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ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF TOBACCO FARMERS TOWARDS THE LEGISLATION THAT REQUIRES THEM TO ESTABLISH EUCALYPTUS WOODLOTS FOR TOBACCO CURING.

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APPROVAL FORM

The undersigned certifies that they have read, approved and recommended to Bindura University of Science Education for acceptance of this dissertation project entitled, "Assessment of knowledge, attitudes and practices (KAP) of tobacco farmers towards the legislation that requires them to establish eucalyptus woodlots for tobacco curing."

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DEDICATION

I dedicate this research to my family

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First and foremost, I would like to thank the Lord for His guidance. I would like to acknowledge the contribution of my academic supervisor for all the continued and unwavering assistance and support the he rendered. I equally extend my gratitude to all lecturers for their contribution in my intellectual grooming. I also acknowledge the contribution of officials from Mashonaland West Provincial Forestry Commission, Zvimba District AGRITEX office and Mashonaland West Provincial Environmental Management Agency for providing relevant information that was utilised in this research.

ABSTRACT

The study aims to assess the level of knowledge, attitude and practices (KAP) of people towards legislation that requires them to grow eucalyptus trees for purposes of tobacco curing. The study shall be carried out in the southern area of Zvimba District in Zimbabwe.

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KAP Knowledge, Attitudes and Practices

EMA Environmental Management Agency

CHAPTER ONE

1.1 INTRODUCTION

This research seeks to assess the knowledge, attitude and practices of Zimbabwean farmers towards the legislation that requires them to establish eucalyptus woodlots for tobacco curing operating at the small scale sector, large scale and communal sector with special focus on Zvimba South constituency's wards 20 and 23. The small scale sector refers to small farms that usually are not more than ten hectares of land mainly for crop production. Although they are not as advanced as large scale commercial (LSC) growers, most small scale commercial (SSC) farmers used to produce at a reasonably high level and enjoy good access to basic equipment Bishop et.al., (1985). Large scale farming system usually involves growing of crops and rearing of animals on large piece of land applying modern farming technologies, A.G Black 1981. Communal farming usually practiced in communal areas where by communal farmers run their holding as joint enterprise. In Zimbabwe most rural households may wish to establish Eucalyptus woodlot as a component of livelihood improvement and diversification to meet household wood demand and generating cash income. However, there is lack of information on the growth parameters of Eucalyptus woodlot and the factors influencing the household decision on their establishment at the individual farmland level. The objective of this study is to examine local people's knowledge, attitudes practices on the SI 116 of 2012 requiring them to establish Eucalyptus woodlots for tobacco curing in Zvimba South area. The forest depletion together with the sharply increasing human population, has resulted in a severe shortage of wood products especially for fuel wood (Ayele 2008, Liang et al 2016). This also has stemmed from the very strong dependence of wood products by the majority of the society as there is poor infrastructural development in the country (Hailu et al 2003)

1.2 BACKGROUND OF THE STUDY

The African region mostly depends on agriculture for food, employment and income generation in order to sustain itself. Agriculture is the backbone of most economies of the developing countries as it is the major source of revenue (Keyser, 2002). In the wake of increased environmental and sustainability concerns over heightened mechanisation in agricultural production, countries are faced with the dilemma of adequate, equitable and sustainable

resource allocation and use especially in agricultural sector. Short – run technological gains and long-run environmental conservation are the two choices concerned in sustainable development. These require the adoption of appropriate technology that would suit particular level of different global communities. There is need to optimize the use of scarce resources in the management of natural resources to obtain the best services from the environment. Agriculture and other economic activities are producing externalities that affect the environment such as deforestation, pollution and so on (Pearce and Brown, 1994).

According to the Agrarian Land Reform Programme of Zimbabwe which formally began with the land acquisition act of 2002, the land was redistributed from the white owned farms and estates to more than 150000 farmers under two models, the A1 and A2 model. The A1 allocated small plots for growing crops and grazing land and under A2 model the farms were distributed to new black commercial farms who has the skills and resources to farm profitably and raise agaric productivity, (Moyo 2011). The Zimbabwean economy heavily depends on agriculture, however most of the activities for example cash cropping like tobacco production seems to have impacts on the environment but the impacts are undermined or not considered. Smallholder farmers mainly use natural forest as the source of firewood for tobacco curing. They use natural forest because it is cheap to access and this lead to deforestation problems.

Deforestation is one of the major impacts caused by the production of tobacco (ITGA, 1996). It is therefore important to consider such impacts if tobacco production is to be sustainable. Most smallholder farmers are diversifying into tobacco production with the perception that the crop is profitable. This decision has led to an increased demand for natural forest as source firewood for tobacco curing due to an increase in the number of smallholder tobacco farmers. Tobacco leaf is cured using different sources of fuel. The sources of fuel include the following: coal, fossil fuels, electricity and natural forest. However, the majority of the Farmers use natural forest as the source of firewood as it is cheap and readily available resulting in deforestation.

Tobacco is a strategic crop in Zimbabwe as it provides employment, foreign currency and also improves the livelihoods of the farmers and the nation at large. Three main types of tobacco grown in Zimbabwe are Virginia (flue-cured), burley (air-cured) and oriental (sun cured)

tobacco. Of these, flue-cured is by far the most important and is generally produced in the better rainfall areas in natural regions II and III. Air-cured and sun-cured tobacco is predominantly smallholder crops though they are grown in the same natural regions with the flue-cured tobacco (Rukuni and Eicher, 1994). In contrast to sun-cured and air-cured tobacco, flue-cured tobacco was mainly grown by the Large Scale Commercial farmers (LSC). In Zimbabwe there are three groups of farmers involved in tobacco production namely, small-scale commercial (SSC) and smallholder (communal and resettlement). Although not as advanced as LSC growers, most SSC farmers used to produce at a reasonably high level and enjoy good access to basic equipment Bishop et.al., (1985).

Forests play major role in the preservation of biodiversity, conservation of soil and water and mitigation of climate change. In addition, millions of people globally obtain their livelihood from the use of forest (Dixon et al.1994), Bishaw 2001, Wofsy et al 1993). Nonetheless the world forest cover has been declining largely due to land use change and increasing demand for wood and non-wood products. Accordingly, about 13 million hectares of forests each year over the last ten years were converted mainly to agriculture land in the tropics (FAO 2010)

The amount of forest products that can be sustainably produced in natural forests is unlikely to meet future demands, and this will negatively affect conservation of the remaining forests. Unless alternatives are sought for the dwindling natural forests, in Ethiopia, it is not possible to meet the energy need in the country in which over 90% is derived from wood. As a response farmers are required by SI116 to intensively plant fast growing trees such as eucalyptus

The adoption of the requirement by law to establish Eucalyptus woodlots for curing is likely to be affected by the farmer's knowledge and attitudes. This study therefore seeks to carry out a study into tobacco farmer's knowledge attitude and practices concerning the establishment of eucalyptus woodlots for tobacco curing.

1.4 PROBLEM STATEMENT

Despite the introduction of SI116 of 2012, requiring tobacco farmers to establish woodlots for tobacco curing, deforestation is still one of the environmental problems in areas where tobacco production by small-scale farmers is practiced. Most of the farmers especially small-scale

farmers and communal, tend to use indigenous forest for tobacco curing. In most cases, this may be due to the idea that people are unaware of the legislation that requires them to establish eucalyptus woodlots for tobacco curing. More so in most cases some of the farmers have the knowledge about the legal requirements but they have a positive attitude that influences them for example, some have the belief that the time taken by eucalyptus to reach maturity is large therefore not worth waiting for.

1.5 RESEARCH OBJECTIVES

1.5.1 MAIN OBJECTIVES

To assess the Knowledge, Attitudes and Practices (KAP) of tobacco farmers towards the legislation that requires them to establish eucalyptus woodlots for tobacco curing.

1.5.2 SPECIFIC OBJECTIVES

- ✓ To determine the extent of knowledge that farmers have on the legislation that requires them to grow eucalyptus species for tobacco curing.
- ✓ To evaluate the farmer's attitude towards the legislation that requires them to grow eucalyptus species for tobacco curing.
- ✓ To determine the practices of farmers with regards to the legislation requires them to grow eucalyptus species for tobacco curing.

1.6 RESEARCH QUESTIONS

1.6.1 MAIN QUESTION

What are the levels of Knowledge, Attitude and Practices related to legislation at small scale level?

1.6.2 SPECIFIC QUESTIONS

1. What knowledge do farmers have with regards to the legislation requiring them to grow eucalyptus species for tobacco curing?
2. What is the general attitude that farmers have towards the legislation requiring them to grow eucalyptus species for tobacco curing?

3. What are farmers practices that farmer's do in relation to the legislation requiring them to grow eucalyptus for tobacco curing.

1.7 JUSTIFICATION OF THE STUDY

The results for this study will pave way for an advanced environmental protection at local and national level in a bid to reduce the problems of cutting down of indigenous trees as fuel wood for tobacco curing. There will be an increase in the awareness of people on the importance of establishing plantations. This will be achieved through improving the understanding of KAP related to the establishment plantations at household level in small scale farms. In this case, the results obtained from this study will help advice farmers especially small scale farmers and how to protect the environment due to the use of fast growing trees for tobacco curing.

By assessing the effectiveness of the legislation, strategies that are implemented in the study seeks to identify the main gapes in the implementation and how best to find solution to counteract the challenges. It is of great hope that the result will be of great use to policy formulators, implementers, donors, curriculum developers and other service providers.

1.8 Scope

This study will mainly focus on the KAP related to the legislation that requires tobacco farmers to establish eucalyptus plantations for tobacco curing and the management strategies implemented

1.9 Assumptions

The researcher assumes that the respondents are honest and free from any influence when they answer the various questions. The researcher also assumes that gender does not affect the way people view things.

1.10 Definition of terms

Legislation

Refers to a statutory law which has been enacted by a legislature or other governing body . Before an item of legislation becomes law it may be known as legislation. Legislation can have many purposes: to regulate, to authorize, to outlaw, and to provide (funds), to sanction, to grant, to declare or to restrict.

A KAP survey usually is conducted to collect information on the knowledge (i.e., what is Known), Attitudes (i.e., what is thought), and Practices (i.e., what is done).

KNOWLEDGE is a fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information (Davenport and Prusak, 1998).

ATTITUDE can be defined as an enduring organization of motivational, emotional, perceptual and cognitive processes with respect to some aspect of the individual's world" Krech and Crutchfield (1948). These definitions emphasized the enduring nature of attitudes and their close relationship to individuals' behaviour. Some sociologists for example, (Fuson, 1942) and psychologists like, (Campbell, 1950), even defined attitudes simply in terms of the probability that a person will show a specified behaviour in a specified situation.

PRACTICE is the actual application or use of an idea, belief, or method, as opposed to theories relating to it.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

This chapter describes the assessment and theoretical framework employed in understanding the farmers' practices, knowledge and attitude towards the legislation requiring them to do eucalyptus plantations**.** It reviews existing information on KAP related to the Forestry legislation and the establishment of plantation of eucalyptus for tobacco curing in developing countries. A literature review aim is to demonstrate familiarity with the existing knowledge and establish credibility in the process. While in another instance, reviewing literature helps to place a research project in context thereby demonstrating its relevance (Neuman, 20011). The study presented will give an overall historical perspective on the study of the legislation that requires people to do eucalyptus plantations. Therefore, this review will look at the KAP related to the Forest Legislation, the establishment of eucalyptus plantations and the importance of their use in tobacco curing.

2.1 Forestry laws in Zimbabwe

2.1.1 Communal Land Forest Produce Act Chapter 19:04

In this ACT, it regulates the exploitation of and to protect forest produce within Communal Land; to regulate and encourage the establishment of plantations within Communal Land; and to provide for matters connected with or incidental to the foregoing. This means an agreement entered into in terms of section six for the exploitation of any forest produce; "authority" An agreement, licence, permit, special licence or special permit entered into or issued, as the case may be, in terms of this Act;

Under this act there is the encouragement to establish plantations. With the approval of the Minister to whom the administration of the Communal Land Act [Chapter 20:04], has been assigned, a local authority may establish and control plantations, forest nurseries connected with forestry on public land controlled by it. The Forestry Commission may establish and control plantations, forest nurseries that are necessary for its operations in Communal Land that include, on public land in accordance with the terms and conditions of a permit issued to

it by a local authority in terms of section 9 of the Communal Land Act [Chapter 20:04], or on land set aside in terms of section 10 of the Communal Land Act [Chapter 20:04], where the establishment of such plantations, forest nurseries is consistent with the purposes for which the land was set aside or with the terms and conditions of any lease of such land. With the approval of any local authority established for the area concerned, an inhabitant or association or group of inhabitants may establish and control plantations or forest nurseries connected with forestry on any land which the inhabitant, association or group, as the case may be, is entitled to occupy and use in terms of the Communal Land Act [Chapter 20:04], Nothing in this section shall derogate from any power vested in any person by any other law to establish and control plantations, forest nurseries and buildings or works connected with forestry in Communal Land.

2.1.2Forest Act Chapter 19:05

An Act to establish a commission for the administration, control and management of State forests, to provide for the transfer of certain assets belonging to the Government to the said Commission; to provide for the setting aside of State forests and for the protection of private forests, trees and forest produce. It regulates all demarcated forests, nature reserves, and private protected forests, reserved and protected trees such as timber reserves.

In this case Owner or occupier of private land shall give notice of intention to dispose of indigenous timber .Any owner or occupier of private land who desires to cut or remove indigenous timber on that land for sale or for use in the manufacture of any product or who enters into any agreement for the cutting or removal of indigenous timber on that land shall, not less than fourteen days before any such timber is cut or removed, give written notice thereof in accordance with subsection (2) to the Commission which shall, before the expiration of the stated period, cause the Minister and such other persons as the Minister may specify to be informed, in writing, of the contents of such notice.

2.1.3 The Statutory Instrument (SI 116 of 2012)

It states that no person shall sell or trade in any firewood except under the terms of a firewood trader's licence obtained in every district where he or she proposes to operate (unless he or she obtains his or her firewood exclusively from any firewood plantation in which event the person

is only required to obtain a firewood trader's licence in the district where the firewood plantation is located, or if there are two or more such plantations in two or more districts, in whichever district the person chooses to obtain a licence). More so, no person shall sell or trade in any timber except under the terms of a timber trader's licence obtained in every district where he or she proposes to operate

It also states that a flue- or flame-cured tobacco farmer must apply for a flue- or flame curing firewood licence, if he or she does not obtain firewood for curing of tobacco from a licensed firewood trader or does not grow a tobacco farm woodlot or does not use a common tobacco farm woodlot maintained according to the specifications in this section or does not exclusively use coal or fuel other than firewood to flue- or flame-cure his or her tobacco.

A flue- or flame-cured tobacco farmer according the SI 116 of 2012 shall not be required to obtain a flue- or flame-cured tobacco licence if he establishes a tobacco farm woodlot complying with the following specifications that is, the woodlot must consist of a plantation of fast growing trees (that is trees whose wood can be sustainably harvested for firewood in five to ten years from the date of establishment of the woodlot); and the woodlot must be planted over a period of five to seven consecutive years at a minimum rate of 0.3ha (550 to 850 trees at a spacing of 2m x 2m) for every one ha of tobacco grown; and the woodlot is either being harvested or not less than five years of age and in course for harvesting within the next two years.

2.2 Forestry laws in Eastern and Southern Africa

As the twentieth century drew to a close, many States in eastern and southern Africa had acknowledged shortcomings in their policies for forest management and had begun to implement new national forest policies and to enact new forest laws. The changes amount to a significant wave of reform. South Africa, Lesotho, Mozambique, Zanzibar (United Republic of Tanzania), Zambia and Malawi have promulgated new forest acts since 1997. Kenya, mainland Tanzania and Namibia have new forest laws in draft. Ethiopia, Swaziland and Uganda are finalizing national forestry policies and intend to follow them with new legislation (L.W Aiden 2000)

These laws focus on the encouragement of the involvement of people who live within or adjacent to natural forest in determining the future of forestry. These forestry communities are usually rural, poor and dependent mostly on forestry predominantly woodland dominated by miombo type which may be integral to their agricultural or pastoral livelihood.

Forest policy-makers have begun to express doubts about State ownership of valuable forest lands, partly because of the recognition that many States have failed to protect the forests under their ownership and jurisdiction. State forest tenure has often been realized as virtual open access, and devolving public ownership to more local and more narrowly defined agencies may provide better management and greater accountability. Ownership provides a secure foundation for management regimes which is not easy to obtain where management responsibility is premised on a potentially transient set of access rights or a share in forest benefits. The act of protecting the forest by setting aside as a forest reserve remains strikingly intact in the new laws. Irrespective of who creates or owns the reserve (Mbaya 2000).

In most of the African countries, many of the new laws provide of the removal of the forestry from the owners that fail to sustain this commitment. In terms of core authority over forestry maters, some shifts were being seen towards more public involvement. Many of the new laws enhance the opportunities for privatisation of commercial plantations forest estates through direct sale or concessions.

In Lesotho, the National Forestry Policy, 1997, and the Forestry Act, 1998, has the divestment of State Forest Reserves and plantations to the local level. The Forestry Act states that after consulting with the appropriate local authority, the Chief Forestry Officer “shall advise the Minister on the transfer of ownership, control and management of any forest reserve to individuals, groups of individuals, communities, organizations or cooperatives”. Transfer will be embodied in a written agreement binding on both the parties and shall provide that the Minister shall have a right to reclaim the forest reserve if the said agreement is breached materially (A. willy and Mbaya 200)

In South Africa the key thrusts of the National Forest Policy, 1996, and the National Forests Act, 1998, are towards the privatization of commercial plantation estates and towards

community involvement in relation to the remainder of reserved and unreserved estates (McIntosh et al., 1999).

However, the policy has the agreement that the community may return the lease of the plantation back to the state or the private sector to manage if the community fails

It was found that most of the subsistence needs for wood products for both urban and rural households has been obtained from eucalyptus. The species preference rank indicates that eucalyptus is the first preferably selected species by farmers as it has been accounting more than 28% of the income for rural households. Opinions from different stakeholders on eucalyptus revealed that, urban dwellers and farmers have the highest support for eucalyptus planting; the policy makers comparatively have the highest oppositions and researchers show the highest reservations. It is also found that eucalyptus has been contributing 86.2%, 31.4%, 100% and 100% for urban consumption of firewood, charcoal, leaves and poles respectively. The wood inflow and the wood carriers' frequency study have showed also that 74.32% of the wood inflow to Huruta town was from eucalyptus and 79.2% of the wood carriers are carrying eucalyptus (Zenebe Makonnen 2006). This implies how eucalyptus could contribute in the reduction of deforestation. Farmers expressed that the main constraints regarding eucalypt tree planting were biophysical, institutional, technical and policy factors. Regardless of the problems it has been observed that farmers plant eucalyptus in degraded areas, homesteads, borders, riverbanks, etc. which cannot be considered as inappropriate places for the species

2.3 Farmer's knowledge on the SI 116 of 2012

Farming sectors encompasses all walks of life with different backgrounds, the activities ranges from livestock to crop production. Most of the farmers acquire their knowledge through formal training either from contractors or from donors. Others leaned through apprenticing from more developed or experienced farmers. The level of knowledge on the legislation to farmers differs from place to place and through individuals. The differences in the level of education, lack of awareness and training affect the extent of farmer's knowledge on the legislation. In this case those that received formal training may have more knowledge than others as they had covered most of the needs through training. However, those that acquire knowledge through experience or more educated farmers, may only have the knowledge that they had learned from mistakes.

In Zimbabwe some of the factors that affect the knowledge of most of the farmers is the remoteness of the areas. Some of the areas are inaccessible to the extent that they will end up failing to receive the some of the important trainings. However, this can also affect the scope of their knowledge. However, despites these challenges they are some of the methods that they use to acquire knowledge for example social media, television and so on.

2.4 Farmers attitudes towards the SI 116 0f 2012

In Zimbabwe most of the farmers are small scale sectors, mostly their farms ranges from six to ten hectare with sometimes two to three hectares of cash crops like tobacco. Most of their reason for farming is for family consumptions. Therefore, making it difficult for them to engage in activities that may take much of their time or drain their savings. In this case most of the plantations by these farmers will likely to be small and manageable. In Indonesia small scale farm forest plantations have been practiced since the 1970s and is believed to be widely successful than individual plantation forest carried out on large scale state Nawir, et, al 2007

Most of the farmers believe that most legislations are implemented by the government or the state, therefore following the legislation is more like corroborating with the state. In most cases most of the programmes that in involves the state and the people usually fails as there will be no clear management and ownership. In Ethiopia the government supported peasant forest based on community ownership but these plantations deteriorated over time as they were no proper management plans and the relationship between communities and the state in managing or owning these plantations remained unclear Abebe 1998

2.5 Farmers practices on the SI 116 of 2012

Some of the activities by farmers may sometimes be unsafe to the environment despite their level of knowledge. Most of the farmers cut down trees for tobacco curing knowing that there is need to establish plantation of fast growing trees to be used in tobacco curing.

2.6 Eucalyptus woodlots in Africa

Planting of eucalyptus trees started in Ethiopia in the early part of the twentieth century, farmers and forestry personnel told that private farm tree planting in Ethiopia is relatively a recent phenomenon that gradually expanded as part of the afforestation campaigns of the 1970s and the 1980s (EFAP 1994; Ayele 2008; Negasa et al. 2016). Presently, private farm trees, nearly all Eucalyptus woodlots, are planted mostly on hilly patches, parts of farmlands that are not suitable for growing food crops, and around homesteads (Ayele 2008; Gemechu 2010; Negasa et al. 2016; Negasa et al. 2017a). However, common problems facing with Eucalyptus management in Ethiopia include termite and frost damages, fire, illegal tree cutting, and animal trampling of seedlings, mainly at establishment stages (EFAP 1994; Hailu 2002; Hailu et al. 2003; Ayele 2008)

The other fact is that economic poverty is one of the rampant problems in the most areas (Ayele 2008). Although the respondents know much about the adverse impacts of Eucalyptus resulted from their long history of settlement in the study site, they may develop positive attitudes towards growing Eucalyptus woodlot because they expect that growing Eucalyptus woodlot contributes much to improve and diversify their livelihood and cash income through the sale of Eucalyptus wood products (e.g., Hailu 2002; Bernard and Jurgen 2005;Ayele 2008;Lal 2008;Gemechu 2010; Kebebew and Ayele 2010; Bekele 2015;Negasa et al. 2016). The result further revealed that landholding size was positively correlated with local people's attitudes towards growing Eucalyptus woodlot.

Eucalyptus, the most planted tree in the world, has been grown in east Africa for over a century. Through this time, people in the region have accumulated important local knowledge of its management. Expanded widely, today this tree dominates rural and urban landscapes. For smallholder growers, eucalyptus suits their limited resources and yields more money than other tree crops. On top of this, the increasing demand for fuel wood and construction material has created a dependable market for eucalyptus products. This certainly contributes to the steady expansion of eucalyptus in the region.

Studies conducted in East Africa and elsewhere show that eucalyptus is among the most preferred trees, as it grows fast and survives in marginal environments. However, since its introduction, eucalyptus has been marred by controversies, surrounding its alleged negative environmental impacts and inability to provide the necessary productive and ecological services. As a result, scepticism prevented its promotion and in some drastic measures, planting was banned altogether. Among the concerns are that eucalypts may not adequately benefit mankind as forests, as they may not always provide quality wood, watershed and soil conservation, wildlife habitat and even recreational or aesthetic values.

Concerns about negative impacts of eucalypts on the environment have raised worries about planting the species. These worries resulted in banning eucalyptus planting on farmlands, stream banks and catchments areas. In 1913, not long after its introduction to Ethiopia, a directive was issued ordering the people of Addis Ababa to uproot half of the eucalyptus planted in the town (John Edy 2001). Similar concerns and proposed actions are still considered in Rwanda, Kenya, and Uganda (Jagger and Pender 2000; Nduwamung et al.2007; SPGS; Oballa et al. 2005).

The alleged negative environmental impact of eucalyptus is a global narrative. In this connection, FAO tries to provide unbiased views by commissioning several global, regional and country level studies (Davidson 1985; FAO 1988). The narrative seems to have three proponents- eucalyptus growers, environmentalists and researchers. Eucalyptus growers obviously support planting it, while environmentalists backed by agriculturists emphasize the negative impact. The third category, researchers, argues for a cautious and fair evaluation of pros and cons.

Major arguments against eucalypts include: they drain water resources; they enhance soil erosion; they suppress undergrowth; they deplete soil nutrients; they induce allelophatic effects (Davidson 1985; FAO 1988; Demel 2000; Amare 2002; Nduwamung et al. 2007). Major arguments supporting eucalyptus planting include: they are a fast growing tree; they require minimum care; they grow in wide ecological zones and poor environments; they coppice after harvest; they are resistant to environmental stress and diseases; their seeds are easy to collect,

store and no pre sowing treatment is required (FAO 1979; Zerfu 2002; Mekonnen et al. 2007; Nduwamung et al. 2007).

2.7 Common names of the eucalypts

The common names of the eucalypts in Australia probably run into thousands, since any one species may have several common names, especially if it has a wide natural distribution. As a whole group the eucalypts are known as gums, but the name gum is usually reserved for those species that have a smooth bark (wrongly called gum).

In southern Africa the widespread use of the name blue gum (or blue gum) for all eucalypts probably dates back to the first introduction of eucalypts into South Africa in 1828. The species was E. globulus, and it came in under the common name blue gum, although in Australia it is better known as Tasmanian blue gum or southern blue gum. By the turn of the century this species was being widely planted in the Cape Province and Natal, and the name blue gum must have been firmly fixed. Another blue gum was introduced into South Africa towards the end of the last century, which would have further entrenched the use of the common name: this was the Sydney blue gum, E. saligna. In actual fact the seed that had been imported was a mixture of Sydney blue gum and flooded gum, E. grandis, mostly the latter, but at that time Australian botanists did not recognize E. grandis as a distinct species.

E. grandis was introduced into Zimbabwe as E. saligna in 1892, and the common name blue gum came with it. Although conditions here are very suitable for true E. saligna, little has been planted in the country other than in research trials. The other blue gum, E. globulus, has not done well in our summer-rainfall climate, and hardly any of it has survived outside of the Nyanga National Park. The name blue gum, therefore, has practically no validity in Zimbabwe, but it is widely and indiscriminately used for any eucalypt.

CHAPTER 3: METHODOLOGY

3.1 Study Area Description

The research study was carried out in Zvimba district wards 20 and 23. Zvimba district is located in Mashonaland West Province in central northern Zimbabwe. Its main town is Murombedzi which is located 106 kilometres west of Harare by road. The district is primarily a farming and ranching district where such crops grown include tobacco, maize and cotton. Cattle are reared for dairy and beef produce. According to the 2012 census the population in the district was 245 489.

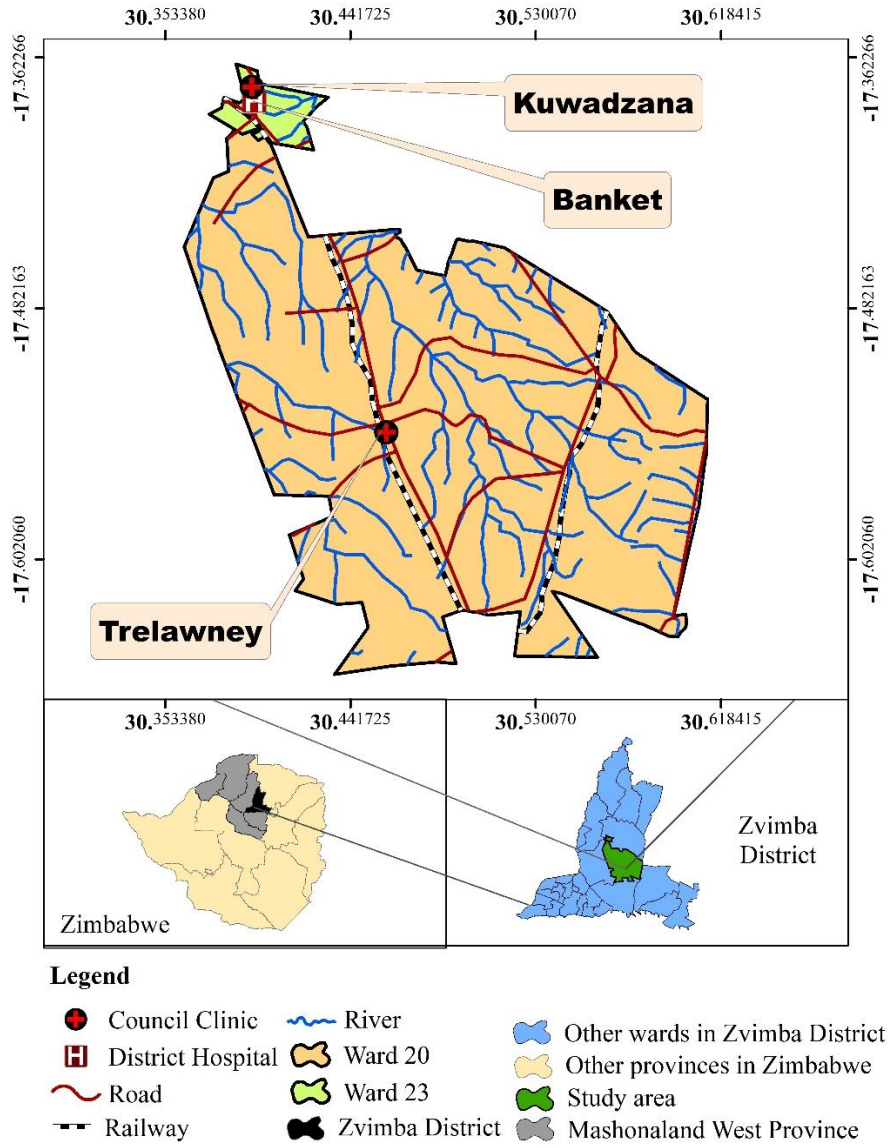

Figure 3.1: Map showing location of the study area in Zvimba District of Zimbabwe.

3.2 Research design

Research design refers to the overall strategy that one chooses to integrate the different components of the study in a coherent and logical way thereby ensuring one will effectively address the research problem and also generate evidence that respond to the research population (Langen, 2009). The research adopted the Descriptive research design. Descriptive research design utilizes both qualitative and quantitative approaches in the same study and is used to obtain information concerning the current status of the phenomenon (Lenth, 2001). Descriptive research was adopted in this research because it involves gathering data that describes events and then organises, tabulates, depicts and describes the data collected and often uses visuals such as graphs and charts (Pandey, 2003).

Quantitative and qualitative approaches were carried out to assess the knowledge, attitude and practices among farmers doing their farming activities in Zvimba district with regard to the SI 116 of 2012. The qualitative approach employed includes interviews, field observations, open ended questionnaires and secondary data sources. The main purpose for applying this method was to have an appreciation of people's knowledge, attitude and practices with regard to eucalyptus production for tobacco caring. Quantitative research design involved precise measurements and statistical analysis using Microsoft Excel. The researcher used both qualitative and quantitative research design because the two perfectly complement each other in fulfilling the goal of research.

3.3 Target population

Target population is a group of individuals who have one or more characteristics in common which are of interest to the researcher (Castillo, 2009). Zvimba area is made up of a cluster of farming activities ranging from crop production to livestock management falling under small and large-scale farming and communal. For the purpose of the study, the researcher targeted group of all farmers (small, communal and large farmers) who seem to be well versed and specialized in tobacco farming. A total of 93 tobacco farmers from ward 23 and 20 were targeted in this study. Key informants from the Department of Agritex, Ward Councillors, District Development Coordinator and ward Chairpersons provided data for this study.

3.4 Sampling

Sampling is selecting a portion of a large population but displaying characteristics that are representative of the entire population and be able to provide statistical valid inferences and this is called a sample (Trachoma, 2006). A sample refers to a subset of individuals in a population and it constitutes a representative of a population mainly expressed as a percentage, (Bret, 2011).

3.4.1 Sample size determination

Sample size determination is often an important step in planning (Lenth 2001). According to Cohen et al (2007), the correct size of a sample is rather determined by the purpose and nature of the population under study. Saturation sampling was adopted to select all 93 tobacco farmers in ward 23 and 20 of Zvimba District. It was adopted because the total population was manageable for the purpose of this study. To identify tobacco farmers present in each ward, the researcher used the snowball sampling technique. Snowball sampling is a technique by which respondents are recruited for interviews by means of informal contact between them (Driscol, 2011). The technique ensures that, one successfully recruited respondent will suggest others known to be eligible.

The researcher also used purposive sampling technique to select interview respondents. Purposive sampling was adopted because it is the most time effective sampling technique in which the researcher relies on his judgement when choosing members of the population to participate in the study (Black, 2010). This technique was used to select 6 key informants each from the Department of AGRITEX, District Development Coordinator's Office, Ward Chairpersons for ward 23 and 20 and ward Councillor for wards 23 and 20.

3.5 Research techniques

Research techniques are various methods and ways that are used for conducting a research. Kothari (2004) defined research methods as methods a researcher uses to perform research operations. In this research both primary and secondary data collection methods were used.

3.5.1 Questionnaire

Questionnaires are forms which are completed and returned by respondents and are an inexpensive method that is useful where literacy rates are high and respondents are cooperative (FAO 1997). The researcher used questionnaires to gather information on attitudes, perceptions of farmers on growing of eucalyptus for tobacco caring in Zvimba District. Each questionnaire contained both closed and open ended questions. Open ended questions were used because they gave respondents opportunity to express their knowledge in regards to growing of eucalyptus trees for tobacco caring. The questionnaire was structured according to the research objectives to fulfil the research goal for this study. A total of 93 questionnaires were distributed to selected tobacco farmers in wards 20 and 23.

3.5.2 Interviews.

Interviews can be used to find out what is on the mind of someone and how someone feels about a particular subject (Jerry and Marcin 2007). Interviews are very effective as a method of gathering data because they are flexible and adaptable. The researcher applied the structured interview approach. The researcher conducted interviews with purposively selected key informant interviews guided by an interview guide constructed according to research questions.

Table 3.1 Interviewees and the rationale for selecting them

Department	Interviewee	Rationale for interview
District Development Coordinator's Office	District Development Coordinator	✓ To gather information on farmers perceptions on tobacco caring ✓ To gather information on the extent of farmers knowledge on legislations
Department of AGRITEX	District Head	✓ To gather information on practices of farmers with regard to tobacco caring ✓ To gather information on farmers attitude on tobacco caring
Rural District Council	Ward Councillors for ward 23 and 20.	✓ To obtain information on farmers attitude ✓ To evaluate farmers practices on tobacco keeping
Ward Representatives	Ward Chairperson for ward 23 and 20	✓ To evaluate farmers practices on tobacco caring ✓ To assess farmers knowledge on growing eucalyptus for keeping tobacco

3.5.3 Observations

According to Baker (2006) observation is a systematic recording of observable phenomena or behaviour in a natural setting. Observations have the advantage of giving the researcher the opportunity to interact with the subjects of investigation and all field measurements are done on the spot (Driscol, 2011). Direct observations were carried out in the field through visualisation and an observation guide (Appendix 3).

3.6 Secondary data

Greener (2008), postulated that secondary data is information which the researcher has not gathered directly from the respondents. It is data that would have been collected already and readily available from other sources. In this research secondary data was obtained from Government documents with farmer regulations and laws and agriculture journals.

3.7 Data analysis

Data analysis is the process of transforming raw data into usable information that is often presented in the form of a published analytical article (Statistics Canada 2014). Data analysis is important in that it assists in undertaking results gathered from surveys. According to Kohbacher (2006), raw data can only become useful information after it has been subjected to some form of analysis. Quantitative data from questionnaires was subjected to Microsoft excel for analysis. Statistical findings were presented on graphs, charts and tables for easy interpretation.

Qualitative data from open ended questions and interviews were subjected to content analysis. With content analysis, stories presented by people in different contexts were reformulated in a meaningful manner for easy interpretation. Qualitative data was used to comprehend quantitative data.

3.8 Ethical considerations

Fouca and Mantzorou (2011) define research ethics as requirements on daily work, the protection of dignity of subjects and the publication of the information in the research. Aspects of research ethics like informed consent, anonymity and confidentiality, respect for privacy and consideration of vulnerable groups were considered. The researcher was granted permission by Bindura University to undertake this research and was given a later of consent. Local leaders and District heads were informed before visiting the area. Participants were guaranteed confidentiality of their responses which they were told that will be used purely for academic purposes.

CHAPTER 4: RESULTS AND DISCUSSION

This section will present research findings derived from data collected during field survey so as to address the objectives of this research. It will also provide an in depth analysis of the results so that their implications are clearly presented. The knowledge, attitudes and perceptions of the tobacco farmers in the study area will be explored in a bid to understand inherent mechanisms they have put in place to adhere to legislation whilst striving to make a living from the tobacco farming.

4.1 Research participant's response rate

Table 4.1 shows the response rate for questionnaires used in this study. A total of ninety-three questionnaires were distributed in the studied wards Zvimba District that is 53 questionnaires in ward 28 and 40 questionnaires in ward 19. All these questionnaires were returned for analysis and presentation thus a response rate of 100% was derived.

Table 4.1 Questionnaire survey response rate

Questionnaire respondents	Number of Questionnaires distributed	Questionnaires returned	Response rate
Farmers in ward 23 and 20	93	93	100%

Source. Field data (2020)

Three interviews were conducted as targeted with a 100% interviewee response rate. In this research, interviews mainly targeted Agriculture and Extension Service Department, Forestry Commission and Environmental Management Agency Officer.

4.2 Demography of the respondents

There was a total number of 93 respondents to whom questionnaires were administered in the study area and 6 key informants were interviewed. The socio-demographic characteristics of the respondents revealed complex but systematic patterns in terms of gender, age, level of education, occupation and years lived in the area which helped reveal some common issues

related to these characteristics for instance farmer's attitude towards the legislation that requires them to grow eucalyptus species for tobacco curing.

4.2.1 Gender

The composition of the respondents based on their gender is provided in Figure 4.1. Males constituted 76.7% of the respondents in the study area while females constituted 23.3%. There is no noted significant variation in the gender composition between the two wards under study. This finding is somehow similar to those of Mbaya (2000), who observed that the majority of people involved in tobacco farming are predominantly males as compared to their female counterparts.

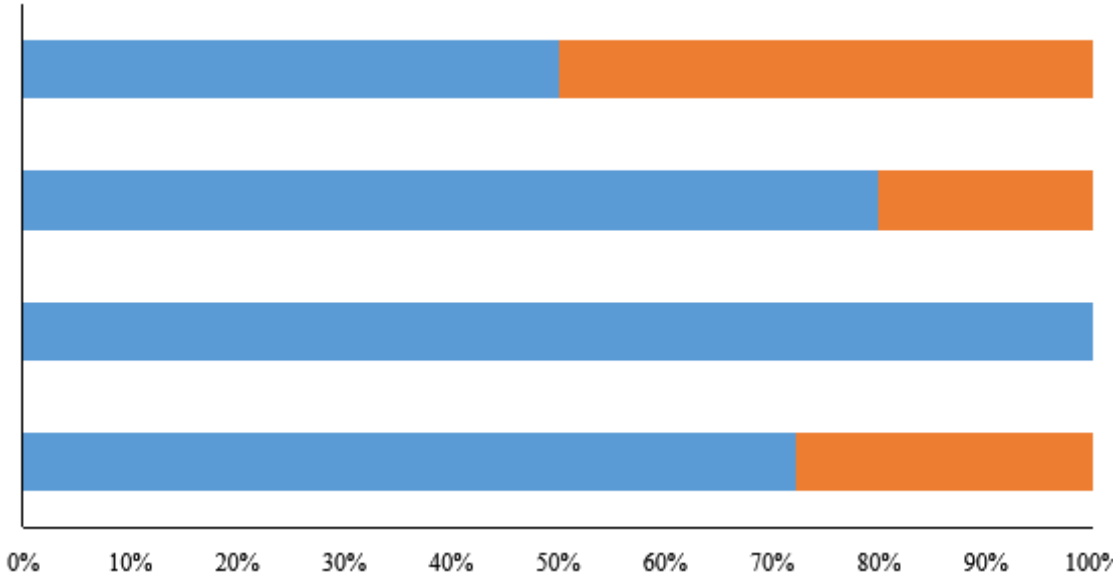

Figure 4.1: Composition of respondents according to gender. [Source: Field data 2020]

4.2.2 Age

The majority of respondents in both Wards 20 and 23 are above the age of 40. This is illustrated in Figure 4.2 in which it is clearly discernible that two dominantly represented age groups in both the wards are the 40 – 49 year olds and the 50years and above age groups.

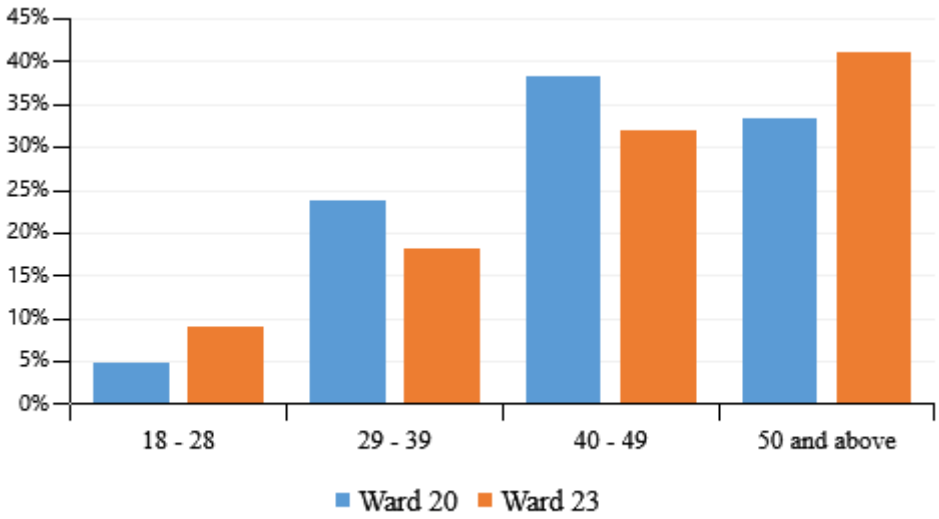

Figure 4.2: Age distribution according to wards. [Source: Field data 2020]

The researcher however did not establish any notable difference between age and any other factor under study in the research. Having noted that, it still is imperative though to have a clear understanding of this crucial components about the nature of respondents in the study area since they may have a significant bearing on knowledge and attitude towards the need to grow eucalyptus trees for tobacco curing.

4.3 Education level of the respondents

It is evident in the research findings that all of the respondents in the study area attained at least a secondary school education while the majority attained a tertiary education qualification in both wards. The different education levels among respondents in Ward 20 are shown in Figure 4.3. Respondents that have tertiary education qualifications in Ward 20 amounted to 62% of the total number while 24% have vocational training. This made it easy for the researcher to administer the questionnaires at the same time improving the quality of responses derived thereof.

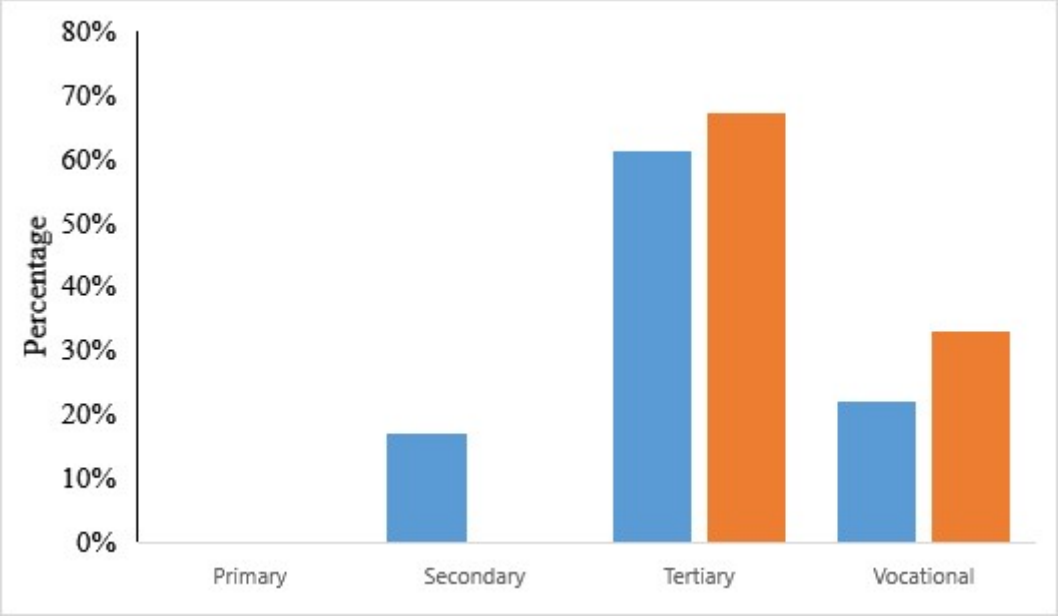

Figure 4.3: Level of education for respondents in Ward 20. [Source: Field data 2020]

Respondents that have tertiary education qualifications in Ward 23 are 77% of the total number of respondents, 9% have acquired secondary education only and 14% have attained vocational training as shown in Figure 4.4.

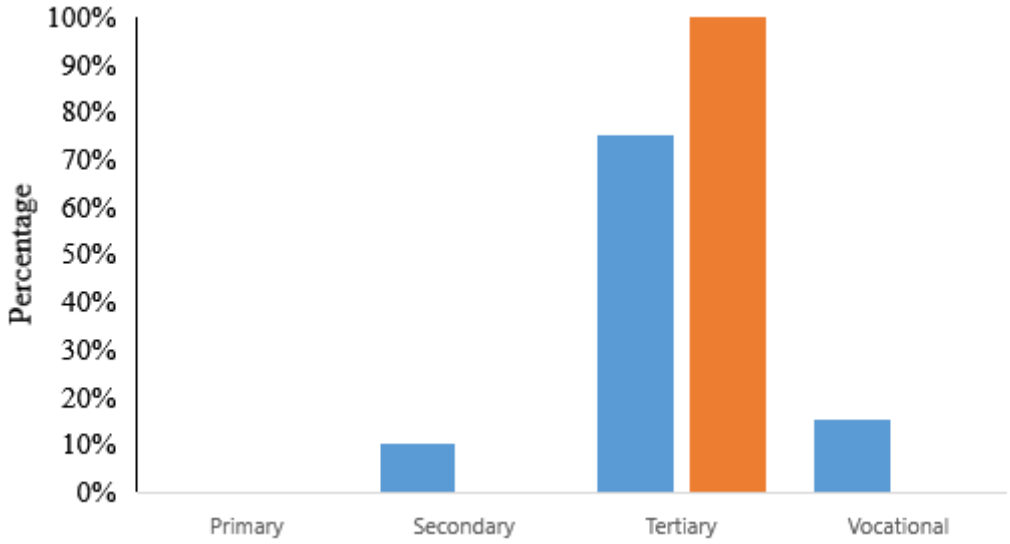

Figure 4.4: Level of education for respondents in Ward 23. [Source: Field data 2020]

Education level attained by interviewed respondents was necessary to understand from the onset since the researcher assumed that this influences the ability of any individual to

understand, interpret, grasp concepts and apply any form of knowledge accumulated. However education generally may not reflect the expected knowledge, attitude or perception. 100% of the interviewed tobacco farmers have some education of some kind, though only 9% of the farmers attained only a secondary school education. This result generally point towards an educated society who should be able to understand information and grasp knowledge better and be able to transfer this in their actions on environmental stewardship. However the results further as will be unravelled in proceeding sections revealed that regardless of the education level and understanding of environmental conservation concepts compliance by tobacco farmers to regulations is a different matter.

4.4 Duration of stay in the area

Respondents that have stayed in the study area for more than 10 years constitute 51.2% of the total number of respondents while those that have resided in the area for 5 – 10 years are 39.5% and 9.3% have resided in the area for less than 5 years.

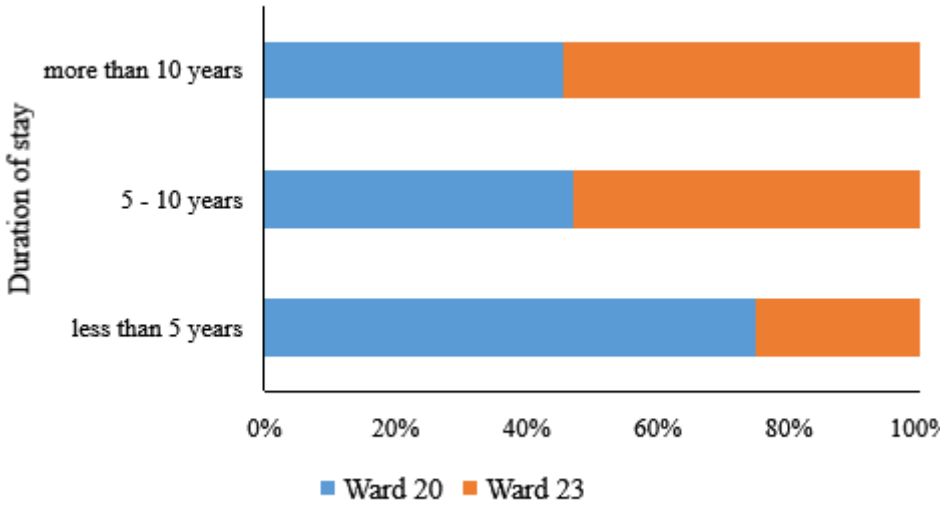

Figure 4.5: The duration of stay of respondents. [Source: Field data 2020]

The farming model and the duration of stay proved to be key aspects in probing the general attitudes and practices of farmers in the area as one major aspect in question is agroforestry which is significantly affected by time. The type of fuel used by the farmers to cure their tobacco in the study area was discovered to be predominantly firewood accounting for 91% of

the fuel used to cure tobacco and only 9% of the famers use coal as illustrated in Figure 4.6. However the 9% of coal users were slightly contestable on testimony of the key informants who provided insight that those farmers who used coal as a source of fuel occasionally used firewood as well hence confirming that the major source of fuel used to cure tobacco is predominantly wood fuel.

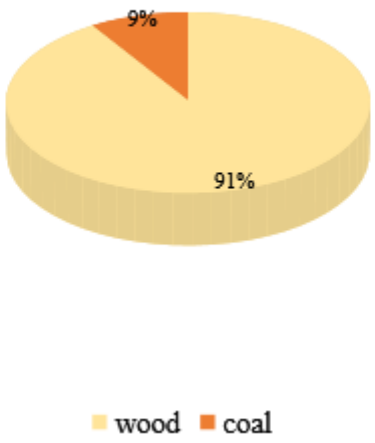

Figure 4.6: Sources of fuel in study area. [Source: Field data 2020]

The main reason for farmers' reliance on wood fuel is that it is cheap and readily available to the farmers. The majority of respondents indicated that they have no other alternative source of fuel except indigenous wood fuel or plantation wood fuel. The number of farmers who use coal was relatively small since it was just 9% being farmers who either afford to buy coal or who have supplied under contract farming. The same facts were also confirmed by key informant interviewees from AGRITEX, EMA and Forestry Commission who indicated that only a few farmers could afford to acquire coal.

4.5 Knowledge level of SI 116 of 2012 by tobacco farmers in Zvimba

The research results showed that 100% of A1 farmers know at least one legislation that governs forests and/or at least one governing authority of this particular legislation. EMA is the most recognised organization that enforces environmental laws in Zvimba. This was confirmed by 77% of respondents in A1 farming schemes as shown in Figure 4.7 and 58% of respondents in A2 farming schemes both of which were the highest figures among the A1 and A2 farmers. Of

note is the fact that the knowledge status among A1 farmers of legislation governing forests is higher than that among A2 farmers as illustrated in Figure 4.7.

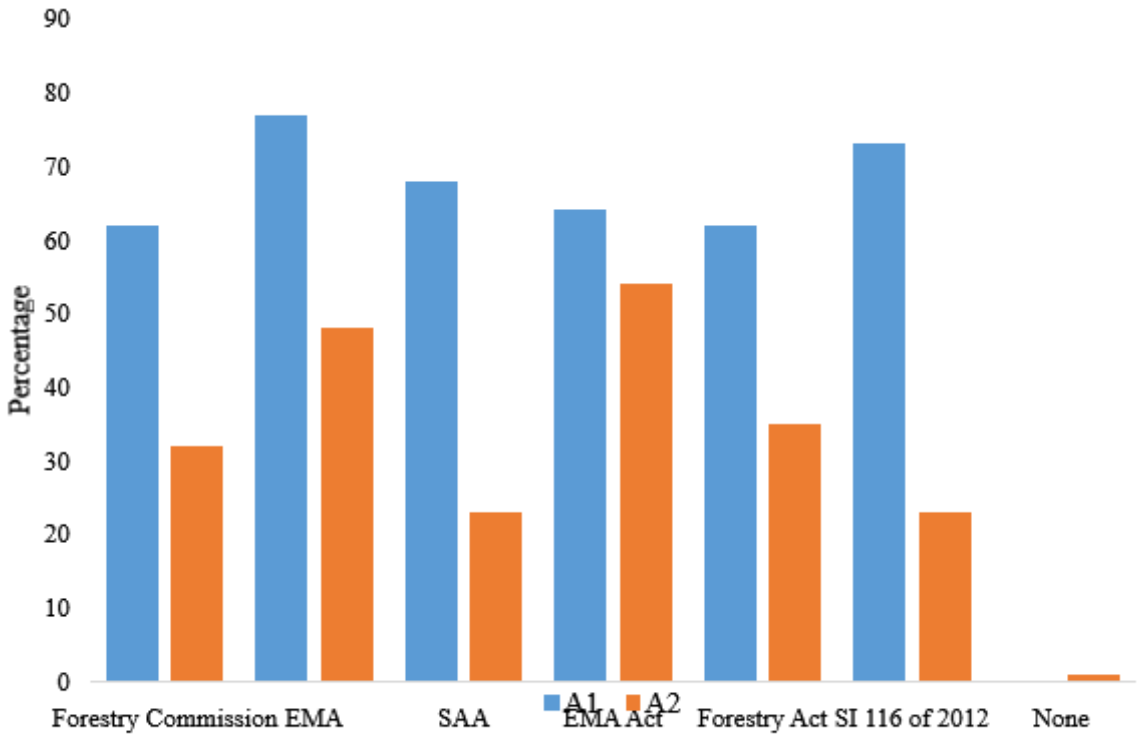

Figure 4.7: Knowledge of legislation and responsible authorities by respondents in study area. [Source: Field data 2020]

It was discovered that 81% of farmers do not have a flue- or flame curing firewood licence for different reasons that include lack of knowledge on the legislation requiring the licenses, failure to see the need for a license, relaxed enforcement of the law as well as constraining economic conditions among other reasons. This therefore formed a basis for probing the different attitudes of the farmers on SI 116 of 2012. During an interview, the EMA Officer highlighted that together with the Forestry Act, they conduct quarterly training, where farmers are conscientised on the benefits of governing natural resource management.

Table 4.2 Chi-square tests results for relationship between education level and knowledge on legislation

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	57.827[a]	28	.007
Likelihood Ratio	58.487	28	.007
N of Valid Cases	43		
a. 34 cells (85.0%) have expected count less than 5. The minimum expected count is 1.38.			

Chi square test results (p=0.007), show that there is no association between education attained by farmers and knowledge on legislation. This means to say that despite attaining high level education, farmers may not be cognisant of the existing pieces of legislation and the responsible authority.

4.6 Attitudes of tobacco farmers in Zvimba towards SI 116 of 2012

Farmers in Zvimba concurred to a greater extent that the use of eucalyptus wood fuel for curing tobacco significantly reduces or even prevent deforestation (65% of the farmers) and that farmers should grow the eucalyptus trees so as to avoid use of indigenous trees (79%). The need to abide to laws by farmers was also acknowledged by 86% of the farmers who also mentioned that aside form laws governed by such authoritative bodies as Forestry Commission they also recognise local authority laws administered by traditional leaders. However, having noted all these realisations by the farmers what is of interest are the particular attitudes adopted by the farmers to what they are expected to do by the law.

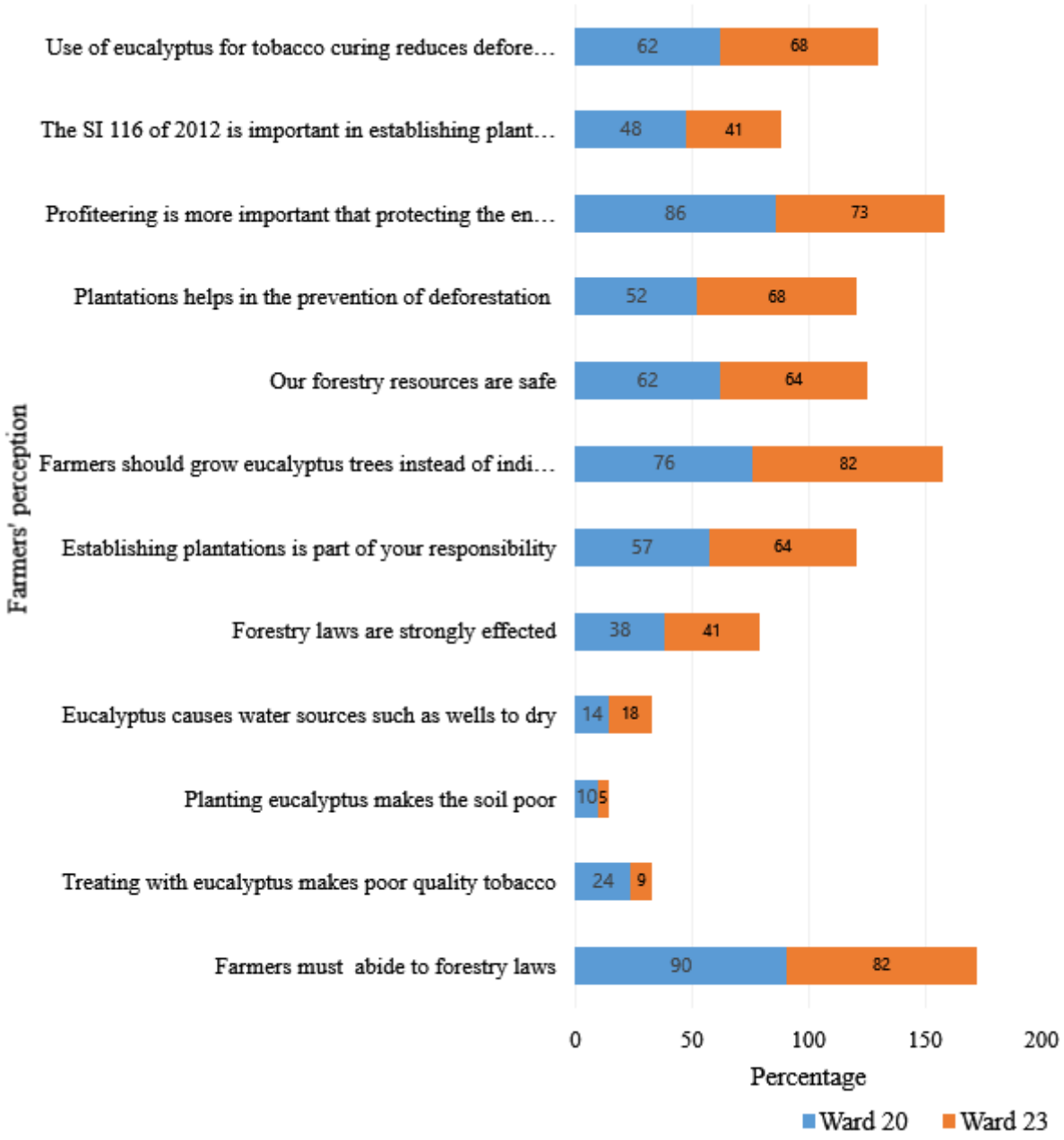

Figure 4.8: Attitude of respondents according to farm model. [Source: Field data 2020]

The majority of respondents, 79.5% in particular were frank enough to mention that they consider making profit from their tobacco sales over anything else in order to make a living (Figure 4.8). They instead can do whatever it takes to reduce costs incurred during the growing and curing process so as to obtain maximum profit from the harvest. This is on account of the harsh economic climate as well as relaxed law enforcement coupled with wood poachers. The farmers indicated that it is difficult to comply and in some cases incur costs while some of the

tobacco farmers would be lessening costs by utilising cheaply available wood fuel. 44.5% of the farmers felt that SI 116 of 2012 is important to enforce establishment of plantations which was confirmed by 60.5% of the farmers who felt that growing eucalyptus plantations is the farmer's responsibility. However, 39.5% of the farmers cited poor enforcement of the SI 116 of 2012 as a key challenge towards sustainable use of forest resources. The general contention was, stakeholder organization such as EMA and the Forestry Commission were failing to strictly and regularly enforce the law.

The assertion by farmers that law enforcement was not adequate was confirmed by the key informants who attributed this challenge to manpower shortage, financial constraints and failure of all forestry related players to coordinate and work together towards achievement of one goal. That is for instance duplication of legislation such as EMA Act and Forestry Act. As a result of the "supposed feebleness" of law enforcement the offenders and any irresponsible farmers are not deterred or apprehended thereby giving room for indiscriminate cutting down of trees to take place. About 11% of the respondents perceive trees especially those found within their respective farms as free access resources which is notable challenge given by the key respondents. For that reason officials face challenges in enforcing the law and preventing deforestation in farms. This is worsened by wood poachers who make a living from selling wood fuel to tobacco farmers coupled with lack of concern from the tobacco farmers to request provision of wood sellers' licenses before dealing with them hence indiscriminate cutting down of trees.

Tobacco farmers' attitudes are key in forest resources management. A worrisome proportion of the population felt eucalyptus plantations pose a danger to their land and water resources. This was cited by 16% of respondents who felt that eucalyptus plantations dwindle underground water sources such as wells, 7.5% stated that the plantations reduce soil quality and 16.5% mentioned that curing tobacco with eucalyptus wood makes the degrades the quality of tobacco. This attitude is an antecedent to poor forest resources management and a direct threat to indigenous forests. The unprecedented growth in the number of small holder tobacco farmers is also a challenge. This is supported by EMA, Forestry Commission and Agritex officials. Generally 91% of farmers in the study area use wood fuel regardless of the fact that

coal can be used as an alternative source of fuel. Coal is used by just 9% because it is expensive and not readily available.

Over and above stated perceptions of the farmers, it is imperative to highlight that the farmers are affected by limited financial resources to build recommended and efficient barns, veld fires, and shortage of land for woodlots resulting in varying woodlot sizes as well as claims of corruption by law enforcers. The researcher noted that regardless how large or small a number of respondents posited a certain aspect, it is imperative for this research to treat it as a potential hindrance to forest resources management. Lack of stakeholder coordination and concerted effort in forest resources management was cited as a major issue where isolated efforts are made by each forest management body parallel to the others. This could effectively reduce problems of funding and manpower shortage if well-coordinated.

4.7 Practices by tobacco farmers in Zvimba

The preceding section that discussed farmers' attitudes partly discussed some of the practices by these farmers as the attitudes coupled with other offsetting factors subsequently influence a farmer's practice. Smallholder farmers due to unavailability of large tracts of land prioritise growing of food and cash crops over establishing eucalyptus plantations. This is confirmed by the statistics in Figure 4.9 which cleared shows how only an average of 8.9% of A2 farmers are not planting woodlots for tobacco curing on their farms. An average of 58.7% of the A1 farmers on the other hand are practicing exotic woodlot plantations for purposes of supplying wood fuel for tobacco curing. This significantly varies with the practice among A2 farmers that evidently are not complying with the regulation to provide wood fuel for their processing of tobacco. As noted previously this is mostly attributed to the fact that prioritising between establishing their own or community woodlots they prefer sustaining their food and financial needs first in place of forest resources management. This is further made difficult due to the fact that they are not contracted by tobacco companies to grow the tobacco and hence inputs such as seedlings are not availed to them.

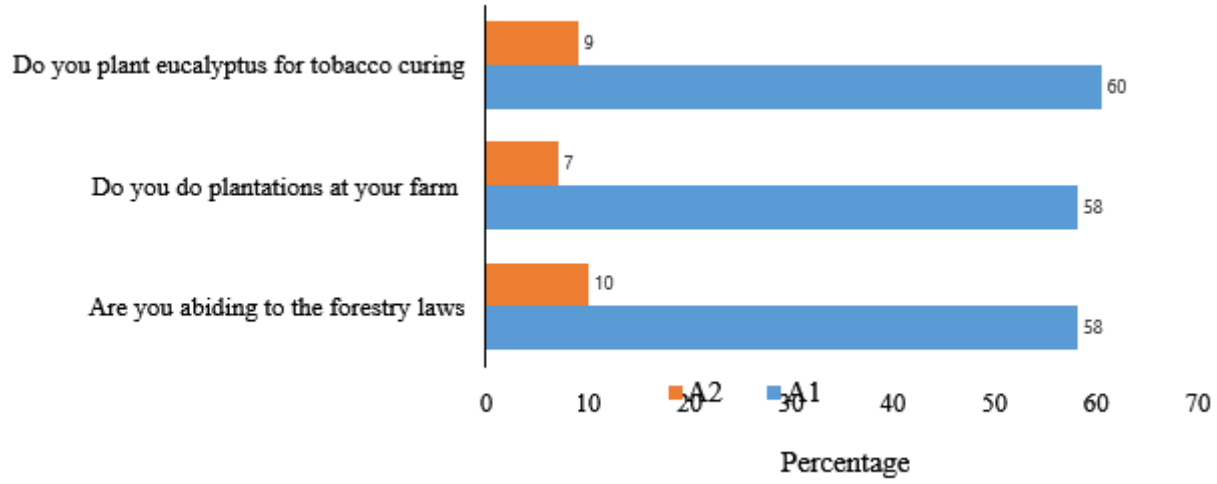

Figure 4.9: Practice of respondents according to farm model. [Source: Field data 2020]

The A2 farmers confirmed that they mostly use any available option to process their tobacco which range from using nearby indigenous wood, sourcing wood elsewhere or buying wood from cheap sources. In spite of their practices the A2 farmers concurred with the A1 farmers on the need to redress forest management and halt or lessen deforestation. This is shown in Figure 4.10 in which all farmers saw the need for afforestation, establishment of plantations as an alternative for indigenous forests or enforcement of the laws so as to curb deforestation.

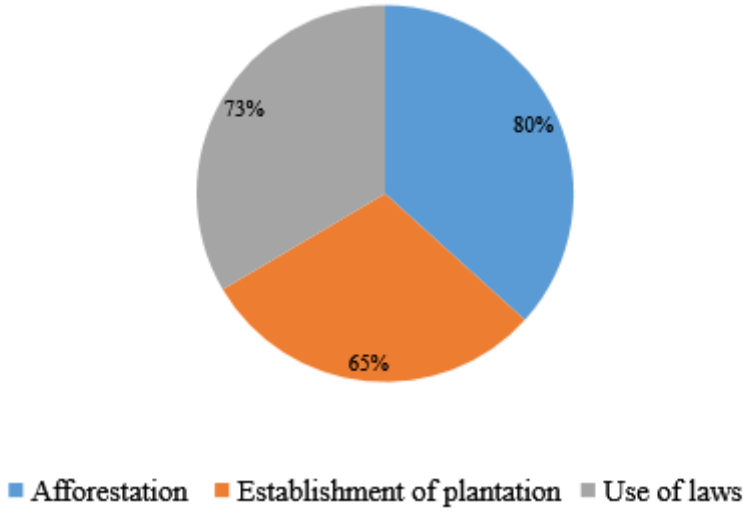

Figure 4.10: Proposed measures to reduce deforestation by respondents. [Source: Field data 2020]

According to Figure 4.6 there are 91% of the farmers in the study area who use wood fuel for tobacco curing as compared to 9% which makes it imperative for the practices of the farmers a major concern. If the bulk of the farmers use wood fuel and their practices are detrimental to the existing forests then deforestation will be rampant. Indiscriminate cutting down of trees mostly by the small holder farmers is the biggest issue of concern notwithstanding the contribution of A1 farmers as well.

4.7.1 Relationship between duration of stay in the area and tobacco farmer practises

Chi-square tests results (p=0.001) show that there is a significant relationship between duration of stay in the areas and framers practise. Interpreted this means to say that for example a farmer who has stayed for a short period of time may not have embarked on practises which require prolonged periods of time for example practises such as growing of woodlots for tobacco curing. As such some farmers were resorting to use of other sources of fuel such as wood.

Table 4.3: Chi-square test results for relationship between duration of stay in the area and tobacco farmer practises

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	57.827[a]	28	.001
Likelihood Ratio	58.487	28	.001
N of Valid Cases	43		
a. 34 cells (85.0%) have expected count less than 5. The minimum expected count is 1.38.			

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

A number of inferences can be derived from the research findings. A major conclusion in this research is that heightened deforestation in the study area and consequently other tobacco growing regions within Zimbabwe can be traced back to tobacco farming coupled with other causes but largely due to intense reliance on wood fuel for tobacco curing purposes by farmers. This is mostly rampant in the small scale tobacco farming areas and/or resettlement areas. The clearing of tracts of land in newly resettled areas is equally a considerable agent of deforestation as much as the need for wood fuel.

A worrying fact from the research findings is that the majority of farmers in Zvimba rely on indigenous wood fuel as they do not provide grow exotic forest plantations. Few farmers have established exotic woodlots and among those who have established these woodlots quite a sizeable number of them have fairly small woodlots. This subsequently contributes to forest resources depletion since the level of depletion far outpaces the rates of restoration. Notwithstanding this predicament, a very small proportion of the farmers use coal as an alternative for tobacco curing due to differing reasons which are mostly eclipsed by financial constraints

A major point of diversion in forest resources management that was stressed in the research findings is the growing need for farmers to grow cash crops as evidenced by the increase in tobacco famers (mostly A2 famers). As a result tobacco farming is a dominant source of income in the region which triggers a dire need to intervene in the tobacco farming process so as to halt the otherwise unabated simultaneous rise in tobacco farmers and deforestation.

There is a considerable group of farmers who are newly settled in the Zvimba area hence they do not in any way have access to fully grown exotic woodlots even if they had made necessary provisions to grow eucalyptus trees hence exploitation of indigenous trees in inevitable. Those farmers who get assistance form tobacco contractors certainly receive provision eucalyptus tree seedlings which become harvestable in at least 5 years which does not encourage the

farmers to practice any sustainable forest management as they certainly are in dire need to make a living from the tobacco farming.

Without question the research unearthed that farmers have been found wanting I terms of complying with regulations that require them to play their part in forest resources management. The governing bodies for these particular legislation themselves have their shortcomings in enforcing the laws due to financial and administrative constraints among other challenges. Many as they may be, the governing bodies have failed to harmonise their efforts and resources in tackling the same forest resources management issues in the same area and so the resultant enforcement form the different institutions has been severely compromised and inadequate. As a result of these highlighted issues, beyond any reasonable doubt forests in Zvimba are certainly under threat from a combination of high risk practices coupled with inefficient law enforcement.

5.2 Recommendations

The following recommendations have been posited in consideration of the conclusions drawn from the research findings.

Recommendation	Responsible stakeholder
There is need for harmonized and coordinated effort by government institutions and all stakeholders in industry to ensure sustainable tobacco production that does not jeopardize forest resources.	All government institutions (EMA, Forestry Commission, Department of AGRITEX, District Development Coordinator's Office, Ward Chairpersons, Ward Councillors) and industry private players such as tobacco contractors, TIMB
Provision of alternative fuel in place of the commonly used wood fuel such as coal and/or exotic forests for example is a necessity. Therefore it might be imperative to fund establishment and availability of these alternative fuels so as to shift reliance form wood fuel.	

A major problem of deforestation is caused by tobacco farmers that are unregistered, hence there is need to ensure all tobacco farmers are registered. This will make monitoring of the farmers easier. Measures can be put in place to stop unregistered farmers form growing and selling tobacco as a deterrent to unregistered tobacco farmers.	The Tobacco Industry and Marketing Board
In a bid to resolve the problem of land shortage for growing exotic woodlots on individual farms, provision of land for establishment of more community woodlots is an alternative which lessen pressure in terms of time and resources on individual farmers and spread the responsibility on the whole community.	Ministry of Lands and Rural Resettlement and local authorities
Sustainable forest resources management must be taught to tobacco farmers mainly due to the evolving nature of the group. New tobacco farmers emerge almost in each season due to the need for income hence constant education to the farmers is necessary in order to enlighten them. The research established that the level of knowledge among the A2 tobacco farmers especially is unsatisfyingly displeasing.	
Over and above all the suggested recommendations, government must tighten its law enforcement and ensure farmers that fail to comply with regulations become answerable and pay accordingly for whatever transgression they would have made. The penalties for any failure to comply with regulations must be deterrent enough to ensure farmers do not prefer to flout the law and opt for taking the penalty which would not be deterrent enough instead. To ensure that this is effectively done the government must provide	

sufficient funds and manpower to relevant institutions.	

REFERENCES

Acharya, B (2010). Questionnaire design: Training-cum workshop in Research Methodology, Nepal. Tribhuvani Univesity.

Castillo, J,J (2009) Random Sampling, accessed on 16/8/17 Cohen, L., Manion, L. and Morrison, K. (2007). *Research Method in Education*, Sixth Edition, New York, USA: Routledge

Driscoll, D. L. (2011). Introduction to Primary Research: Observation, Survey and Interviews, Writing spaces: Readings and writing Volume 2, Califonia, USA

FAO, (1997) Marketing research and information systems, available at www.fao.org accessed on 06/07/20

Kohlbacher (2006) The use of qualitative content Analysis in case study research Journal on forum qualitative social research. Available at www.qualitative-research.net accessed on 20/07/20

Langen, A (2009) Research design and methodology. Available at www.ais.utm.mgl.research portal accessed on 06\07\20

Length R,V (2009) Some Guidelines for effective sample size determination. The American Statistical Journal pp 187-195

Statistics Canada (2014) Data analysis (and presentation) available at ww.statcan.gc.ca

APPENDICES

Appendix 1: Survey Questionnaire

ASSESSMENT OF FARMER'S KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS THE SI 116 OF 2012 REGARDING THEM TO GROW EUCALYPTUS TREES FOR TOBACCO CURING

Good day. My name is Terance Runganga, I'm a student at Bindura University of Science Education pursuing an undergraduate degree in NRM. I'm required to carry out a research project in partial fulfilment of the requirement of the degree. I'm kindly asking your assistance as despondence to the research understudy by fulfilling the questionnaire. The responses you provide will be treated with utmost confidentiality and will be used sorely for academic purposes. Your cooperation will be greatly appreciated.

Instructions to respondents

- Do not write your name on any part of the paper.
- Tick the appropriate answer.
- Fill the provided spaces where applicable.

DEMOGRAPHY

GENERAL INFORMATION

Gender

1. ☐ Male ☐ female

2. Age despondence

18-28 ☐ 29-39 ☐ 40-49 ☐ 50 and above ☐

3. Academic qualifications

Primary level ☐ secondary level ☐ tertiary level ☐ Vocational training ☐

4. Period of stay in the area

Less than 5yrs ☐ 5-10 years ☐ more than 10 years ☐

5. Farm model

A1 model ☐ A2 Model ☐

6. Average income

Less than RTGS 500 ☐ RTGS1000-10000 ☐ more than RTGS10000 ☐

B. KNOWLEDGE

7. Do you know of the law that requires you to plant woodlots for tobacco curing?

Yes ☐ no ☐

If yes, what is it called…….

8. Which one of the following departments do you know?

Forestry Commission ☐ EMA ☐ SAA ☐

9. Do you know that tobacco companies offer free seedlings to farmers who by tobacco seed yearly? Yes ☐ **no** ☐

10. Which one of the following do you know?

EMA Act ☐ forestry Act ☐ SI 116 of 2012 ☐ none ☐

11. Which of the following licenses should be obtained by tobacco farmers

Firewood traders license ☐ timber trader's license ☐ flue or flame curing firewood license ☐

12. Which of the following is a penalty for cutting down trees?

Community service ☐ jail ☐ paying fine to forestry commission ☐ don't know ☐

13. Which farm model is required to grow trees for tobacco curing?

A1 model ☐ A2 Model ☐ communal ☐ all of them ☐

14. Who has the responsibility to grow eucalyptus trees for tobacco curing?

Rural District council ☐ EMA ☐ Forest commission ☐

Government departments ☐ everyone ☐

15 What can be done to ensure that farmers establish eucalyptus woodlots?

By creating awareness ☐ law enforcement ☐ nothing can be done ☐

Other ……

16 How long do gum trees take to reach maturity or to be ready for harvesting?

Less than 5 years ☐ 5 – 10 years ☐ 11 – 15 years ☐

17. Which one of the following is the recommended spacing for eucalyptus woodlots?

1 x 1 ☐ **2 x 2** ☐ **4 x 4** ☐

ATTITUDES (Tick where appropriate)

No	QUESTION	Strongly agree	agree	disagree	Strongly disagree
18	People should always abide to and be controlled by forestry laws				
29	Treating tobacco with eucalyptus makes poor quality tobacco				
20	Planting eucalyptus makes the soil poor				
21	Growing eucalyptus is not good because it causes water sources such as wells to dry				
22	Forestry laws are strongly effected				
23	Establishing plantations is part of your responsibility				
24	People should use fast growing eucalyptus trees other than using indigenous trees for tobacco curing				
25	Our forestry resources are safe				
26	Establishment of plantations helps in the prevention of deforestation				
27	Profit making is more important that protecting the environment				
28	Do you agree that the SI 116 of 2012 is important in encouraging people to establish plantations				
29	Do you agree that the use of eucalyptus for tobacco curing reduces deforestation				

30. What re the advantages of planting eucalyptus

……

……

31. What re he disadvantages of planting eucalyptus

……

……

SECTION D PRACTICES

No	QUESTION	ALWAYS	OFTEN	SOMETIMES	RARELY	NEVER
32	Are you abiding to the forestry laws					
33	Do you do plantations at your farm					
34	How frequent do you grow eucalyptus trees for tobacco curing					
35	How frequent do you use eucalyptus for tobacco curing					
36	How frequent do people follow the need of the legislation that requires them to do plantations					
37	How frequent do you use coal in curing tobacco.					
38	Do you plant eucalyptus for tobacco curing					

39. What are you doing in your farming areas to reduce deforestation in your area?

Afforestation ☐ establishment of plantation ☐ use of laws ☐

40. Have you been supplied with free eucalyptus seedlings Yes ☐ No ☐

If yes, what happened to them?

……

……

THANK YOU FOR PARTICIPATION

Appendix 2: Interview Schedule for Key Respondents