prevent forest depletion, financing farmer with capital to practice other activities lather than tobacco production.

1.7 Limitation of the Study

Like other studies, this study had some limitations as stated below;

1.7.1 Respondents' Attitude on the Research Problem

Respondents took this exercise pessimistically, some informants tried to hide and provide false data necessary for this study. Moreover, the researcher clarified the significance of this study to the respondents and the society to enable them to give their opinion and view without any fear.

1.7.2 Accuracy of the Instruments

The informants' accuracy provided by the instruments was another limitation of this study. For the best results, the researcher applied pilot test to his instruments to satisfy himself that the proposed instruments are perfect and correct.

1.7.3 Time

Time is another challenge the researcher encountered with. The university provides a fixed time to collect data. This situation affected the data collection process this is due to the presence of unnecessary bureaucracies in government offices and the delaying return of questionnaires from respondents to comply with the university deadline.

1.8 Organization of the Study

The study is complied with literature review, subdivided into theoretical and empirical literature review; the definitions of the key terms, forest, forest policy, implementation and forest management related to the study; knowledge gap and conceptual frame work. The study also complied with research methodology, research approach, research design, the study area, the district population, district vegetation cover, social economic activities, study population, sample size and sampling techniques, validity and reliability of instruments, data collection, ethical considerations and data analysis.

The study has findings and discussion area, in this part different data relating to specific objectives of the study are presented; lastly the general description of respondents is presented to provide a clear picture of the nature of people who participated in the study. Lastly but least the study has the summary of the whole dissertation, conclusion, suggestions for further studies and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presents literature related to the study which is about the impact of tobacco production on management of forest resources in Kasulu District. It presents the theoretical literature review which contains definition of key terms, policy implementation, forest, forest policies, and forest management. The study has empirical literature review which contains global tobacco production, the production of tobacco in Africa, the production of tobacco in Tanzania, tobacco leaf production in Kasulu district. Knowledge gap and lastly the conceptual frame work.

2.2 Conceptualization of the Key Terms

2.2.1 Forest

The definition of the word forest differs from region to region and country to country; in this study the word has been defined as the land which is covered by tree having more than 0.5 hectares with trees higher than 5 meters. The forest should have a canopy cover trees with more than 10 percent of trees able to reach the thresholds in situ. The land should not include the area with agriculture activities or with urban land use. (FAO, 2015)

2.2.2 Forest Management

Forest management is defined as the state of utilizing the forest products without imposing reduction of its inherent values and future productivity also without causing undesirable effects on the physical and social environment. (FAO, 2012)

2.2.3 Forest Management in Tanzania

Forest management in this particular study is done by forest stake holders; for instance, Participatory forest Management (PFM) is a system of managing forests introduced in Tanzania according to the law from the forest Act of 2002, which provides a clear legal basis for communities, groups or individuals in Tanzania mainland to own, manage or co-manage forests under a wide range of conditions. (Blomley.T and Iddi.S, 2009)

2.3 Theoretical Literature

2.3.1 Forest Transitions Theory

This study is guided by Mather (1992) Forest transition Theory. The theory was introduced by Mather (1992) who observed that the dynamics of forest cover is captured in time dimension. This idea originally was developed from Whitaker's (1940) and Friedrich's (1904) the basic sequence of natural resource destruction and conservation. Their model argued that at an early stage, natural resource destruction is inevitable to meet human needs. The rising demand and price of natural resources will incentivise people to conserve and to restore their natural resources.

This assumption conforms with the observations of Waluye (1993) from the Journalists' Environmental Association of Tanzania when he stated that the Tanzania Tabocco Producers and Marketing Board (TTPMB) has enacted by laws whereby each villager would be forced to set aside 10% of his/her land to plant trees for housing and tobacco curing in order to arrest the situation. He, however, adds that regardless their advantages in most District councils in Tanzania these by-laws have been received reluctantly. The forest transition theory was supported by the steps

proposed by Angelsen (2009) who observed that the forest transition stages are arranged in four stages, the first stage is represented by high forest cover which revile low deforestation rate, the second stage represented by high forest cover reviling to high deforestation rate, the third stage is low forest cover reviling to low deforestation rate and lastly low forest cover reviling to negative deforestation rate.

Furthermore, it is encouraging to note that to date several agencies, including the International Atomic Energy Agency (IAEA), UNDP, and UN Organization for Education, Science and Culture (UNESCO) and WHO, have an explicit policy of non-collaboration with the tobacco industry (WHO, November 2016). Moreover, to achieve policy coherence, all UN agencies should review their interactions with the tobacco industry for compatibility (7^{th} Conference of the Parties to the WHO Framework Convention on Tobacco Control, November, 2016).

Equally, Yeamin *at al*. (2015) are of the observation that the environmental law should be strictly maintained in every community in Kasulu District especially from those villages producing tobacco. They moreover added that social awareness should be developed and some awareness program should be arranged to stop environmental degradation and deforestation; if the management of forest resources is to be successful and fruitful to the indigenous producing Tobacco in the District and for the coming generations.

2.4 Empirical Review

2.4.1 Source of Energy in Curing Tobacco

Like all plantation crops, tobacco requires clearing of fertile land. Since it is a

remunerative cash crop, it attracts farmers to clear more forests to reap more profits. This means that farmers may forsake planting subsistence crops, often risking far too much to earn money (Chaturvedi, 2017). Commercial tobacco farming according to the WHO (2017) takes place on a massive scale; for instance in 2012 it produced almost 7.5 million metric tonnes of tobacco leaf on 4.3 million hectares of agricultural land in at least 124 countries.

Further, the organization observes that tobacco is often grown without rotation with other crops (i.e. as a monocrop), leaving behind a lot of tobacco pests and diseases (Lecours, 2012). This means that tobacco plants require large quantities of chemicals to treat and control nuisance or outbreak of tobacco diseases. On the same consonance, curing tobacco involves larger amount of firewood, According to Central Tobacco Research Institute (CTRI) the production of tobacco consumes not less than 3000 lakh kg, whereby one may roughly estimate eight kg of wood is needed to cure one kg of tobacco. According to several studies it has been estimated that 24,000 lakh kg of wood is burnt every year for treating tobacco. This situation needs special attention if the forest resources in Kasulu District are to flourish.

Moreover, Chaturvedi (2017) observed that tobacco cultivation and the curing process add to deforestation, soil exhaustion, and pollution due to the use of agrochemicals and that manufacturing process of tobacco destroys environment. The tobacco industry is a heavy polluter and is enlisted under the ‘red category’ he asserts. Curing of tobacco, according to Chaturvedi (2017) causes air pollution; for instance, in the year of 2010 India is estimated to have emanated about 6750 tons of carbon dioxide for cigarettes production. In consonance of Chaturvedi (2017)

observation, Akhtar *et al*. (2015) note that a larger amount of firewood is required to cure tobacco leaves causing air pollution and trees are randomly logged. Furthermore, Akhtar *et al*. (2015) are also of the observation that tobacco plants that leaches nutrients from the soil cause the environmental degradation and pollution

2.4.2 Tobacco Production and its Impact on Deforestation

Tobacco-growing is often portrayed as one of the major causes, if not the main one, of deforestation in the world, especially due to deforestation for crop expansion and for use of wood to cure tobacco. According to Sacchetto (2012) tobacco cultivated surface has decreased by 14% in the last 20 years, showing increase only in a very small number of countries. It is very unfortunate that most of the tobacco grown world-wide does not make use of wood for curing, and in the cases where it does; there is also evidence of woodlot planting and responsible behaviour of the tobacco growers and the tobacco industry Sacchetto (2012) adds.

The Bellagio (1995) statement on tobacco and sustainable development concluded in the developing world, particularly in Kasulu District tobacco poses a major challenge, especially on environmental sustainability. WHO (2017) and further asserts that tobacco affects human well-being from an environmental perspective i.e. the indirect social and economic damage caused by the cultivation, production, distribution, consumption, and waste generated by tobacco products. Tobacco production is considered to pose “a particularly difficult dilemma for development,” as it generates a range of employment, income, foreign exchange, and other cash-contributing effects, while the damage to public health and to the environment in the long term appears substantially to outweigh the benefits (Geist, 1999).

Likewise, he observed that approximate data for the mid-1980 suggested that Virginia (flue-cured) tobacco consumes between 82.5 and 175 million cubic metres of round wood harvested worldwide each year for curing, and that this translates into the equivalent of 1.2–2.5 million hectares of open forests or woodlands removed annually. In addition to the destruction of forest resources, Akhter *et al* (2008) argue that tobacco production is responsible for the displacement of food and other economic crops in Bangladesh. For example; the very fertile region of Kushtia (the second largest tobacco-producing district in the country) had been a food surplus region.

Moreover, Lecours *et al*. (2011) stated that unlike many food crops, tobacco production offers no replenishment to the soil or to other parts of the farm ecosystem. They add that the biomass (stalks or plant residue) left after harvest is of no food value to livestock and poultry. They further observe that the stalks or plant residue are required to be cut and burnt to reduce tobacco diseases and weeds before onset of another planting season. In turn, the diminished animal resources reduce animal manure, which is essential to maintain soil health in developing countries.

Similarly, MacKenzie *et al*. (2011) observes that for many farmers, particularly, but not exclusively, in Kasulu District, tobacco is considered an important source of income. They also assert industry control of tobacco growing and the leaf trade has resulted in cycles of indebtedness, particularly among farmers contracted directly by leading cigarette manufacturers. In supporting of the idea, Lecours *et al*. (2011) stated that studies show that contract farming creates a cycle of indebtedness for farmers, who find them owing companies significant sums for payments advanced as

agricultural inputs year after year. For many tobacco growers in India and Bangladesh, the income gained from this system is barely insufficient to meet the most basic of their needs.

For them, by actively controlling the production system and the sale of agrochemicals, multinational tobacco companies around the globe encourage the use of products that have proved very harmful to environmental and human health and have essentially indentured the small tobacco farmers within the production system. However, in the year of 1989 to 1990 the loss of forest cover per year due to tobacco curing was estimated to be 13000 ha in Tanzania. Siddiqui and Rajabu (1996) identified that tobacco curing in regions which cultivate tobacco was the second larger consumer of wood after the domestic sector (Geist, 1999).

2.4.3 Tobacco Production in the World

Tobacco production started in Chesapeake Bay area of Virginia during the 17th century and was an enterprise for settlers making use of contract and slave labour to colonize natural environments (Geist, 1997). In 1800, 70% of world tobacco production was concentrated in North America. Tobacco spread all over the world since the initiation of the American Revolution and the breakdown of the colonial rule (Goodman, 1995). For the first time in history, tobacco production shifted into the developing nations of the tropics and subtropics around 1940s (Geist, 1997).

These nations have more fragile ecosystems than the temperate regions especially when it comes to fuel wood supply from natural forests. Production of tobacco leaf increased by 40% in 1971, during which 4.2 million tonnes of the leaf were

produced and in 1997, 5.9 million tonnes of the leaf were produced (FAO, 2010). Tobacco leaf production is expected to reach up to 13.1 million tons by 2020. In addition, currently, every year 9.7 million tons are produced throughout the whole world and the top producers are China 39.6%, India 8.3%, Brazil 7.0% and United States 4.6% (FAO, 2010).

2.4.4 Tobacco Production in Africa

Tobacco is also a cash crop in Africa with its production increasing from 250 000 tonnes to 500 000 tonnes during the past 20 years (Geist, 1998). In 1996, African production exceeded the European production for the first time in history of commercial tobacco (Geist, 1998). Tobacco is dominantly grown in countries which are rich with the miombo woodlands. These countries fall in the SADC Region, that is the Southern African Development Community. Zimbabwe, Tanzania and Malawi produce about 75% of all tobacco produced in the continent. In addition, Tanzania is ranked among the top 20 tobacco growing countries in the world and has consolidated its third position of being one of the largest producers in Africa (after Malawi and Zimbabwe) (FAO, 2008). Geist (1998) stated that 90% of tobacco produced in Africa comes from countries covered by miombo woodlands.

In the world, Africa's contribution to tobacco production is the least though most of the active nations are producing at their maximum. Malawi, Zimbabwe and Tanzania are the very active nations in Africa participating in tobacco production (FAO, 2008). These countries do not produce for consumption but rather produce for export as they do not process the product (FAO, 2008). The issue is flue and fire cured tobacco are not naturally cured by air or sun but rather require artificial energy.

Therefore, this causes the cutting down of indigenous forests for curing if there are no other alternatives. However, in Zimbabwe most large scale commercial farmers use coal as another alternative as well as gum plantations (Eucalyptus). Zimbabwe produces more of Virginia (flue cured) whilst Malawi produce more of burley (air cured) tobacco (FAO, 2008).

2.4.5 Tobacco Production in Tanzania

Tobacco is one of the cash crops produced by most smallholder farmers in Tanzania (Kafanabo, 2008). It improves the living standards of the farmers as it attracts a considerably higher selling price compared to other cash crops such as cotton. Historically, this crop was the single most important export commodity in the economy and has dominated value of agricultural production from the late 1980_s (Rweyemamu and Kimaro, 2006).

Table 2:1 Tobacco Production Trend (2000–2010)

Year/season	Area (ha)	Yield (t/ha)	Production (tone)
2000/01	76000	2.65	202000
2001/02	71000	2.33	166000
2002/03	54000	1.51	82000
2003/4	41000	1.58	65000
2004/05	56000	1.33	75000
2005/06	27000	2.03	55000
2006/07	53000	1.05	79000
2007/08	62000	1.10	68000
2008/09	48000	1.33	64000
2009/10	67000	1.27	93000

Source: FAO, 2010

The potential for tobacco expansion has not been anticipated partly because of the world campaign against smoking and also because of lack of infrastructure

(Rweyemamu and Kimaro, 2006). Virginia tobacco is highly rewarding in financial terms but at the same time it is associated with high cost of production. Virginia tobacco is produced most entirely in Tanzania for export (Kuboja, 2011) Generally, there has been a decline in the production of tobacco from 2000 to 2005. The production has since increased in the year 2006 to 2010. This could be due to the increase in number of tobacco farmers. In 2005/ 2006 the yield was very high though in terms of area planted and production it was low. If the trend is maintained it means the production of tobacco continues to grow and hence the call for environmental sustainability. To this end, all efforts must be made to improve on quantity and quality of our tobacco and conserve the environment.

2.4.6 Management Strategies of Forest Resources in Tobacco Production Area

While anecdotal evidence supports the finding that tobacco could be substituted with other crops that may be equally profitable, a systematic analysis of this issue is needed. According to WHO (2017) there are must a natural starting point that would be a thorough and comprehensive analysis of the effects of removing farmers from tobacco production all together on economic variables such as employment, skills, output, and wages. Moreover, farmers, according to the recent research, have shown that smallholder farmers are receptive to shifting out of tobacco production when conditions allow.

In order to scale up these initiatives, however, results show that government policies and programmes are needed to improve market structure, public extension services and subsidies, and access to credit and loans for alternative crops (Leppan *et al*., 2014). In their recommendations, Yeamin *et al*. (2012) observed that necessary steps

should be taken to establish adequate storage facilities in the rural areas so as to decrease the risk of damaging crops and ensure proper price to the farmers. Interestingly, the comments also was supported by the 1983 World Conference on Smoking and Health where John Madeley presented a paper on deforestation in Kenya caused by tobacco farming reported that the paper "created a wave of concern in the international tobacco control community and elicited a recommendation by delegates that UN agencies must cease supporting tobacco growing and examine deforestation problem (Ely and Leach, 1983).

Furthermore, a third key tactic of the tobacco industry, to counter deforestation concerns, was involvement in, and even leadership of, forestation efforts (reforestation and a forestation) (Kelley *et al*, 2016). The industry rejected the "rash of stories condemning transnational tobacco company activities in developing nations (Institute, 1980) instead blaming lack of government action for deforestation; Where Third World governments have generally encouraged the development of tobacco, their forestry departments have often been slow to recognize the need for reforestation. The report adds that tobacco companies have, therefore, taken the initiative, encouraging farmers to plant trees either individually or on a cooperative basis, even providing free seedlings for both depleted forestland and new land (Institute, 1980).

Moreover, Kelley *et al*. (2016) observe that the claimed success of BAT's program in Kenya led the Tanzanian Permanent Representative to the UN in Geneva to request "human and financial resources… for an a forestation program" towards "arresting or minimising the environmental degradation that tobacco growing causes

in developing countries". The seventh session of the conference to the WHO (November, 2016) in the suggested that the Extended Producer Responsibility (EPR) principle should be adopted to establish take-back, clean-up and disposal programmes, to help keep TPW out of the environment. The conference added that while these initiatives should be funded by tobacco producers, they should be carried out completely independent of the tobacco industry. They further observed that the establishing EPR would also contribute to positive public health outcomes, such as decreased social acceptance of tobacco use and higher costs for tobacco products (WHO, 2016).

2.4.7 Research Gap

The reviewed literatures highlighted the impacts of tobacco production on management of forest resources, but they have discussed the tobacco production in a different context. For instance, Mwita (2016) worked on the Shifting Cultivation, Wood Use and Deforestation Attributes of Tobacco Farming in Urambo District, Tanzania, but his study did not deal with tobacco production on management of forest resources in Kigoma region particularly in Kasulu District. On the other side, the reviewed literature also revealed that what lead most tobacco producers to concentrate in producing tobacco is different from one place to another, for example, while Chivuraise (2011) dealt with the economics of smallholder tobacco production and implications of tobacco growing on deforestation in Hurungwe District of Zimbabwe.

This study is dealing with tobacco production on the management of forest resources in Kasulu District in Tanzania. This circumstance prompted the researcher to

conduct a study to examine the impacts of tobacco production and management of forest resources in Kasulu District in Kigoma Region Tanzania. The study also specifically aims at examining the source of energy used in curing produced tobacco in the District, the tobacco production and its impacts on deforestation and to find out the management strategies of forest resource in the tobacco production area in Kasulu District in Kigoma Region, Tanzania.

2.5 Conceptual Framework

Figure 2.1 is the conceptual framework which gives coherence to the empirical inquiry, and the significance of empirical evidence as the research problem is concern. It consists of two variables which are independent and dependent variables; tobacco production is an independent variable, whereas management of forest resources is dependent variable. The framework consists of intervening variables that may manipulate both independent and dependent variables. The researcher presumes that if well managed tobacco production can reduce poverty, provide employment and boost up the community's development in Kasulu District and the opposite is the same, whereby tobacco production can bring about the community development dilemma, deforestation and poverty.

On the other hand, the government policy must also favour the forest resources management and the trade unions must stand firm to protect forest resources and order tobacco industries to adhere to the forest resources management as per the government policy. With the above observations the researcher concurs with the statement that incurring costs in reducing land resources degradation must be the aim of any rational policy as nobody consciously tries to degrade the woodland

resources; rather it is an inevitable consequences.

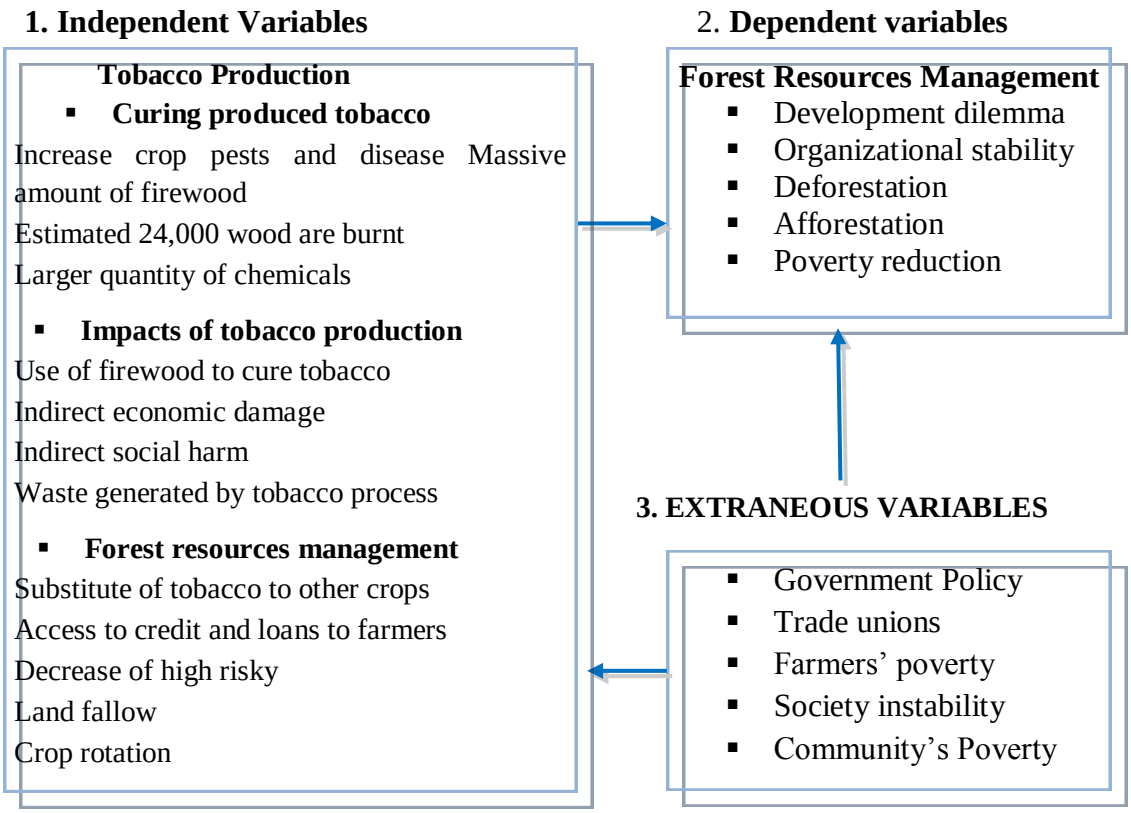


Figure 2.1: Conceptual Framework

Source: Adopted from Tusiime (2012)

2.5.1 Independent Variables

2.5.1.1 Curing produced Tobacco

It is inevitable the process of curing tobacco leaves leads to the massive destruction of forests; the use of fire wood to cure tobacco leaves leads to high deforestation rates in Kasulu tobacco production areas.

2.5.1.2 Indirect Economic Damage

The cultivation of tobacco leaves enhance the utilization of industrial fertilizers; the phenomenon creates the large quantity of chemicals in the soil. The production of

tobacco leaves encourage the outbreak of diseases to tobacco plant. This is common when monoculture farming system is applied; the plants become vulnerable to diseases. The whole process leads the farmer to incur the large amount of money to treat diseases and the retaining of soil fertility. In other ways the government and nongovernmental organizations incur a large amount of money to rehabilitate affected areas by afforest ate ting and re- afforest ate affected areas.

2.5.1.3 Indirect Social Harm

Tobacco production has leads to indirect social harm; the production is termed as deadly product. Most of the tobacco users suffer from respiratory organ diseases like cancer and TB, leading them to fail to participate in production activities. The tendency of concentrating more in tobacco production as a cash crop leads the outbreak of hunger and malnutrition in the farming societies.

2.5.1.4 Waste generated by Tobacco Process

Tobacco wastes generated during tobacco processes has negative impacts to human being; for instance cigarette butts and other tobacco products wastes are thrown in urban areas. This is common in Kasulu town. Cigarette butts and other tobacco wastes contain poison known as nicotine and carcinogens are also dangerous to human being.

2.5.1.5 Forest Resource Management

The production of tobacco has both negative and positive impacts to tobacco producers locally, regional, country, as well as world wise; but in most of the third world countries the production creates the big environmental, health, social and

economic loss to people, the best solution is to make a substitute of the crop to other crops that are economic, social, beneficial and friendly to our environment such as coffee, tea, cassava, and cotton.

2.5.1.6 Access of Credits and Loans

The access to credit and loans is be the best solutions to tobacco producer, the loans and credits can make tobacco producer to concentrate in other social economic activities rather than concentrating in a single economic production activity. The phenomenon can enable people to attain financial capital.

2.5.1.7 Decrease of high Risk

When people engage in different economic activities can be able to maintain their economic status finally they can end up by stopping degrading the forest resources. The risk of forest resources will become in a low level.

2.5.1.8 Land fallow and Crop Rotation

Land fallow and crop rotation can enable farms to be in a healthy condition in terms of natural soil fertility; the farms become more productive than previously.

2.5.2 Dependent Variable

2.5.2.1 Development Dilemma

The use of forest resource during curing of tobacco can accelerate development dilemma; the incidence is common to third world countries which does not have other alternative means of curing their tobacco, at the same time they lack financial and technological assistance. Tobacco production leads a lot of problems to people such as environmental degradation, economic problems, health problems and social

economic problems leading to development dilemma.

2.5.2.2 Organization Dilemma

Tobacco production can lead organization stability; this can take place when tobacco producer manage their forest resources sustainably; the community and individuals can benefit financially and manage to afford to provide their basic needs to their family, at the same time the whole organization, the country and globally will become stable in the aspect of forest resource management.

2.5.2.3 Deforestation

Tobacco production has a linkage to deforestation, curing of tobacco in some of developing countries use fire wood to cure tobacco thus lead to over utilization of fire wood as a source of tobacco curing. The use of fire wood to cure leaf tobacco is the main causative of forest degradation

2.5.2.4 A Forestation

Most of the third world countries use fire wood to curry their tobacco leaves, fire wood acts as a source of drying energy; over utilization of forest resource tends to be very high, and the land becomes bared. The recommended technique to be applied is a forestation. Good forest resources management depends on a forestation strategy.

2.5.2.5 Poverty Reduction

The use and implementation of the government forest policy will help to reduce poverty in the society; the farming system applied would be in a sustainable mode enhancing all sides to benefit for the future and the present generation.

2.5.3 Extraneous Variables

2.5.3.1 Government Policy

Forest resource management can be reinforced by good implementation of government environmental policies which is done by tobacco producers, the same as the substitute of tobacco to other crops. Forest resource management always depends on the implementation of government environmental policy by tobacco farmers.

2.5.3.2 Access to Credit and Loans

Accessibility of loans and credit to tobacco farmers can improve the life standard of tobacco farmers. Loans and credit can change tobacco farmers to be stable economically, socially and healthy. Farmers becomes free to do any useful economic activity which are friendly to environment lather than depending on tobacco farming which is not friendly to the environment. The accessibilities of credit and loans in the societies are enhanced by the availability of trade unions in the societies.

2.5.3.3 Farmers' Poverty

Farmers' poverty and community poverty can enhance deforestation and development dilemma to tobacco farmers as well as the whole community. When farmers become poor they can do any illegal farming activities that are not friendly to our environment. In other side can also hinder the forest resource management activities to take place.

2.5.3.4 Society Instability

Society instability is another extraneous variable which can hinder resource management activities to take part within our societies; society instability is not a

matter of being in war but also the state of famine, hunger and poverty can cause social instability. All in all the above elaborated variables work together to accomplish the task of forest resources management

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a way to solve systematically the research problem (Kothari, 2008). In it people study the various steps that are taken on in considering his/her study along with the logic behind them (Kothari, 2008). It is a discussion of the methods that the researcher will be using and more importantly, why he is using them and how he intends to go about it and the shape it will ultimately take (Thomas, 2009). This chapter covered among others; the research approach, research design, study area, geographic location of the study, climatic condition and topographic condition of the study area, the district population, vegetation cover, social economic activities, study population, sample size and sampling techniques. Others were validity and reliability of instruments, data collection, ethical considerations and data analysis, there after Kiswahili and languages were employed as a means of medium in collecting data.

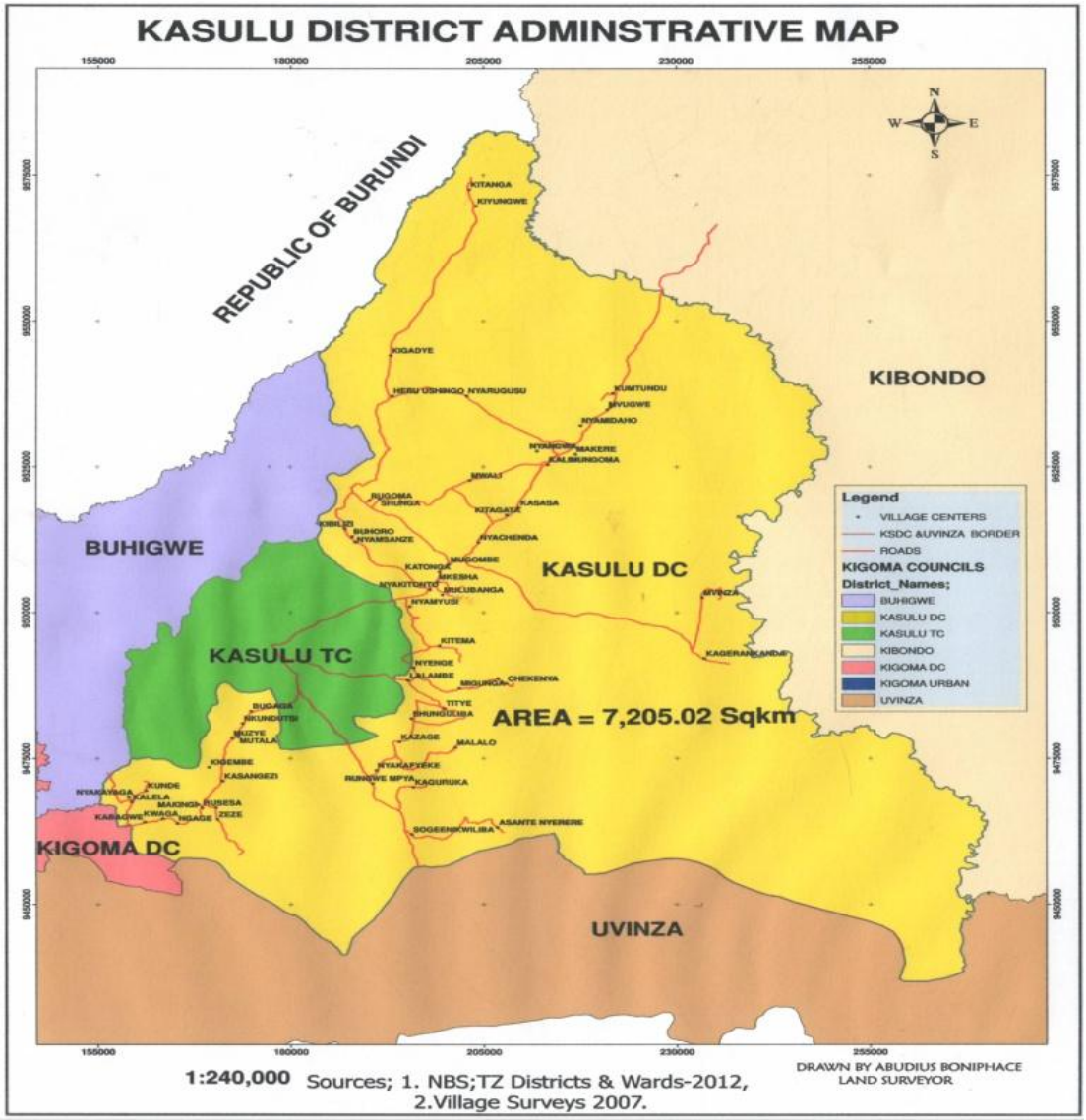
3.2 Description of the Study Area

3.2.1 Geographical Position

Kasulu District is among of the six districts of Kigoma region. Its land covers 7205.02 square kilometres which is 25.2% of the land area of Kigoma region (URT, 2006). It is located between $3^0$45' and $5^0$00'latitudes south of the equator and between $29^0$50'and $3^0$055'east of Greenwich (URT 2008; Njahani 2009). Kasulu District is boarded to the North by the Country of Burundi, to the East by Kibondo District, to the south by Uvinza district, to the west by Kigoma district and to the

northwest by Buhigwe district. Figure 3.1.

Figure 3.1: Kasulu District Administration and Location Map



Sources: NBS TZ Districts & Wards 2012; Village Surveys 2007

The study centred in the five villages in Kasulu District and the study took place between January and April 2019.The concerned villages are Titye, Nyakitonto, Mvugwe, Nyachenda and Kitagata. The choice of the area was due to the following reasons; the area has suitable soil fertility which is favourable to the growth of tobacco, the area has also good climatic condition suitable to the growth of tobacco.

Data were collected within the area of the study in Kasulu district compared to other villages in Kasulu District. The study area had the population of 168,631 people (Tanzania population District ward lake zone 2012). The Population provided enough information to carter the need of the study. What is more, the District has many tobacco producers totalling to more than 2600 suitable to give the right information. More importantly, it seemed that no one attempted research study on this research problem in Kasulu District; the researcher; therefore, found it important to examine the impact of tobacco production and the forest resources management in Kasulu District in this particular area.

Figure 3.2: Study area Location: Kasulu District
Source: Cartographic unit, Geography Department University of Dar es Salaam

3.2.2 Climatic Condition and Topography

Kasulu district has a tropical climate with the average temperature ranging between 20^0C and 30^0C. The altitude of the district ranges between 1, 200 and 1,500 metres above sea level (URT, 1998; 2008). The area has the annual mean rainfall of about 1,100mm and the annual rainfall ranges between 600 mm and 1600 mm per annum, mostly distributed along the highlands. The pattern of the rainfall is uni-modal with the rainy season lasting from October to May, followed by a prolonged dry season. Precipitation is reliable and allows a wide range of crops to be grown with some double planting of short season crops. Lowland areas are warm for most part of the year, except for June when the nights are cool (URT, 2008).

3.2.3 Vegetation Cover

Kasulu district is composed of Miombo woodland forest. Its vegetation cover has the characteristics of grasslands, swamps and wood lands. The forest and woodland in Kigoma region as well as in Kasulu districts have various valuable trees species like Pterocarpus angolensis, Khaya Nyasica, Afzelia quanzensis, Milecea exelsa, Brachysteqia spiciformis and Pterocarpus (WTEP, 1997; URT, 1998; 2008).

3.2.4 District Population

According to the 2012 Tanzania National population Census and House hold Survey, the population of Kasulu district was 634,038 (304867 males and 329,171 females) with a total of 85572 households with an average family size of 7.3. The district comprises of 30 wards with 90 villages (URT, 2013).

3.2.5 Social Economic Activities

The main social economic activity practiced in Kasulu district is subsistence farming (small scale agriculture) which contribute to more than 80% of the district income as the contribution of local economy to the nation income generation, (URT, 2008). The major crops grown include maize, beans, cassava, bananas, ground nuts, palm oil, coffee, cotton, rice and tobacco. The crops are grown through rain fed agriculture, (URT, 1998; 2008). Apart from that miombo woodland area are important for beekeeping and hunting activities.

3.3 Research Approach

Research approach refers to the fundamental set of principles and general procedural guidelines. Approaches are road maps that are associated with research purposes or scientific interests (Thomas, 2009). The researcher employed the mixed approach in achieving the research objectives. He believed that both paradigms in this study would produce complete results that neither approach could have made if used alone (Tusiime, 2012). The quantitative and qualitative approaches balanced each other and integrated into the structure of one study.

Moreover, they are considered vital in analysing and getting the solution of the problem by knowing the stance of respondents and analyzing to what extent forest resources management strategies can affect the performance tobacco producers in the District. In this context, the researcher used the quantitative process to allocate meaningful numerical values to qualitative data, and he qualitatively analysed and assigned meaning to quantitative data (Tusiime, 2012).

3.4 Research Design

The research design is a plan for studying the research problem that specifies the type of data, the methods to be employed to collect them and how the collected data will be analysed (Thomas, 2009). The researcher used cross-sectional survey research design in which the researcher studied different categories of study subjects or participants at one reference point in time (Tusiime, 2012). It helped the researcher to discover the incidences, distribution and interrelationships among the variables. It allowed the researcher to collect a larger amount of data from a sizable population in an economical way (Saunders *et al* 2007). The collected data were standardised allowing easy comparison and more important, the data gathered by the survey strategy is unlikely to be as wide- ranging as those obtained by other research approaches (Saunders *et al* 2007)

3.5 Population sample

The study population of this study were the household farmers both males and females heads of households living in the selected location. Household's heads were used in this study because they were good source of information and possessed a varied experience in the village. The unit of the study therefore were the rural household farmers. In this aspect, the population involved tobacco farmers, ward agricultural extension officers and villages chair person as key informants.

3.6 Sample and Sampling Procedures

This study employed probability and non probability sampling techniques whereby every member of the population had a chance of being selected to join the sample.

The researcher applied simple random sampling because all member of the population had an equal chance of being chosen to enter in the sample (Adam and Kamuzora, 2008). Non probability sampling technique involved a complete list of tobacco experts and village chairpersons; in this sampling technique an individual is selected according to his/her position or his/her qualification in selected villages in Kasulu District.

3.6.1 Sample Size

Adam and Kamuzora (2008) define sample size as the exact number of items selected to constitute a sample. The sample represented the population as much as possible. The study sample involved 109 participants made of 99 tobacco farmers,5 village chairpersons and 5 ward extension agricultural extension officers as key informants. Bailey (1994) notes that for studies which statistical analysis is to be done, a sample greater than 30 (>30) is required further more Manyika (2000) explained that the best sample to represent the population should not be less than 5% of the population under investigation regardless to its population size. The numbers of the population sample of the tobacco farmers' households for each village were obtained by calculating the percentage of each number of the tobacco farmer's households of the concerned village. The following formula was applied in identifying 99 respondents for this study:-

$$\mathbf{n} = \frac{\mathbf{N}}{\mathbf{1} + N(e^2)}$$

n = sample size

e = sampling error

N = total number of tobacco farming household

Given

N=1036,

e = 0.1

Thus,

$$n = \frac{1036}{1 + 1036\ (0.1^2)}$$

$$n = \frac{1036}{1037 \times 0.01}$$

$$n = \frac{1036}{10.37}$$

$$n = 99$$

Table 3:1 Distributions of the selected Sample

Villages	Tobacco farming households	Sampled Households	Chairperson	Wards Tobacco expertise	Total
Titye	220	21	1	1	23
Nyakitonto	300	29	1	1	32
Kitagata	116	11	1	1	13
Nyachenda	250	24	1	1	26
Mvugwe	150	14	1	1	16
Total	**1036**	**99**	**5**	**5**	**109**

Source: Field Survey (2019)

The total number of each tobacco farming village households was obtained; the whole five villages' tobacco farming households summed to 1036; then the percentage of each village farming households were computed from the total number of the five households of the whole study area. This provides the number of tobacco farming households to be visited by the researcher.

3.6.2 Sampling Procedures

The sampling technique provides a range of methods that enabled the researcher to collect only data from a subgroup rather than all possible cases or elements (Saunders, 2007). The sampling included the households' tobacco farmers from five villages. A total of 99 tobacco farming households were obtained to compose the sample of this study regarding to Barley, (1994) who stated that a sample greater than 30 (>30) is required to represent the entire population. Then, the proportion numbers of each village tobacco farming households marked to 109 were randomly selected from each village to compose the sampled tobacco farming households.

Random sampling is defined as the process of sample selection method whereby every member of the population has known and none zero probability of being included in the sample. (Elder, 2009) The numbers of each village farming households were obtained, and then the percentage of each village number of the households was obtained; from there simple random sampling was applied to get the representative sample to work on, the names of each village tobacco farming households of the population were written on pieces of papers using a computer. The named villages' pieces of paper were placed in a special box, and then shacked; the named pieces of papers were selected.

The researcher visited the district agriculture officer and asked him to get the feedback about the leading tobacco farming villages in Kasulu District; the five villages were nominated and chosen to be worked on. The selection used non probability sampling procedure (purposive sampling) depending on intensity of tobacco farming in Kasulu District. The selected villages were Mvugwe, Nyachenda,

Kitagata, Nyakitonto and Titye. On the other hand, 5 village chairpersons participated in this study because each village has one chairperson. Also the researcher involved ward agricultural extension officers with varied ages and different experiences in the tobacco production. Purposive sampling was applied to key informants. Key informants involved in the study were five village chairpersons and five ward agriculture extension officers. The researcher experienced informants to have enough required information on tobacco production challenges during tobacco curing against forest management.

3.7 Data Collection Methods

Research methods are tools the researcher uses to collect data (Saunders *et al.*, 2007). The researcher used both quantitative and qualitative research methods, which involved questionnaire, interview and documentary review techniques. Creswell (2005) describes data collection as the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses and evaluate outcomes.

Research information was collected using primary and secondary data source of information. The use of interview technique was employed to collect research information from key informants. Secondary data was obtained from different literature review source of information such as dissertations, research works, books, journals and publications from internet search. Other researches in formations were obtained from different offices such as district government and local government offices, as well as villages' offices around the study area. The study employed questionnaire for tobacco farmers' households.

3.7.1 Questionnaires

The questionnaire is defined as the tool of data collection in which each person is asked to respond to the same set of questions in a predetermined order (Saunders *et al*, 2007) The researcher distributed 99 copies of questionnaires to 99 tobacco farmers household's member's in five villages in Kasulu District.; some questionnaires were translated in Kiswahili particularly to those who felt difficult in English most of them were those who did not attend primary school (6.2%) also to some of standard seven levers (55.4%), a week later the researcher collected the filled in questionnaires.

The questionnaires were administered by some participants who helped the researcher to collect the information in detail. The questionnaire technique was employed to collect information from house hold participants, because of its merits propounded by Kothari (2008); low costs to visit a wide area in the study area, the respondents have enough time to think and give adequate answers from questionnaire questions. Questions were provided to respondents in a written form. They were asked to state their gender, their age, and education level. The type of energy used in curing tobacco leaves and how often used, if they are aware when using the type of energy to cure tobacco leaves destroy forest resources, where do they get the knowledge if they are aware, why?, if they have other source of energy used to cure tobacco leaves apart from the one they used, they were supposed to mention them.

Moreover, respondents were asked to give their opinions on the impacts of tobacco production and forest resources management., They were asked to mention hectors

do they own, how many tonnes of fire wood they use to cure their tobacco, to give their suggestions on the impacts of tobacco production on deforestation. They were asked to respond if they have current possible solutions to eradicate problems caused by tobacco production, if yes and if no why? They were asked if they are satisfied with forest resources management on tobacco production, if yes or no why? They were asked to state if they have attended any training on how to preserve the forest resources, if yes or no why? Lastly they were asked to give their opinions on how to manage the forest resources.

3.7.2 Interviews

According to Saunders *et al.* (2007) an interview is a purposeful discussion between two or more people. The interview assisted the researcher in collecting valid and reliable information which were relevant to the research questions and objectives. Interview guide for this study was a semi-structured interview, which used to collect information from research respondents. In the study, key informants were interviewed. Primary data was collected from interviewee. The researcher was in a position to control the respondents and flexible as it allowed the interviewee and interviewers to decide on the language to utilize. Furthermore, it was used for triangulating the collected data.

The interview guided questions were provided to focus groups. They were asked to state the source of energy used to cure tobacco and how often, if they were aware the curing of leaves tobacco using fire wood destroy forest resources, other means of curing tobacco leaves apart from the one used, their opinion on the impacts of tobacco production and the forest resources management. How do they feel when

producing tobacco, hectors they owe, tonnes of fire wood used to cure tobacco? They were asked if they plant trees to manage the forests, if they are satisfied with the types of management, the procedures used to preserve the forests, the training attendance on forest preservation, lastly their suggestions on management of the forests.

3.7.3 Focus Group Discussions

According to Mbogo *et al.* (2010) focus group discussion technique is conducted by the researcher with a group of participants, who are considered to be representatives of the target population. Focus group discussion is among of research tool used as a qualitative approach to obtain a deep understanding of social issues. Focus group discussion is mostly common used in conservation research. (Nyumba *et al,* 2018), The researcher was interested in knowing how people responded to each other's views and built up a view out of the interaction that took place within a group. The method is more flexible and time effective than an individual interview; the researcher worked from the list of topics; listening, thinking, exploring, framing hunches and ideas (Sundhanayak, *et al*. 2009).

Likewise, it enabled the researcher to explore avenues of importance, which raised other issues than those listed on the questionnaire. The researcher visited three focus groups from three villages, MDYABIBI focus group from Mvugwe, Ondoa Umaskini Kasulu (OMAKA) focus group from Titye village and Galula manamba from Kitagata village. MDYABIBI focus group has 11 members, 9 males and 2 females. OMAKA focus group has 12 members, 11 males and 01 female. Galula manamba of Kitagata village has 10 members, all were males. Each group was under

their chair persons; the chair persons lead the discussions. The chairpersons were assigned specific information to discuss. They were asked to mention the type of energy used to cure their tobacco leaves, how often?

They were asked if they are aware to destroy forest resource when use the source mentioned to cure their tobacco leaves, other source of energy used apart from that mentioned, their opinion on the impacts of tobacco production and forest resources management, if they are satisfied with management of forest resources on tobacco production, lastly they were asked to respond if they have attended any training on how to preserve forest resources.

3.7.4 Documentary Review

Documentary review according to Kothari (2008) is secondary data that have already been published or unpublished. In this study, the researcher analysed and reviewed the documents, which were involved, but not limited to papers presented at the meetings, books, newspapers, journals, and newsletters, research dissertation and proposal. This technique provided the additional information concerning to implementation of management of forest resources.

3.7.5 Observation

Observation is defined as the process or data collection method used in social science where by a researcher observes within a specific research field, a researcher can collect different data about people, processes and culture. (Kawulich and Barbara, 2005) In the study the researcher observed forest management method used by tobacco farmers of planting trees around tobacco farm in Titye village, also

observed the bundle of fire wood prepared by among of tobacco farmers in Titye village.

3.8 Data Analysis

Adam and Kamuzora (2008) define data analysis as the computation of certain measures along with searching for the patterns of relationship that exist among data groups. Data analysis served the purpose of showing the results of the study by pointing out areas for further studies and clarifying on the statistical methods (Kombo and Tromp, 2006). The researcher recorded the data using field notebooks and tape recorder. Adam and Kamuzora (2008) define data analysis as the computation of certain measures along with searching for the patterns of relationship that exist among data groups. The researcher recorded the data using field notebook, edited, coded and analysed using both quantitative and qualitative data analysis techniques. Statistical data analysis was undertaken by using Microsoft Excel, which enabled the collected data to be presented in this study through graphs and pie charts the percentage were also calculated by the researcher.

3.8.1 Quantitative analysis

Quantitative research method is defined as the type of educational research which is concerned with objective measurements, statistical, mathematical and numerical analysis of data collected through polls, questionnaires or by manipulating existed statistical data using computational techniques. (Babbie, 2010) The study analyzed collected data obtained through questionnaires provided to respondents and key informants and the manipulated existed statistical data from different literature. Data were analyzed by using Microsoft excel. Graphs and pie charts were produced also

related to the data obtained in the field using questionnaires. Tables were drawn and filled with numerical figures depicting respondents' responses answering research questions and other questions relating to research objectives like age distribution, marital status, education level, source of energy used to cure tobacco leaves, tones of fire wood used to cure tobacco, impacts of tobacco on deforestation in Kasulu and management strategies used to preserve forest resources.

3.8.2 Qualitative analysis

Qualitative research is defined as empirical research where the data are not in the form of numbers; they stress on how people interpret and make sense of their experiences to understand social reality. The data were generated through the use of interview, focus groups and observable reality. (Moharan, 2018), The study used qualitative data to portray information obtained in the field; the information was obtained from tobacco farmers by means of focus groups and respondents opinions in questionnaires. Respondents provided their comments and opinions which were noted in the researcher note book. The respondents were asked to state if they were aware to destroy forest resource when using fire wood to cure tobacco leaves, they were asked to give opinions on the impacts of tobacco production and forest resources management. The field work information was presented in a form of qualitative data.

3.9 Validity and Reliability

3.9.1 Reliability

Reliability is defined as to the extent to which the researcher's data collection techniques or analysis procedures yield the consistent findings (Saunders *et al,*

2007). In this study, reliability was guaranteed by employing two data collection methods which allowed triangulation of information collected. The study has five data collection methods which were used to collect the data; the questionnaire, the interview, focus group discussion, documentary review and observation. Among of the five, two of them which seemed to have a doubt were testified to verify the truth; the testified tools were questionnaire and interview guide

3.9.2 Validity

Saunders *et al*. (2007) define internal validity about questionnaire as the ability to the questions to measure what the researcher intends to measure. The researcher employed content validity to see whether questionnaire contained a fair sample of items to measure the attributes of interests of the study. And to ensure the usefulness of the research instruments, the questionnaires and interview guide approved their validity by pilot testing. The researcher visited tobacco farmers in Asante Nyerere village in Kasulu district and employ the tools to three farmers; the research tools were well understood and known to farmers; they filled the questionnaire without any assistance from the researcher correctly and measure what the researcher intended to measure in the study.

3.9.3 Ethical Consideration

The term research ethics was defined by Hickey (2018) as the guideline which supports a researcher to do his research work without causing any effect during his research process. In this study the ethical issues were considered; the researcher received the introductory letter from the University Authority which acted as a permit to go for the research work. After that, the permit letter was obtained from the

RAS-Kigoma which allowed the researcher to collect data from the sampled villages. The letter was sent to DED Kasulu; the DED allowed the researcher to proceed with data collection process in identified villages. Participants information confidentiality was considered, their information were kept confident to avoid someone to be at risk of being harmed. Plagiarism was considered the researcher quoted and cited appropriately, where original material obtained.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents data with regard to the impacts of tobacco production on forest resources management in Kasulu District in Kigoma region, Tanzania. The presentation is arranged in line with the specific objectives that guided this study: First, to examine the source of energy used in curing produced tobacco, second, to examine the impacts of tobacco on deforestation, and lastly, to examine the management strategies of forest resource in the tobacco production area in Kasulu District in Kigoma Region, Tanzania. Moreover, general description of respondents is presented so as to provide a clear picture of the nature of people, who participated in the study.

4.2 Social-economic Characteristics of Respondents

The term social economic characteristics in a social science research is defined as economic status of a group of people having the same characteristics in different sphere of life like level of education, social and economic stands, ethnic back ground, heritage and income generation, occupation, recreation, transportation and shopping activities which can influence the living standards people. (Babatunde *et al*, 2017)

The socio-economic characteristics of the respondents of the study involved: gender, marital status, age and education level. The study revealed that 62 percent were males and 38 percent females; indicating the sample to be attributed by the cultural issues whereby most of the household properties including land and wealth are

owned by men. Furthermore the capital for tobacco production is not owned by many females (Kuboja *et al*, 2012).

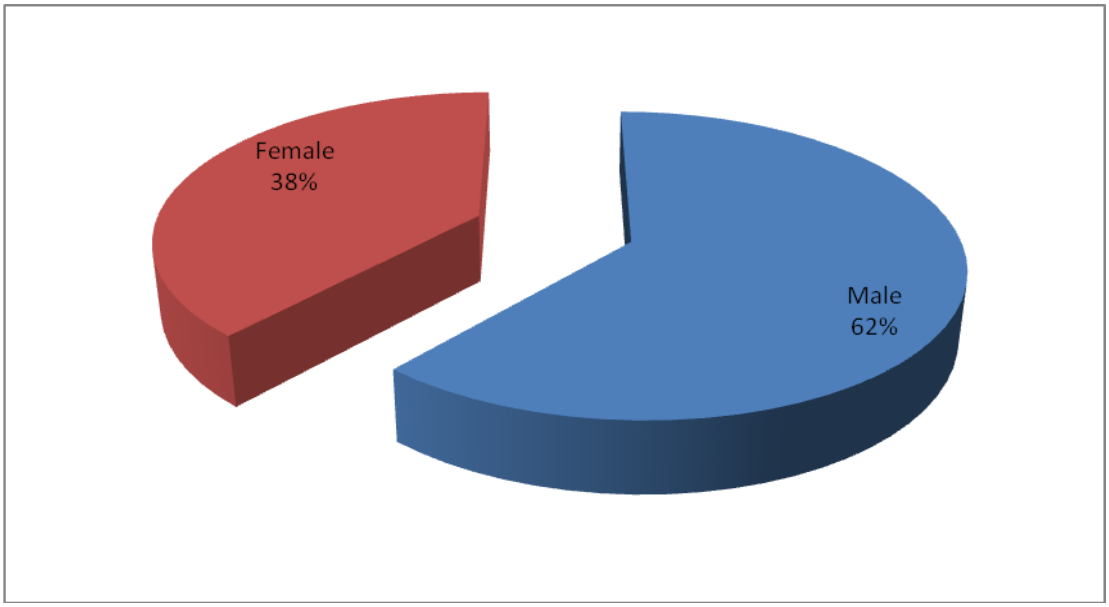


Figure 4.1: Distributions of the Respondents Gender

Source: Field Data (2019)

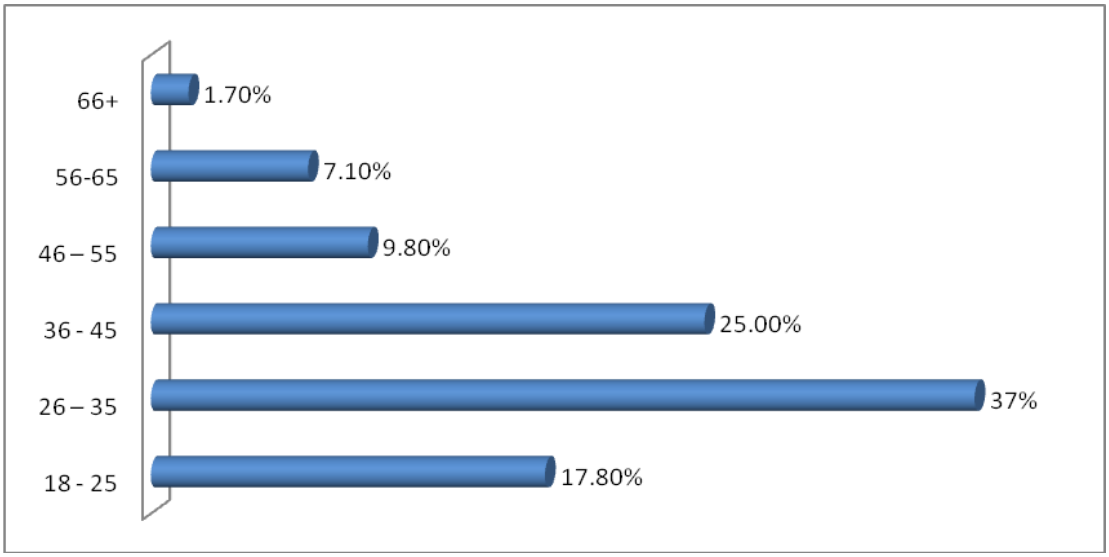


Figure 4.2: Age Distributions of Respondents

Source: Field Data (2019)

In the study the married respondents accounted 71% and 28% unmarried; this reveals that unmarried people contribute less in tobacco production activities

compared to married people. In the study tobacco working force aged 26-35 years are energetic people as a whole this group generates more income in tobacco production than other groups in the study area. More than 50% of respondents that is 55.4% of tobacco producer were standard seven leavers this reveals that they are self employed in tobacco farming cash crop and other food crops. Fig 4.1 and 4.2

4.2.3 Education Level of Respondents

The participants were required to state their level of education so that the researcher may have a clear knowledge of the nature of respondents was working with in this study. Figure 4.3 summarises their responses.

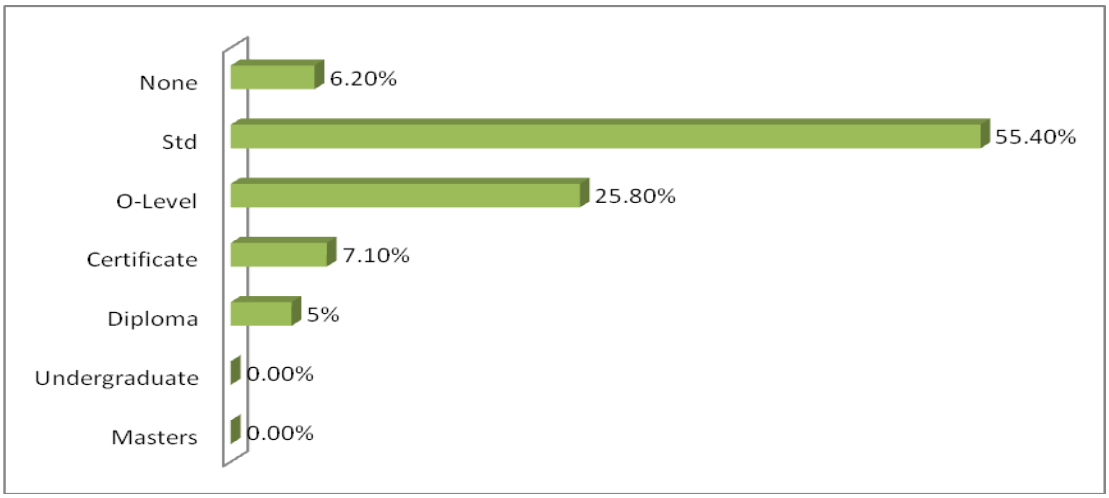


Figure 4.3: Education Level of Respondents

Source: Field Work (2019)

The findings show that more than half of all respondents (55.4%) of were standard VII leavers, whereas a quarter of the respondents (25.8%) were Ordinary level leavers. 6.2% of respondents did not attend any school and 5% of participants were diploma holders. The findings imply that Masters, and undergraduate holders are not participating in tobacco production; it may also imply that it is because they have other means of earning their lives.

4.2.4 Marital Status of Respondents

The participants in the study were required to identify their marital status.

Figure 4:4 illustrates marital distributions of the participants;

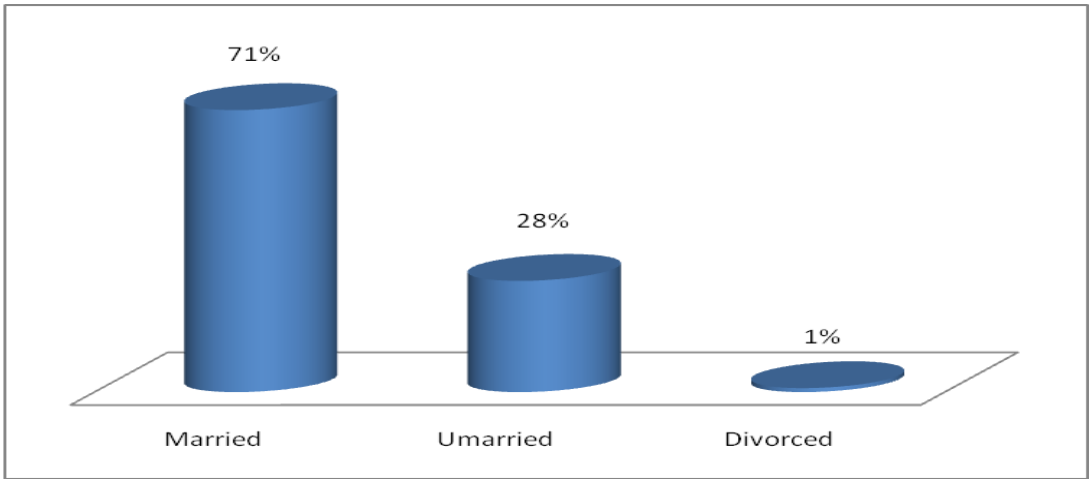


Figure 4.4: Marital Distributions of the Respondents

Source: Field data, 2019

The results indicated that the majority were married accounted to 71% compared to 28 % of unmarried respondents and divorced 1% who participated in the study. The uneven marital distribution may suggest that there are few unmarried young men, who participated in the study. This also indicates that several young men get married soon after completing their standard seven and engage themselves in farming activities tobacco production in particular.

4.2.5 Main Economic Activity of Respondents

Nyakitonto, Mvugwe, Kitagata, Nyachenda and Titye villages were the study area of the researcher. The respondents' main economic activity of the study area is small farming agriculture; apart from farming activities they have additional source of income, hunting, beekeeping (honey and beeswax gathering) and livestock keeping.

(URT, 1998), The main economic activity practiced in Kasulu district is subsistence farming (small scale agriculture) which contribute to more than 80% of the districts' income as the contribution of local economy to the nation income generation, (URT, 2008). The major crops grown include maize, beans, cassava, bananas, ground nuts, palm oil, coffee, cotton, rice and tobacco. The crops are grown through rain fed agriculture, (URT, 1998; 2008). Apart from that miombo woodland area are important important for beekeeping and hunting activities.

4.2.6 Land Ownership and Means of Land Acquisition

The acquisition of the land in the study area was identified through focus groups discussion, all of the asked members explained to own and acquire the land through relative inheritance; they inherit from their fathers, uncles, nephew, cousin and mothers. The ownership of the land in tobacco producing wards in Kasulu District is determined by the village Act no.5 which governs the land in village areas. In general all land in Tanzania is owned by the president but the rights of the land can belong to citizens under the customary rights governed by customary law applicable in the area. (URT, 1999) In Kasulu District the land is allocated to individuals under customary laws through the village government; but the most common means of land acquisition is by inheriting the land from their relatives and purchasing from village members.

4.3 Sources of Energy in Curing Tobacco

The findings on the research objective one were collected to answer the research question one.

4.3.1 Type of Energy Farmers use to Cure Tobacco

The participants were requested to state type of energy they usually use to cure their tobacco. 99 participants responded on the question, as shown in Figure 4:5

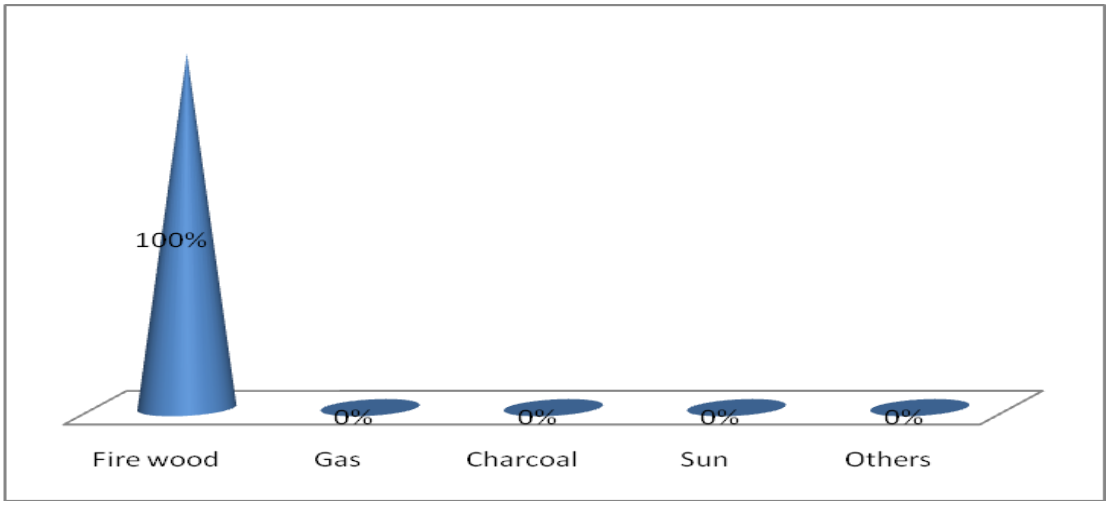


Figure 4.5: type of Energy used
Source: Field Data (2019)

Figure 4:5 illustrates that 100% of respondents used firewood to cure their tobacco. The findings imply that there is a need of taking precaution if the forest resources are to be preserved for the future generations. They predict that the hastening of using firewood is leading the District into calamity. The interviewee asserted that noticing this speed of cutting off the trees, the 1983 Agricultural Policy among others came with the agenda of using the renewable energy resources and introduction of improved efficiency barns for curing tobacco to reduce the use of wood fuel. Likewise, studies in the country have revealed that an average of 14 kg of fuel wood is consumed to obtain 1 kg of cured tobacco. Moreover, it was revealed that the emission of CO is 0.6% of total volume. It is estimated that 0.6 hectare of woodland have to be cleared to cure 1 hectare of tobacco, leading to deforestation rate of 13,000 hectares per annum.

Alternative sources of energy to fuel wood should be developed. In consonance with the above ideas, Chaturvedi, (2017) observes that since it is a remunerative cash crop, it attracts farmers to clear more forests to reap more profits. This means that farmers may forsake planting subsistence crops, often risking far too much to earn money. Consequently, the tobacco industry, according to Chestnov (2017), damages the environment in ways that go far beyond the effects of the smoke that cigarettes put into the air. Figure 4.6 Source of tobacco curing in Titye village.

Figure 4.6: Source of Energy Used To Cure Tobacco Leaves In Titye Village

Source: Field Data (2019)

4.3.2 Informants Awareness on Depletion of Forest Resource using Fire Wood as a Source of Curing Energy

The researcher was interested to know whether the respondents are aware that the energy they use to cure tobacco destroys the forest resources. Figure 4.7 summarises the results.

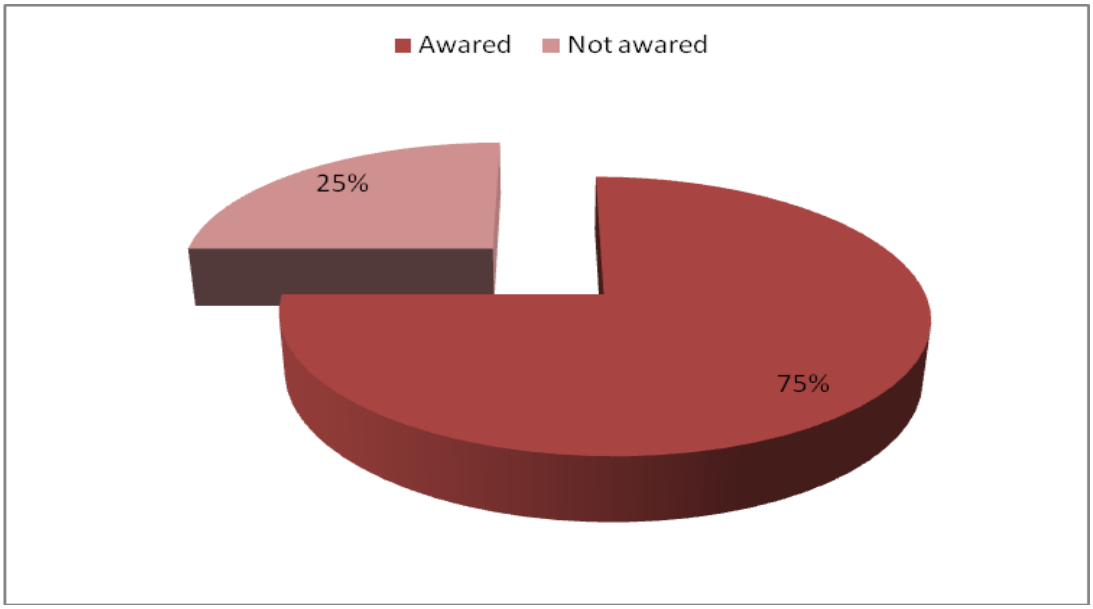


Figure 4.7: Respondents Awareness on destroying Forest Resources

Source: Field Data (2019)

Figure 4.7 indicates that 75% of respondents showed that they are aware that clearing the forest lead to land degradation in one hand. 25% of participants were of the opinion that they do not know whether firewood used to cure tobacco destroy the environment. The interviewees agreed that they were taught on the impact of curing tobacco in destroying the forest resources. The findings above revealed that tobacco producers are aware on the impact of using firewood to cure tobacco lead to the deforestation and drought. However, few of them revealed that they don't know of what are the impacts of tobacco production on the environment.

According to Chestnov (2017) the fact that today most people are aware of the health impacts of using tobacco moves us one step closer to a world where a billion people are less likely to die from the consequences of chewing, smoking or ingesting tobacco. But successful advocacy to reduce the health impacts of tobacco have not

been matched by successes in challenging other impacts from tobacco including on the environment – all of which can affect a District's development (Chestnov, 2017).

On the other hand, the interviewees were of the observation that the current lack of scientific research into the environmental impact of tobacco leaves policy-makers often poorly informed on the true consequences of consumption that result from the cultivation, production, distribution, and waste of what is a highly addictive diseases. In consonance with this ideas, respondents observed that the alarming rise in tobacco consumption and related deaths has turned the battle for tobacco control from one focused primarily on educating a sceptical public about tobacco's health threat to one involving public engagement on the subject of the severe effects of tobacco on the environment.

4.3.3 Tobacco Production Problems

Tobacco producers like other human, also face predicaments in producing tobacco. This idea interests the researcher to find out whether face energy problems in the process of curing tobacco. A total of 106 respondents attempted the question. Figure 4.7 summarizes their responses. The findings in Figure 4.8 indicate that tobacco producers in Kasulu District face predicaments with regards to energy used to cure tobacco, even though there are more predicaments than the one they are facing with energy. This has been revealed when the 64% of informants agreed to face the problem, 32% of participants asserted that they have no problem with regards to energy when they want to cure tobacco.

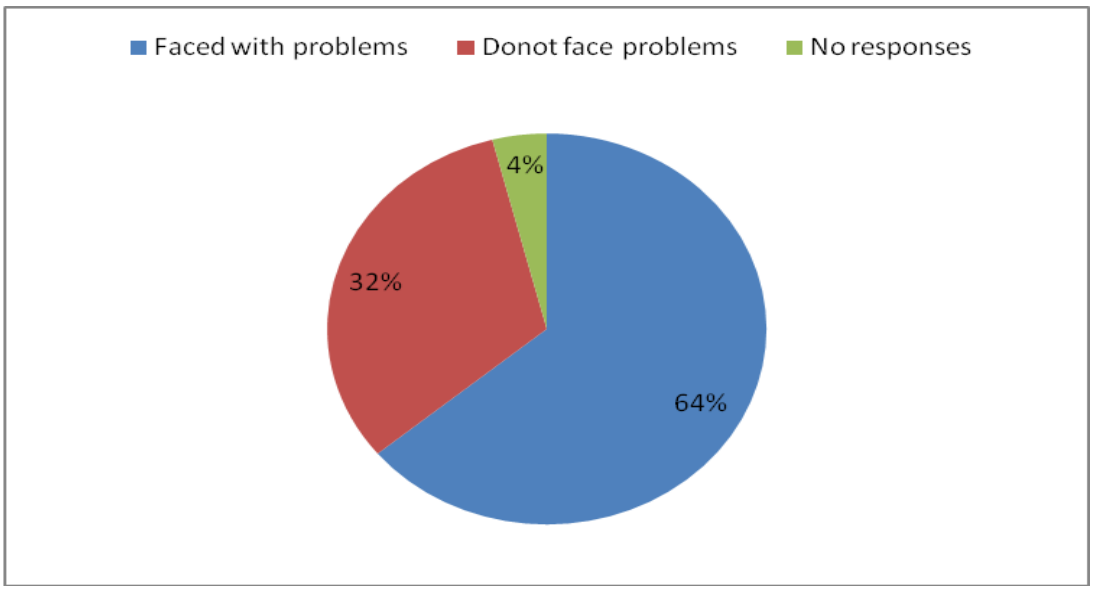


Figure 4.8: Tobacco Production Problems Response

Source: Field Data (2019)

Moreover, most interviewees were of the opinion that it is true that energy especially firewood is a problem they normally encounter when they want to cure tobacco, but they pitted against powerful multi-national tobacco leaf companies that give the farmers loans so they can buy inputs such as seed, fertilizer, and pesticides, but because the price they can get for their harvest is decided by the leaf companies, which grade the leaves and set the price, tobacco farmers are often trapped in a vicious cycle of poverty and indebtedness and that after they have paid their loans tobacco producers income is often in the negative.

In consonance with the above idea, Kibwage *et al*. (2009) observed that farmers bear the risk if a natural disaster or other crop failure. With the increasing cost of imported inputs, the farmers may find themselves in lifetime debt bondage. Even when farmers sell their crop under the auction system, the advantage that should accrue to them when a buyer bid against each other disappears when competition is

limited (Kibwage *et al*, 2009). Likewise, the focus group discussions participants noted saying that more land devoted to tobacco farming means less arable land available to grow other crops for food, which she mentioned it as another problem facing their society. The interviewee in the focus group discussions added;

> *"Clearing land for tobacco growing, the cutting down trees to cure tobacco, and the depletion of soil nutrients as a result of tobacco farming all has negative effect on growing staple crops. This contributes to malnutrition in the communities that farm tobacco. Tobacco farming further diminishes food security in these countries."*

4.3.4 Respondents Suggestions with regards to Tobacco Production on Forest Resources

Table 4:1 summarizes the respondents' propositions with regards tobacco production on the forest resources.

Table 4.1: Respondents' Suggestion with regards to impacts of Tobacco Production and Forest Resources

Responses	Frequency	Percentage
Encourage a large scale effort to push for tobacco crop substitution such as coffee, maize etc.	20	18.1
Implement research have already identified alternative crops that can give greater income to tobacco farmers.	19	17.2
Government should enable farmers financially to break out of tobacco farming.	20	20
There must be empirical evidence to show impacts of tobacco farming on environmental degradation.	14	12.7
International organizations such as the World Bank must sponsor farmers' crop substitution projects.	28	24.5
There are must be effective tobacco control regulations to protect indigenous from smoking.	08	7.2
Total	**109**	**99.7**

Source: Field Data (2019)

Table 4.1 indicates the suggestions of the respondents on what must be improved or done to foster rectify the environment from being degraded at the same time restore people healthy and income leading them to better living standard. For instance,

24.50% of participants were of the opinion that the international tobacco control community, in corroboration with the international organizations such as the World Bank, the Food and Agriculture Organization, and humanitarian organizations can play an important role in improving the health and livelihood of tobacco producers by providing them the knowledge and skills as the options, by supporting and sponsoring crop substitution projects.

Likewise, the findings disclosed that 18.1% of respondents suggested the government to encourage a large scale effort to push for tobacco crop substitution such as coffee, maize etc to enable farmers to break out or reduce of tobacco production. However, crop substitution may require sustained efforts with financial and technical support from the international or the government to boost up farmers. According to the opinions this substitution will demonstrate the alternative ways to alleviate poverty among the indigenous. The government was also suggested to encourage people to stop smoking for smoking prevalence in most people is still not high. This suggestion was forwarded because without effective tobacco control regulations, the market potential in the country for the tobacco industry can be immense.

Equally, the government was suggested to encourage people to stop smoking for smoking prevalence in most people is still not high. This suggestion was forwarded because without effective tobacco control regulations, the market potential in the country for the tobacco industry can be immense. As the World Health Organisation (2018) observes that many countries that produce tobacco are low- or middle-income countries and some of them face substantive food insecurity, and even hunger. For

him land used to grow tobacco could be more efficiently used to achieve SDG 2, zero hunger.

4.4 Contribution of Tobacco Production on Deforestation

The findings on the research objective two were collected to answer the research question two.

4.4.1 Tobacco Production Farmers Willingness

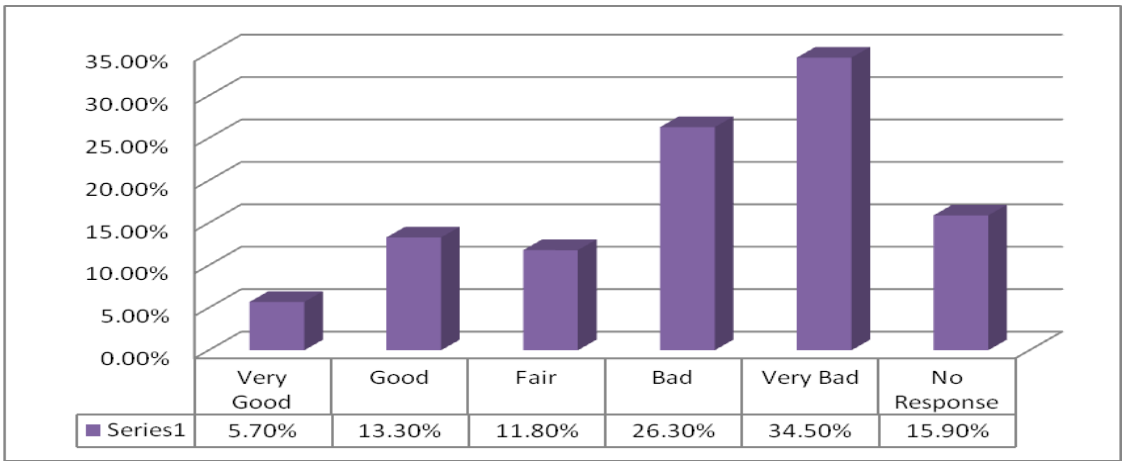


Figure 4.9: Farmers Willingness in Producing Tobacco

Source: Field Data (2019)

The question number one in the second objectives intended to state whether farmers are willing to produce tobacco. The researcher intended to know the force behind causing them to continue practising tobacco farming; their explanation verified the real situation in the study area. Thus, respondents were requested to respond to a closed-ended question (Likert Scale) to show how strongly they agree or disagree and whenever necessary to provide some explanations. A total of 98 respondents attempted the question, while 11 respondents did not. Figure 4.9 illustrate their responses;

The findings in Figure 4.10 illustrates that 34.5% of respondents were of the opinion that they feel very bad in producing tobacco, while 26.3% of respondents felt bad to produce tobacco. Interestingly, 15.9% respondents did not attempt the question. On the other hand, most interviewees were of the opinion that they are all uncomfortable to produce tobacco, but low income and climate conditions oblige them in this production. The results in Figure 4.8 disclosed that most respondents are willing to produce tobacco, but the situation forces them to do so. For instance, participants in the focus group discussions revealed that farmers were told not only by the companies, but also the government officials that the tobacco improves farmers' life standards; it relieves household poverty and generates export earnings.

This was revealed in Figure 4.8 whereby the 34.5% respondents stated that they are not comfortable to produce tobacco that means they know the impacts of this industry to their lives and health. For instance, tobacco production is considered to pose a particularly difficult dilemma for development, as it generates a range of employment, and foreign exchange, while the damage to public health and to the environment in the long term appears substantially to outweigh the benefits (Geist, 1999). However, the researcher was pessimistic to know why 15.9% did not attempt the question. So, he was interested to know from 34.5% of respondents who said that they feel very bad to produce tobacco. One of the interviewee said;

> *"Tobacco farmers are often trapped in a vicious cycle of poverty and indebtedness because the price they get for their harvest is decided by the leaf companies, which grade the leaves."15.3.2019*

4.4.2 Land area of Tobacco owned by Farmers

The researcher was interested to know the hectares of tobacco owned by the

informants. A close-ended question was posed and a total of 99 respondents attempted the question.

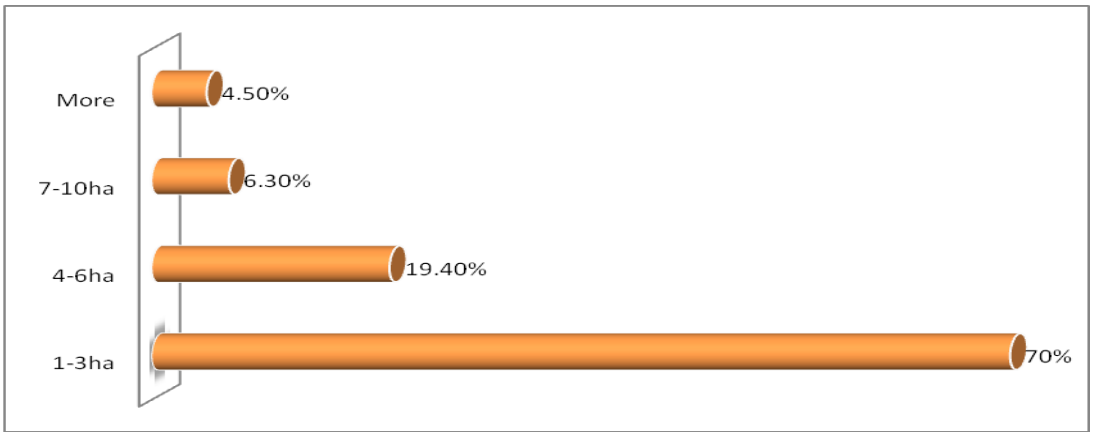


Figure 4.10: Hectares owned by Farmers
Source: Field Data (2019)

The results in Figure 4:9 show that 70% of informants identified to own 1-3 hectares, while 6.3% of informants own 7-10 hectares of tobacco farms. Figure 4:9 also revealed that there are farmers, who own more than 10 hectares of tobacco. The results above reveal that the hectares farmers own determine the costs of environmental damage and it is very unfortunate that policy-makers are often poorly informed on the true consequences of the land affected by this industry. The interviewee was quoted saying that there is lack of scientific research into the environmental impact of tobacco result from the cultivation, production, distribution, and waste of unnecessary tobacco production.

In relationship to the above ideas, WHO (2017) reveals that there is a clear chain of environmental damage throughout the tobacco cycle, from growing and curing to manufacturing and distribution; and from the effects of consumption to post-consumption waste. However, it must be clear that growing tobacco negatively impacts the environment, it is even worse when the land covered is thousands of

hectares. A literature review published in 2012 showed that tobacco farming, particularly in low- and middle-income countries, leads to deforestation because of the clearing of land for tobacco farming with agrochemicals such as pesticides and fertilizers that are used extensively (Gest, 1999). As the interviewee observes:

> *"It is common to find farmers growing tobacco on small farms; farm workers are often family members, including women and children, but the nature of the industry is destructive."15.3.2019*

On the other hand, it was revealed that World production of tobacco leaf has continued to grow since 2003, up 25% from 6.03 million tons in 2003 to 7.5 million tons in 2012. African countries produced 650,000 tons, or 8.7% of the world production of tobacco leaf in 2012, and total area harvested for tobacco in African countries increased by 66% and output increased by 48%, Kasulu District included.

4.4.3 Tones of Firewood Consumed by Farmers

The open-ended question was posed to the informants requesting them to state roughly the tones of firewood they consume in the process of tobacco production. Figure 4.11 summarizes their responses.

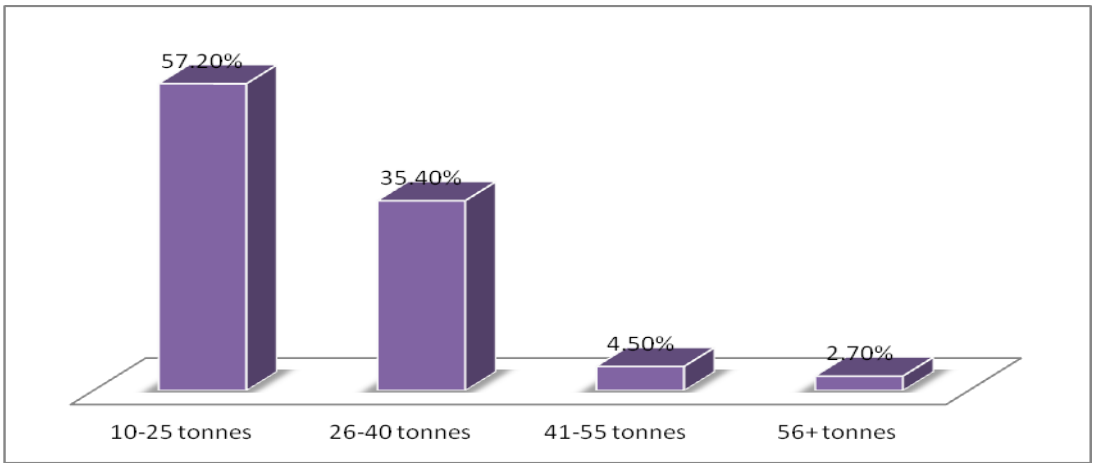


Figure 4.11 Tones Farmers consume in Tobacco Production
Source: Field Data (2019)

Figure 4.11 indicates that 57.2% of respondents use between 10-25 tones of firewood, whereas 35.4% of respondents utilized 26-40 tones. The less use of firewood is 2.7% of informants who just use 57% tones of firewood to cure the produced tobacco. Likewise, the interviewees agreed to have been using a lot of firewood to cure tobacco adding that they are forced to do so because they have no other means, even though they are aware that the means destroy their environment.

The results disclosed that most tobacco farmers respondents use tones of firewood to cure the produced tobacco its implication is obvious that in Kasulu District environment is endangered if immediately measures are not taken, one expects degradation is a cause of climate change, soil erosion, reduced soil fertility and disrupted water cycles, the situation that puts the District at a risky. The idea is in consonance with a recent investigation into the production, promotion and use of tobacco in developing countries estimated that for every 300 cigarettes produced (about 1.5 cartons), one tree is used just to cure the tobacco leaf. One of the interviewee was heard asserting that;

> *"Tobacco growing and curing (the drying of the tobacco leaf) are both direct causes of deforestation, because we clear forests to plant tobacco and we later burn wood to cure tobacco." 25.3.2019*

Geist (1999) also observed that approximate data for mid-1980 suggested that Virginia (flue-cured) tobacco consumes between 82.5 and 175 million cubic metres of round wood harvested worldwide each year for curing, and that this translates into the equivalent of 1.2–2.5 million hectares of open forests or woodlands removed annually. However, in the year of 1989 to 1990 the loss of forest cover per year due to tobacco curing was estimated to be 13000 ha in Tanzania (Geist, 1999). Similarly,

Lecours *et al*. (2011) further are of the opinion that the stalks or plant residue are required to be cut and burnt to reduce tobacco diseases and weeds before onset of another planting season.

4.5 Forest Management Strategies and Tobacco Production

The findings on the research objective three were collected to answer the research question three which states; what are the management strategies of forest resource in the tobacco production area in Kasulu District in Kigoma Region, Tanzania?

4.5.1 Current Possible Solutions

The closed-ended question was posed to the informants requesting them to state whether there are currently have positive solutions to arrest the environment in Kasulu District. Out of 109 respondents; 105 respondents answered the question, while 4 did not respond. Figure 4.12 summarises their responses;

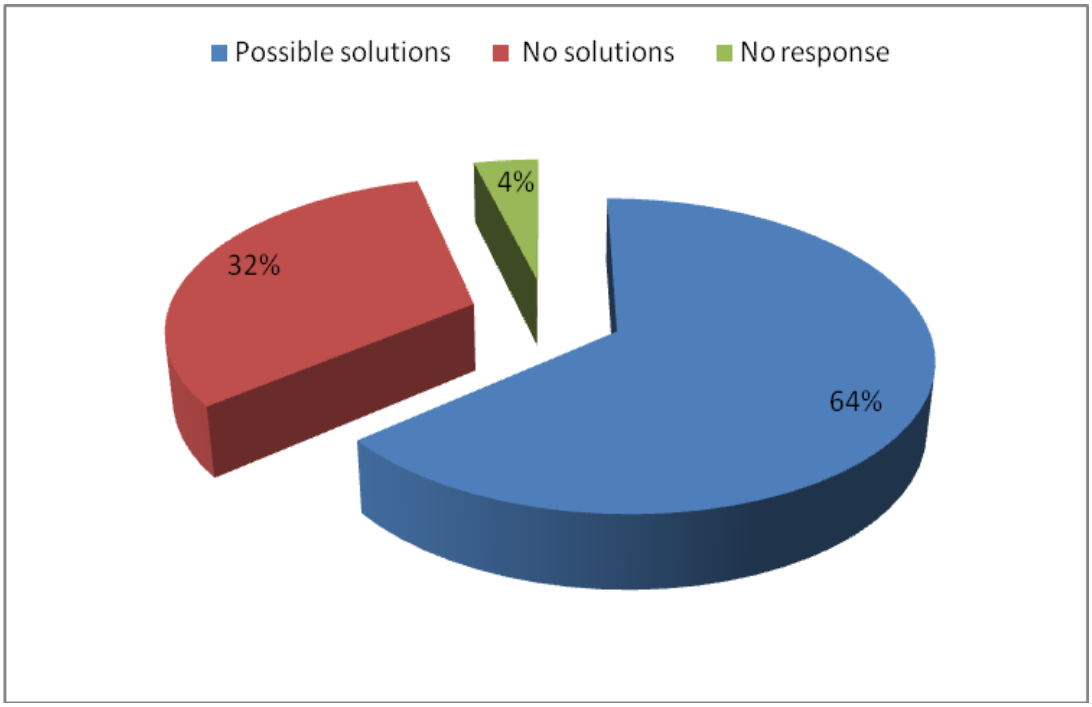


Figure 4.12: Current Possible Solutions
Source: Field Data (2019)

The findings in Figure 4.12 illustrates that there are some measures being taken to arrest the predicaments caused by tobacco production in Kasulu District and the country as a whole. This has manifested in their responses in Figure 4.12, 64% of respondents showed that the solutions are current there to address the setbacks caused by production of tobacco in the District. Meanwhile, 32% of respondents said that there is no any solution being done to eradicate the problem, and 4% of the respondent did not attempt the question. Likewise, the interviewees agreed that some measures are being undertaken, though it seems they are not really the effective one.

Figure 4.13: Forest Resource Management Strategy in Titye Village
Source: Field Data (2019)

The results above disclosed that in Kasulu District tobacco producers take some initiatives to eradicate the problems of tobacco production. The researcher asked the one of the interviewee to state what the measures are being taken; she was heard saying that they normally plant trees around their farms special for curing tobacco

leaves also they cultivate a food crop to make them survive instead of concentrating more in cash crops, also they had several seminars that prevent them from burning putting on the fire on the forests. Moreover, he wanted to know who conducted the said seminars. She added that the District and the tobacco companies were responsible in directing the informants what they have to do to rescue the situation. 4.13. Forest resource management strategy in Titye village.

Furthermore, the researcher heard some of the interviewees saying that the measures being taken are not enough to combat the environment, that is why the environment is still degraded and the tobacco is being produced. However, Rweyemamu and Kimaro (2006) observed why the measures being taken by the farmers in Kasulu District are or may not be productive when they assert that tobacco improves the living standards of the farmers as it attracts higher selling price. Additionally, Kuboja (2011) Virginia tobacco is financially rewarding and it is associated with high cost of production; it is said that Virginia tobacco is produced most entirely in Tanzania for export.

4.5.2 Respondents' Satisfactions on Forest Management Strategies

The researcher's interest was to know whether respondents were satisfied with the management strategies being taken by Kasulu District and the entire tobacco companies in combating the impact caused by producing tobacco in the District. A total of 109 of respondents answered the question, and Figure 4:12 summarises their responses.

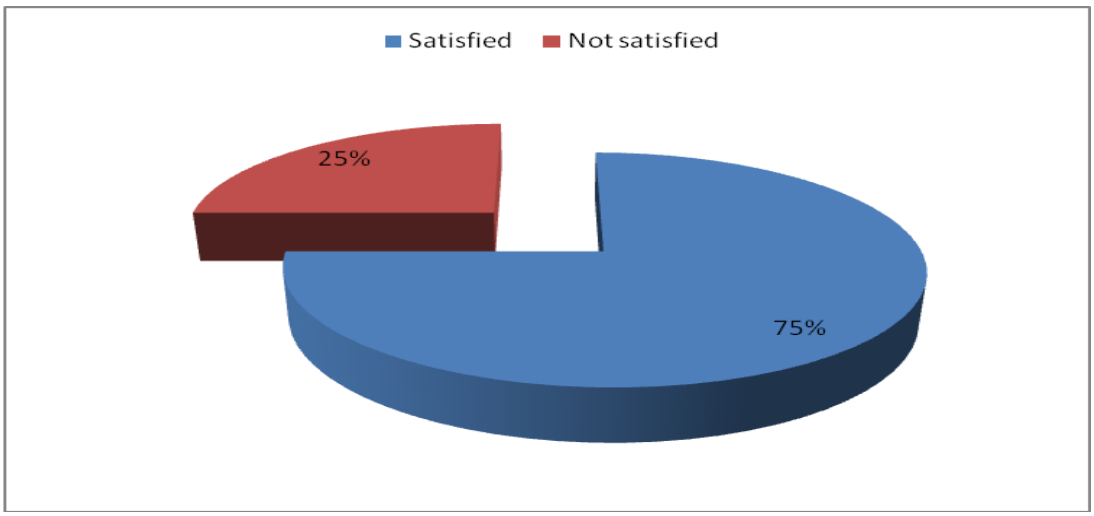


Figure 4.14: whether Informants are Satisfied on Forest Resources Management Source: Field Data (2019)

Figure 4.14 indicates that 75% of respondents attempted "Yes" that means they agree that they are satisfied with the management strategies being taken by Kasulu District, while 25% of participants were of the opinion that the measures being taken are not satisfactory, for the land is being deteriorated. Likewise, the interviewees were into sides some were satisfied while others were not satisfied. The results on Figure 4.14 disclose that most participants showed their satisfaction on the measures being taken to manage the forest resources.

Interestingly, data in the same Figure indicate dissatisfaction of the management strategies taken by the District and the tobacco companies. No wonder the majority agreed that they are satisfied as the respondent's education profile most of the tobacco producers are standard seven leavers; so, one may say it is their level of understanding. Whereas, the profile showed the educated persons who engage in tobacco production are fewer; at the same time, the interviewees were the expertise who were educated and fewer in numbers and are those who were not satisfied with the management strategies being taken.

When 75% of respondents asked to mention the management strategies taken; they just said they planted trees and they are now controlling people from putting on fire on the forests. With these strategies the interviewees added that more strategies are needed suggesting that there must be policies that prevent young people from smoking cigarettes. As David Casey, vice president of workforce strategies and chief diversity officer of CVS Health, has a message for stores that sell tobacco; "You're selling a product that is going to get rid of half of your consumer base." One of the interviewees suggested that;

> *"The government should promote economically alternatives to tobacco for farmers; to reduce the amount of land cultivated for tobacco leaf; and to protect the environment and health of farmers." She said. (25.3.2019)*

4.5.3 Respondents in Forest Resources Conservation Trainings

The researcher was also interested to know whether participants had the opportunity to attend trainings on how to preserve their forest resources. Thus, he posed the close-ended question asking the informants to stated the extent the Kasulu District provide them the training opportunities. Figure 4.15 illustrates their responses;

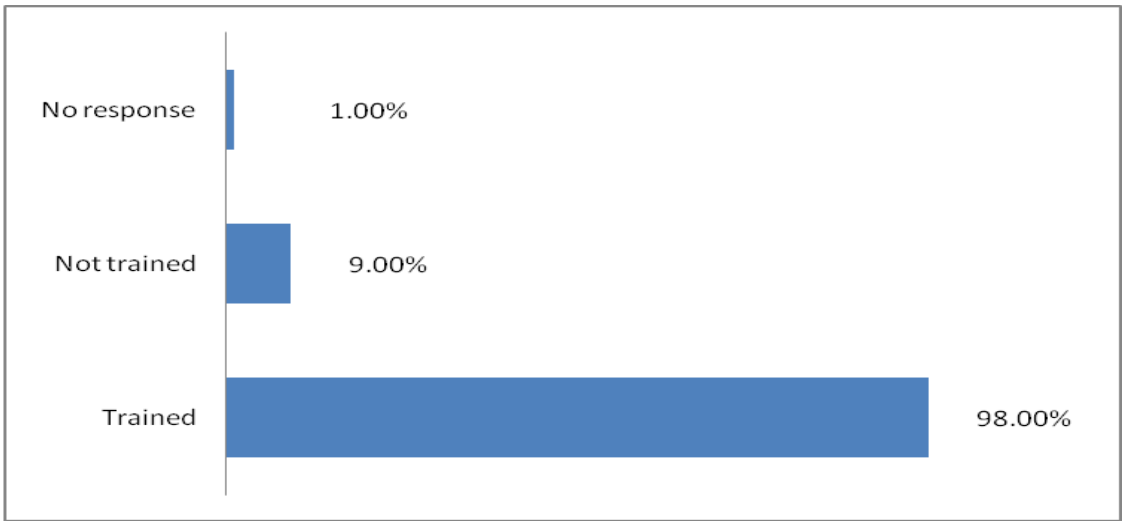


Figure 4.15: Whether Informants Attend Trainings
Source: Field Data (2019)

The results in Figure 4.15 indicates that 98.0% of respondents were of the views that Kasulu District in collaboration with tobacco companies have trained the respondents on how to preserve forest resources, while 9.0% of respondents asserted that they had no training opportunities. Moreover, most interviewees agreed that the District and tobacco companies have trained them on various topics with regards to tobacco production and environmental conservation. The findings in Figure 4.15 disclosed that at the District level the informants were trained on how to preserve the forest resources and therefore, one can say that participants are aware on how to preserve the forest reserves, even though few said that they have never attended any training. Figure 4.15 indicates that 98.0% of informants are aware of preserving the forest resources, but the forest resources are deteriorating and the environmental conservation is questionable. In response, the interviewee was heard saying that they experience deforestation because they are still producing tobacco; hence, they consume a lot of firewood leading to soil erosion, and deterioration of forest resources. Most importantly, she added that they cannot stop producing tobacco because;

> *"Tobacco farming generates earnings not only for the tobacco farmers, but also it promotes local economic development in their country." She asserted. (25.3.2019)*

In cooperating with the interviewee's idea above, Kafanabo (2008) observes that tobacco is one of the cash crops produced by most smallholder farmers in Tanzania. It improves the living standards of the farmers as it attracts a considerably higher selling price compared to other cash crops such as cotton. Likewise, most of the tobacco growing countries in Africa, according to Institute (1980) are among the world's poorest countries; thus, these countries view tobacco leaf export as an

important source of income and as a means to alleviate poverty. Moreover, tobacco expertise when asked he asserted that smallholder farmers in Kasulu District are aware that deforestation for tobacco growing has serious environmental costs such as loss of biodiversity, soil erosion and degradation, but tobacco keep farmers employed and earning them income.

4.5.4 Respondents' Suggestions on Forest Management Strategies

The open-ended question was posed to the informants requesting them to give out their opinions on what should be done to manage forest resources in Kasulu District. A total of 109 participants attempted the question, as Table 4:2 summarises their responses.

Table 4.2: Opinions on Management Strategies of Forest Resources

Responses	Frequency	Percentage
Tobacco companies must encourage trees plantation	16	14.5
Tobacco leaf companies should not set the price	39	35.4
There are must be free market	13	11.8
Children must not work in tobacco plantations	25	23.6
Leaf companies should restore/revive the land	16	14.5
Total	**109**	**99.8**

Source: Field Data (2019)

The results in Table 4:2 show the respondents propositions on the management strategies of forest resources strategies in Kasulu District. For instance, 35.40% of informants advised that Tobacco leaf companies should not set the price of leaf tobacco; instead it should be the government's responsibility through the responsible ministry. Why this suggestion? The researcher wanted to know; one of interviewees was quoted saying that the price farmers can get for their leaf tobacco is fixed on by the leaf companies, which grade the leaves and set the price, leaf tobacco farmers

find themselves trapped in a vicious cycle of poverty and indebtedness. She added that after paying their loans received from the leaf companies to buy inputs, farmers' income is often in the negative.

The results also disclosed that 23.60% participants were not happy to have their children work in tobacco farms, because children in tobacco farming put the children at risk for illness and commercial exploitation. Most interviewees were of the opinion that it does not make sense, while other children are in the classrooms studying; others are busy in the tobacco farms. One woman added that:

> *"We cannot shy away from the truth that our kids contribute the labour supply, and help us to boost up the family income, but they are at risk, they better study first and look for some money later." She said. (25.3.2019)*

Other participants wanted the District together with leaf tobacco producers to put on the ground the concrete of forest resources management strategies so that they can be able to preserve their land from sail degradation and erosion. For instance, they suggested the District authority and leaf companies to encourage indigenous to plant trees, whereas others suggested the leaf companies to support farmers with manure so that they may use it to restore/revive their land which is deteriorating because of clearing of land for tobacco production, as well as pollution of rivers and streams with agrochemicals such as pesticides and fertilizers that are used extensively.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study was set to assess the impacts of tobacco production on forest resources management in Kasulu District in Kigoma Region, Tanzania. The study was designed to meet the research objectives as stated in chapter one and the features of conceptual framework expressed in the same chapter. More importantly, the study had to answer the research questions, which developed from the research objectives mentioned in chapter one, as well. This chapter deals with the summary, conclusion, suggestions for further studies and the recommendations for the study.

5.2 Summary of the Study

The collected data in this study as presented, interpreted, analysed and discussed in chapter four were accumulated using the following techniques; questionnaires, interview and documentary review. These findings were guided by the specific research objectives that included; first, to examine the source of energy used in curing produced tobacco, second, to examine the impacts of tobacco production on deforestation and lastly, to examine the management strategies of forest resource in the tobacco production area in Kasulu District in Kigoma Region, Tanzania.

5.2.1 Source of Energy in Curing Tobacco

The results revealed that tobacco producers normally use firewood to cure tobacco. According to the findings, if this speed of firewood consumption persists, the district is led into fire wood calamity. Likewise, the collected data pointed that an average of 14 kg of fuel wood is consumed to obtain 1 kg of cured tobacco. The results also

suggested an alternative to be put in place, if the forest resources are to be preserved in Kasulu District.

5.2.2 Impacts of Tobacco on Deforestation

The findings revealed that most tobacco producers are aware that growing tobacco negatively impacts the environment in Kasulu District, and it is even worse, when the land covered is thousands of hectares. It includes the use of agrochemicals that degrade soil and soil fertility.

5.2.3 Management Strategies of Forest Resources

The findings revealed that most respondents are aware that Kasulu District in collaboration with tobacco companies had trained them on how to preserve forest resources; it is very unfortunate that they cannot stop from tobacco production, because it generates them earnings and promotes local economic development in their District. The data also portrayed that more strategies on the ground are needed to arrest the situation.

5.3 Conclusions

Basing on the discussions and the reviewed literature hereby are conclusions drawn from the study;

5.3.1 Source of Energy in Curing Tobacco

Tobacco farmers in Kasulu District make use of firewood as source of energy to cure tobacco, and it is very unfortunately that they have no other source of energy. This situation leads to have a larger area of forest cleared, as it was estimated 0.6

hectare of woodland have to be cleared to cure 1 hectare of tobacco, leading to deforestation rate of 13,000 hectares per annum. More importantly, it also seems that even if tobacco producers have been attended several seminars, they still utilise firewood to cure the produced tobacco. Thus, if this speed of firewood consumption as source of energy to cure tobacco persists, the District is led into calamity.

5.3.2 Impacts of Tobacco on Deforestation

Since tobacco is a remunerative cash crop, it attracts farmers in Kasulu District to clear more forests to reap more profits that farmers forsake planting subsistence crops, often risking earning money. It also gives the impression that there is a chain of environmental damage throughout the tobacco cycle, from growing, curing, manufacturing and distribution. Importantly, lack of crop substitution to enable farmers to break out of tobacco farming has led to negatively impacts of environment, for no replacement to the soil or to other parts of the farm ecosystem in the District; consequently, the tobacco industry damages the environment. Thus, there is a need of taking precaution if the forest resources are to be preserved in the District for the future generations.

5.3.3 Management Strategies of Forest Resources

Lack of knowledge and reliable forest resources management strategies on the ground; lead to most tobacco producers to ignorantly destruct forest resources, consequently, the loss of forest cover, due to tobacco curing in the District. This circumstance contributes to the negative impacts of forest resources management in Kasulu District.

5.4 Recommendations to the Study

From the discussions and the conclusion above the following measures are recommended to be undertaken so as to arrest the situation;

i. The study recommends the government, leaf tobacco companies, and the World Health Organization (WHO) to identified alternative crops that can give greater income to tobacco farmers in Kasulu District to enable them to break out of tobacco farming.

ii. The international tobacco control community, and international organizations such as the World Bank, can help in improving the health and farmers' livelihood by rendering them the knowledge and skills to try alternatives, by supporting and sponsoring crop substitution projects

iii. The study also recommends Kasulu District and leaf tobacco companies to provide training programs to help farmers acquire tobacco production skills such as forest resources and environmental conservation as well as forest resources management strategies which will help to conserve the environment and soil fertility.

iv. The research studies must be conducted to provide the empirical evidences that tobacco farming causes environmental degradation and perpetuates its exploitative nature. Given empirical evidence, the governments may come up with lasting solution that will be of advantages to farmers and the District.

v. The study also recommends the government to provide leaf tobacco producers with a supportive knowledge and skills. Tobacco farmers often are unaware of the environmental impacts of tobacco farming include

massive use of water and large-scale deforestation.

vi. The government should utilize the natural gas and try to cooperate with vocational technical colleges by financing them with capital, the colleges can be used to manufacture or produce tobacco curing leaves burners (Kiln) which can be supplied to small tobacco farmers in a form of loan, deforestation problem can be minimized.

vii. Tobacco companies in collaboration with the government should make effort to supply powerful solar energy to farmers as an alternative measure of curing tobacco leaves.

viii. Coal and electricity are required to be supplied to all villages which cultivate tobacco. Invention and creation of coal and electric simple tobacco burners are required to be introduced. This should be done by the Government and tobacco companies

5.5 Suggestions for Further Studies

While this study dealt with the impacts of tobacco production on forest resources management in Kasulu District;

i. The study did not work on the impacts of tobacco production on forest resources management at the Regional and zone levels, instead the study was confined itself in Kasulu District. Thus, further research is needed to expand it at the regional and zone levels, if it is to be more successful.

ii. This study dealt with impacts of tobacco production on forest resources management, thus, future research should consider examining other angles of tobacco production, because tobacco production is a significant issue that

bears further investigations.

iii. Finally, the restrictions of this study also support caution when interpreting the results and suggest further research. For instance, the small number of participants in the study, especially those dealt with in the pilot test and the District leaf tobacco producers remains a problem. Thus, additional research should be conducted to examine whether the researcher's results are supported in a larger sample and in different localities.

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APPENDENCES

APPENDIX I: RESEARCH INSTRUMENTS

INTRODUCTORY LETTER

Dear Participant,

My name is Fredrick Joseph Msigwa an Open University of Tanzania (OUT) student, Kigoma centre, undertaking a Masters course in Natural Resource Assessment and Management (MANRAM). For this moment, I am conducting a research on the Impacts of Tobacco Production and Management of Forest Resources in Kasulu District in Kigoma Region, Tanzania.

This questionnaire will have a remarkable importance because, if well attended, the questions will help to answer and solve the daily problems that are facing deforestation and disappearing of forest resources in our District.Thus, I would request you to read each item carefully, and answer each question you are provided with. You are also requested to put a mark (√) in the provided brackets and fill in the space provided as per instruction. Moreover, you are requested not to write down your name; assuring you that your answers will remain anonymous. All in all, your participation in this study is greatly appreciated.

Thank you in Advance

……

Fredrick Joseph Msigwa

(Student)

Appendix II: Questionnaire to the Tobacco Farmers

The purpose of this questionnaire is to find out the extent tobacco production may go hand in hand with the management of forest resources leading both the tobacco producer benefit from their activities at the same time the forest resources remain safe in Kasulu District. Thus, you are provided with the questions to answer, please read the instruction carefully and respond according to the instruction provided on each question. You are also requested to write in the space provided either by putting a mark (√) in the brackets or filling in the space provided.

SECTION ONE: PERSONAL DETAILS

1. Gender: (put a tick)

Female	Male

2. What is your age? (Put a tick)

18 - 25	26 – 35	36 - 45	46 – 55	56-65	66+

3. What is your educational level? (Put a tick)

Masters	Graduate	Diploma	Certificate	O level	Std vii	None

4. What is your marital status (Put tick)

Married	Unmarried	Divorced

SECTION ONE: Source of energy in curing produced tobacco

7. What is type of energy and how often do you use them to cure tobacco?

Very often	Often	No	Not at all

Why? .....

.....

8. What is your marital status? (Put tick)

Are you aware that when you use these sources of energy you destroy the forest resource? (Put a tick)

Yes ( )

No ( )

Where did you get the knowledge if you are aware?

.....

Why? .....

10. Is any other source you use apart from that one?

Yes ( )

No ( )

Mention them, please.

1. .....

2. .....

3. .....

4. .....

11. What is your opinion on the impacts of tobacco production and forest resources management?

SECTION TWO: Tobacco production and its impact on deforestation

1. How do you feel in producing in tobacco? (Tick)

Very satisfied	satisfied	Fair	unsatisfied	Very unsatisfied

If Yes why?

…….....……

If No why

.....……**.....**……

2. How many hectors do you own? (Tick)

1-3	4-6	7-10	More

3. How many tones of firewood do you use to cure your tobacco?

10-25	26-40	41-56	57+

5. What are your suggestions the impact of tobacco production on the deforestation?

.....

SECTION THREE: Management strategies of forest resources in the tobacco production area

1. Do you currently have possible solutions to eradicate problems caused by tobacco production? (Put a tick)

Yes ( )

No ( )

Why?

……

……..……

…

2. Are you satisfied with management of forest resources on the tobacco production? (Put a tick)

Yes ( )

No ( )

If Yes why? ……

…….

If No why .....……

…….

3. Have you attended any training on how to preserve the forest resources?

Yes ( )

No ( )

If Yes why? ……

If No why .....……

……

4. What is your suggestion on the management of forest resources?

……

THANK YOU IN ADVANCE

APPENDIX IV: SEMI-STRUCTURED INTERVIEW TO THE VILLAGE WARDS AGRICULTURAL EXTENSION OFFICERS.

The purpose of this semi-structured interview is to find out the extent tobacco production may go hand in hand with the management of forest resources leading both the tobacco producer benefit from their activities at the same time the forest resources remain safe in Kasulu District.

SECTION ONE: PERSONAL DETAILS

1. Gender: (put a tick)

Female	Male

2. What is your age? (Put a tick)

18 - 25	26 – 35	36 - 45	46 – 55	56-65	66+

3. What is your educational level? (Put a tick)

Masters	Undergraduate	Diploma	Certificate

4. What is your marital status? (Put tick)

Married	Unmarried	Divorced

SECTION ONE: Source of energy in curing produced tobacco

4. What are the sources of energy and how often do you use them to cure tobacco?
5. Are you aware that when you use these sources of energy you destroy the forest resource?
6. Is any other source you use apart from that one?

7. What is your opinion on the impacts of tobacco production and forest resources management?

SECTION TWO: Tobacco production and its impact on deforestation

1. How do you feel in producing in tobacco?
2. How many hectors do you own?
3. How many tones of firewood do you use to cure your tobacco?
4. What are your suggestions the impact of tobacco production on the deforestation?

SECTION THREE: Management strategies of forest resources in the tobacco production area

1. Do you plant trees?
2. Are you satisfied with management of forest resources on the tobacco production?
3. What are the procedures do you utilise to preserve the forest resources?
4. Have you attended any training on how to preserve the forest resources?
5. What is your suggestion on the management of forest resources?

THANK YOU IN ADVANCE

SEMI-STRUCTURED INTERVIEW TO VILLAGE CHAIRPERSONS

The purpose of this semi-structured interview is to find out the extent tobacco production may go hand in hand with the management of forest resources leading both the tobacco producer benefit from their activities at the same time the forest resources remain safe in Kasulu District.

SECTION ONE: PERSONAL DETAILS

8. Gender: (put a tick)

Female	Male

9. What is your age? (Put a tick)

18 - 25	26 – 35	36 - 45	46 – 55	56-65	66+

10. What is your educational level? (Put a tick)

Masters	Undergraduate	Diploma	Certificate

11. What is your marital status? (Put tick)

Married	Unmarried	Divorced

SECTION ONE: Source of energy in curing produced tobacco

12. What are the sources of energy and how often do you use them to cure tobacco?
13. Are you aware that when you use these sources of energy you destroy the

forest resource?

14. Is any other source you use apart from that one?
15. What is your opinion on the impacts of tobacco production and forest resources management?

SECTION TWO: Tobacco production and its impact on deforestation

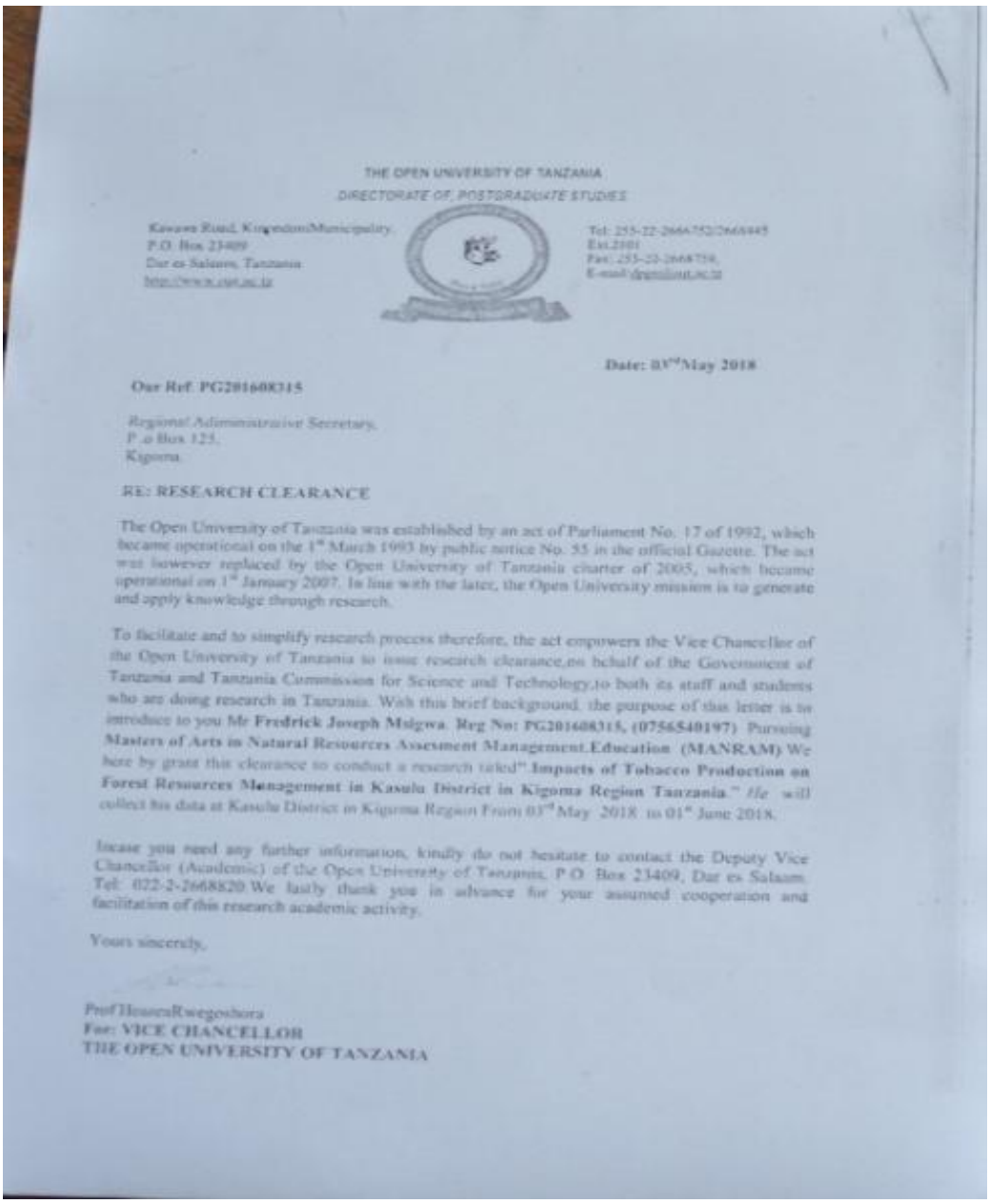
5. How do you feel in producing in tobacco?
6. How many hectors do you own?
7. How many tones of firewood do you use to cure your tobacco?
8. What are your suggestions the impact of tobacco production on the deforestation?

SECTION THREE: Management strategies of forest resources in the tobacco production area

6. Do you plant trees?
7. Are you satisfied with management of forest resources on the tobacco production?
8. What are the procedures do you utilise to preserve the forest resources?
9. Have you attended any training on how to preserve the forest resources?
10. What is your suggestion on the management of forest resources?

THANK YOU IN ADVANCE

Appendix v: Letters Clearance and Accpeptance



THE OPEN UNIVERSITY OF TANZANIA
DIRECTORATE OF POSTGRADUATE STUDIES

Kawawa Road, Kinondoni Municipality
P.O. Box 23409
Dar es Salaam, Tanzania
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Tel: 255-22-2668752/2668445
Ext.2101
Fax: 255-22-2668759,
E-mail: dpgs@out.ac.tz

Date: 03rd May 2018

Our Ref: PG201608315

Regional Administrative Secretary,
P .o Box 125,
Kigoma.

RE: RESEARCH CLEARANCE

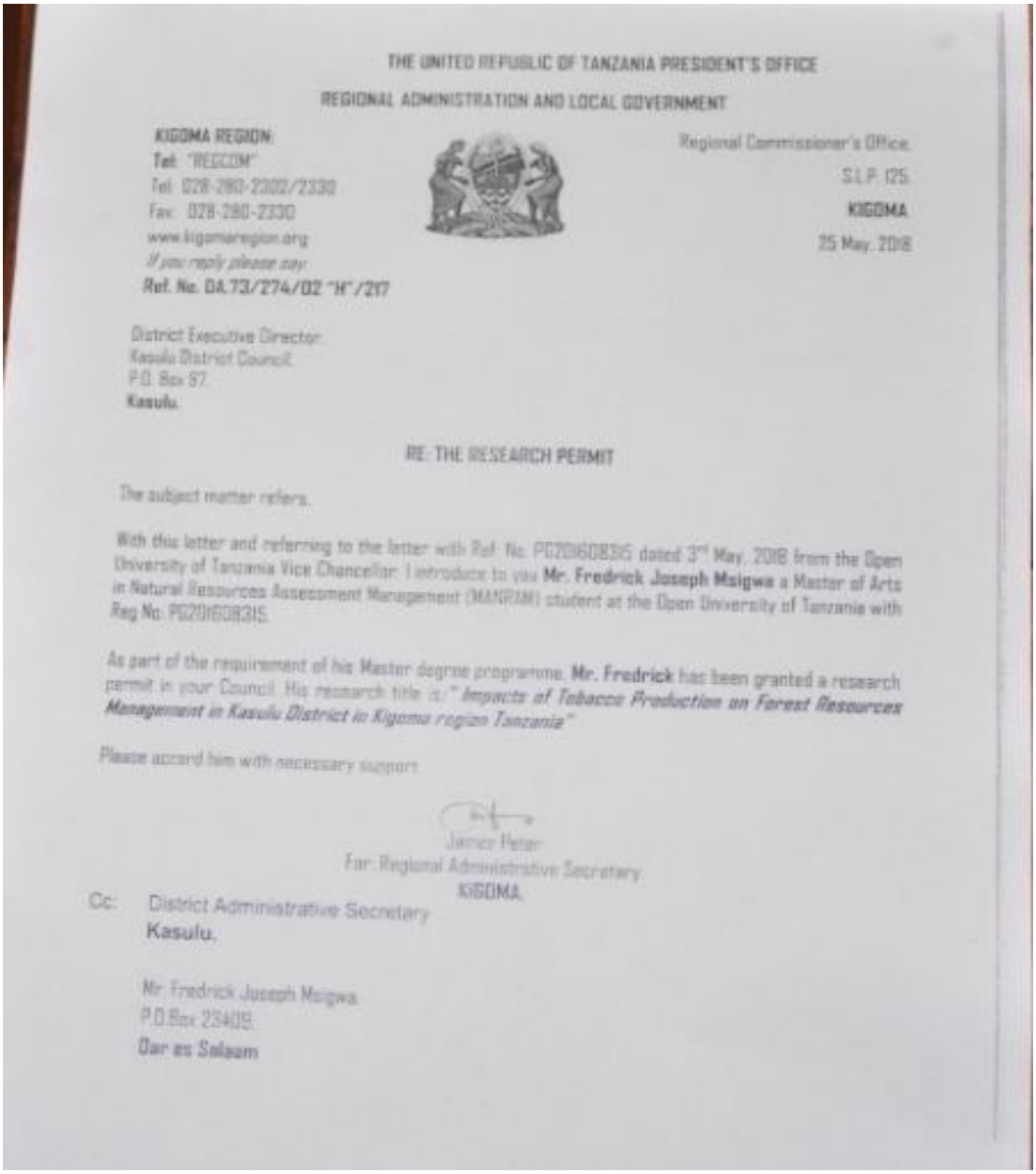
The Open University of Tanzania was established by an act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No. 55 in the official Gazette. The act was however replaced by the Open University of Tanzania charter of 2005, which became operational on 1st January 2007. In line with the later, the Open University mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance,on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology,to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you Mr **Fredrick Joseph Msigwa**, **Reg No: PG201608315, (0756540197)** Pursuing **Masters of Arts in Natural Resources Assesment Management.Education (MANRAM)** We here by grant this clearance to conduct a research titled"**Impacts of Tobacco Production on Forest Resources Management in Kasulu District in Kigoma Region Tanzania**." *He* will collect his data at Kasulu District in Kigoma Region From 03rd May 2018 to 01st June 2018.

Incase you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O. Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

Prof Hossea Rwegoshora
For: VICE CHANCELLOR
THE OPEN UNIVERSITY OF TANZANIA



THE UNITED REPUBLIC OF TANZANIA PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

KIGOMA REGION
Tel: "REGCOM"
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If you reply please say
Ref. No. DA.73/274/02 "H" /217

Regional Commissioner's Office
S.L.P. 125
KIGOMA
25 May, 2018

District Executive Director
Kasulu District Council
P.O. Box 97
Kasulu.

RE: THE RESEARCH PERMIT

The subject matter refers.

With this letter and referring to the letter with Ref. No. PG201603836 dated 3rd May, 2018 from the Open University of Tanzania Vice Chancellor, I introduce to you **Mr. Fredrick Joseph Msigwa** a Master of Arts in Natural Resources Assessment Management (MANRAM) student at the Open University of Tanzania with Reg No: PG201603815.

As part of the requirement of his Master degree programme, **Mr. Fredrick** has been granted a research permit in your Council. His research title is:" ***Impacts of Tobacco Production on Forest Resources Management in Kasulu District in Kigoma region Tanzania***"

Please accord him with necessary support.

Janice Peter
For: Regional Administrative Secretary
KIGOMA.

Cc: District Administrative Secretary
Kasulu.

Mr. Fredrick Joseph Msigwa
P.O.Box 23409
Dar es Salaam