AFRICA UNIVERSITY

(A United Methodist-Related Institution)

KNOWLEDGE, ATTITUDES AND PRACTICES OF SMALL-SCALE TOBACCO FARMERS ON AGRICULTURAL DIVERSIFICATION: A CASE STUDY OF HURUNGWE DISTRICT, ZIMBABWE

BY

ROBERT TINASHE KUTSUKUTSA

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN AGRIBUSINESS MANAGEMENT IN THE COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

2022

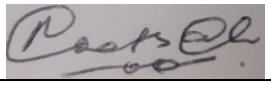
Abstract

The focus of this study was to establish the nature and state of knowledge, attitude, and practice of agricultural diversification by small-scale tobacco farmers in Hurungwe District. The study utilised quantitative techniques to analyse data collected from 158 small scale tobacco farmers. The data was analysed using both descriptive and inferential statistics. The descriptive statistics involved measures of central tendency, cross tabulations, and scoring. For inferential statistics, Tobit Regression and Binary Logistic Regression were used to assess the determinants of knowledge and attitude, respectively. The influence of different socio-economic demographic characteristics, knowledge, and attitude on the practice of agricultural diversification was determined using the Binary Logistic Regression. The majority (67%) of households are headed by men and have fair access to both media and extension services. Most households are headed by people above the age of 45. Farmers had fair knowledge of agricultural diversification principles and practices. The Attitude Score was 374/790 and the Attitude Index was 0.47; the generalised attitude of farmers towards agricultural diversification was negative. Regression analysis showed that knowledge and attitude are both shaped by access to media and extension. Agricultural diversification is being practiced at subsistence level and tobacco is the sole cash crop for many farmers. The Binary Logistic Regression analysis showed that the practice of agricultural diversification is significantly influenced by education level of household head, knowledge, attitude, farm size, and access to media. Tobacco growing experience, age and gender of household head, educational level and access to extension were not statistically significant. The study concluded that small scale tobacco farmers possess knowledge on agricultural diversification, though their attitude is negative. The practice of agricultural diversification by small-scale tobacco farmers is still marginal as most are doing it at subsistence level. Farm size, attitude and knowledge of the farmers pose the main influence on the decisions of farmers to diversify, and both are influenced by access to extension and media. Thus, mass media campaigns and reformation of extension services can be effective tools in communicating the diversification policy to farmers and a source of instant feedback. Policy efforts must be directed to training of farmers through extension and media campaigns to improve their knowledge and change their attitude towards agricultural diversification. The study recommends rolling out of mass media campaigns and reform of extension services to include content on agricultural diversification especially for extension workers from tobacco companies.

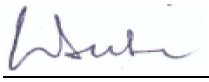
Key words: agricultural diversification, knowledge, attitude, practice

Declaration Page

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree.

Robert Tinashe Kutsukutsa  (17/05/2021)

Student's Full Name **Student's Signature (Date)**

Professor Lighton Dube  (17/05/2021)

Main Supervisor **Main supervisor's Signature (Date)**

Copyright

Acknowledgements

My sincere gratitude goes to Professor L. Dube, my main supervisor for his unwavering support throughout the whole process. Indeed, he is a river not a puddle. He taught me independence, creativity, innovativeness, and flexibility, all which formed the basis and shape of this study. To Dr. K. Mukumbi, thank you for your untiring support and guidance. Your encouragement made the difficult concepts easier and always emphasised on the importance of doing things in time. The support that I got from TIMB and my supervisor Mr F. Tivagare can never go unnoticed. Finally, family and friends, you made this possible. This work is ours!

Dedication

To the future generation of research enthusiasts and global tobacco industry. I did my part; criticism is part of the academic life. “No matter what he does, every person on earth plays a central role in the history of the world” (Paul Coelho).

Definition of Key Terms

Agricultural diversification: the practice of more than one crop or livestock commercial activities on a farm and producing value-added products. Barghouti *et al*. (2004) elaborates that agricultural diversification is a differentiated form of agricultural development and recognised its role in spurring sustainable growth in rural economies.

KAP framework: Medicins du Monde (2011) defined the KAP framework as a quantitative method that is constituted by predefined questions in a standardised questionnaire. It gives both quantitative and qualitative information that reveal misconceptions or misunderstandings that may represent obstacles to achieving a particular subject.

Knowledge: The Oxford English Dictionary views knowledge as "facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject". In this study, it implies awareness or familiarity gained by experience of agricultural diversification.

Attitude: the way of thinking or feeling about something. It encompasses farmers' settled way of thinking or feeling about a given subject. Attitude "expresses passions and hates, attractions and repulsions, likes and dislikes" about a given subject (Daniel *et al*., 1998)

Practice: actual application of agricultural diversification principles. In agriculture, it refers to the application of basic principles of a given technology or production method to farm processes in order to achieve better agricultural results.

Small-scale tobacco farmer: a tobacco grower registered by the Tobacco Industry and Marketing Board and owns not more than 10 hectares of land (TIMB, 2019)

List of Acronyms and Abbreviations

KAP – Knowledge, Attitude and Practice

LRP – Land Reform Program

SCT – Social Cognitive Theory

SID – Simpson Index of Diversification

TIMB – Tobacco Industry and Marketing Board

TRB – Tobacco Research Board

WHO FCTC – World Health Organisation Framework Convention on Tobacco Control

ZTA – Zimbabwe Tobacco Association

Table of Contents

List of Tables

List of Figures

List of Appendices

CHAPTER 1 INTRODUCTION

1.1 Introduction

This chapter defines the problem that inspired the research. It states what this research intends to achieve and the significance of the study. It shall also spell what this research is and what it is not, an outline of the boundaries of the research. It shall end by outlining the ethical issues considered by this research.

1.2 Background to the study

Tobacco farming is an important sector in the Zimbabwean economy, contributing approximately 10 percent of the gross domestic product and employing around 60 percent of the economically active people (Chitongo, 2017; Khumalo, 2013; Scoones *et al*., 2018). Apart from this, 15 to 25 percent of the country's export earnings, according to ZTA (2015), comes from tobacco. Farm business strategy revolves around tobacco especially in Northern Zimbabwe farms and the majority of farmers bank on the crop as their main commercial enterprise (Chitongo, 2017 and Khumalo, 2013). According to the Tobacco Industry and Marketing Board (TIMB), tobacco production has been on the increase, reaching an all-time high of 259 million kilograms in 2019 (TIMB, 2019). Because of several factors such as market access, profitability and, contractual support, the number of registered farmers has been above 150 000 since 2017 and new entrants into tobacco farming have also been increasing.

The Zimbabwean tobacco industry is growing amid the decline in tobacco demand as reported by Euromonitor International (2018). According to Bialous (2019) and Wisdom *et al*. (2018), the decline is among other factors, influenced by the World Health Organisation's Framework Convention on Tobacco Control (WHO FCTC) and deforestation. The WHO FCTC is a treaty amongst United Nations' member countries and aims at reducing tobacco consumption through both tax and legislative measures

(WHO, 2005). The tax measures are aimed at reducing the affordability of smoking while the regulatory measures are aimed at reducing access to tobacco.

Regardless of the frantic efforts by the tobacco industry to influence tobacco restriction policies, the WHO FCTC was passed in 2005 and has received support from most European countries and the United States of America (Bialous, 2019). To date, the treaty has been signed by 168 countries and ratified in 182 countries (WHO, 2020). The implementation of WHO FCTC recommendations has resulted in a decline in the consumption of tobacco products in these regions (Craig, Fong, Chung-Hall & Puska, 2019; Wisdom *et al*., 2018). Although some corporates such as Phillip Morris International are investing in less harmful products such as heated water pipe tobacco (Mallock, Pieper, Hutzler, Henkler-Stephani, 2019), the demand for tobacco keeps declining.

Zimbabwe has shifted its export markets to the Far East, which absorbs about 80% of its production (Euromonitor International, 2018) but it has also been reported that the number of smokers in the Far East is also decreasing as tobacco become unaffordable to many smokers as a result of increased taxes and legislative measures. The demand for tobacco is projected to keep declining (Euromonitor International, 2018; Mbulukwa, 2017). Agricultural diversification has been recommended for tobacco farmers, particularly the small-scale farmers to sustain rural development and prevent loss of livelihoods.

According to Mbulukwa (2017) and Swarnam *et al.* (2018) agricultural diversification refers to the inclusion of different agricultural enterprises into a farm's agribusiness model. Mango *et al*. (2018) specified that "diversification is one viable option in smallholder farming that can ensure the establishment of resilient agricultural systems that can contribute significantly to household food security". This implies that

agricultural diversification is of paramount importance to tobacco farmers in Zimbabwe. Nevertheless, the extent to which the tobacco farmers in Zimbabwe practice and know agricultural diversification as well as their attitudes towards the same are not well documented.

1.3 Statement of the problem

Small scale tobacco farmers in Zimbabwe have over-relied on tobacco farming as their commercial enterprise (Khumalo, 2013; Mbulukwa, 2017). This is an unfavourable scenario considering the global decline in tobacco demand and the negative carbon footprint caused by tobacco. Several scholars have recommended agricultural diversification to establish resilient agricultural systems that can sustain household food and livelihood security. However, little is known about the knowledge, attitudes, and practices of the farmers on agricultural diversification.

1.3.1 Purpose of the study

The purpose of this study was to assess the knowledge, attitudes, and practices of agricultural diversification by small-scale tobacco farmers in Zimbabwe.

1.4 Research objectives

The specific objectives of this study were:

1. To ascertain knowledge of agricultural diversification by small scale tobacco farmers in Zimbabwe
2. To determine the attitude of small-scale tobacco farmers towards agricultural diversification
3. To establish practices of agricultural diversification by small-scale tobacco farmers in Zimbabwe

4. To investigate the influence of knowledge, attitude and socio-economic demographic characteristics of small-scale tobacco farmers' practice of agricultural diversification

1.5 Research Questions

1. What is the knowledge of small-scale tobacco farmers on agricultural diversification?
2. What do small-scale tobacco farmers feel or think about agricultural diversification?
3. To what extend are small-scale tobacco farmers are practicing agricultural diversification?
4. What influence do knowledge, attitude and socio-economic demographic characteristics have on the practice of agricultural diversification by small-scale tobacco farmers?

1.6 Assumptions of the study

This study primarily assumes that the farmers have once heard of agricultural diversification and they will be honest in all their responses. The assumption is based on the belief that there will not be any information asymmetry between the farmer and the researcher that is, the two will have the same level of understanding of the subject. Besides, it was also assumed that there are tobacco farmers who have general knowledge, attitudes, and practices of agricultural diversification and that there exist variations concerning the three aspects (knowledge, attitudes, and practices). Khumalo (2013) asserted that tobacco farmers in Zimbabwe had a general awareness of agricultural diversification and suggested an inquiry into the knowledge, attitudes, and practices of agricultural diversification. Finally, the study assumes that all the tobacco

growing wards in the study area will be accessible. The assumptions are based on the restrictions put in place because of the Covid-19 virus.

1.7 Significance of study

This research shall inform government or policy-maker programs; it helps in understanding the target population better. The policy making process would require a comprehensive understanding of the target population as this influences the ultimate efficiency of the policy. Without understanding the knowledge, attitude and practices (KAP), there will be higher chances of misallocation of resources.

Again, the research shall be the basis for future research or policy evaluations as KAP studies are reported to work well in before-after analysis. For instance, a similar study can be conducted after agricultural diversification policy intervention and compare the results to see if there has been an improvement.

The investigation shall also add substance to the body of knowledge as most KAP studies were conducted in the medical and nutrition fields.

1.8 Delimitations of the study

This study focussed on farmers in Hurungwe district. Hurungwe District is in Mashonaland West Province and is the most prominent tobacco-growing district in Zimbabwe (TIMB, 2019). By statistics, Hurungwe had 24% of the total growers in 2019 and delivered 19% of the national tobacco output in the same year (TIMB, 2019). The district is warm throughout the year and is about 1 344 meters above sea level.

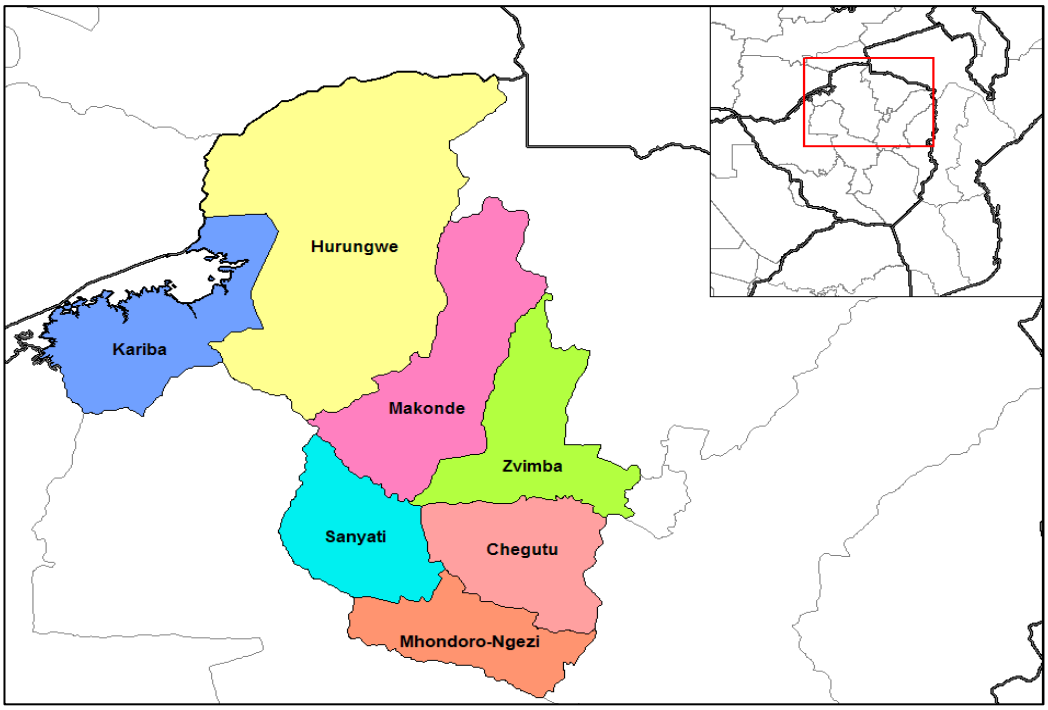


Figure 1.1: Geographical location of Hurugwe District, Mashonaland West Province, Zimbabwe

1.9 Limitations of the study

This study may be limited by farmers' failure to understand agricultural diversification in the context that the researcher understands it. The research shall simplify the definition and make sure the concept is well explained before the farmer gives feedback on the interview questions.

In addition, farmers' fear of breach of privacy and confidentiality may hinder the success of this study. The research will specify in his introduction, their commitment to informed consent and confidentiality. Biased responses are also a possible limitation to this study as some farmers may be anticipating subsidies for the usual government and private sector programs. It shall be specified that the research is solely for academic purposes.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter is a review of scholarly and other research work that preceded this research. It covers a range of subjects from general tobacco production in Zimbabwe to theories, perspectives and frameworks explaining the concept of KAP. The chapter shall end by laying out conceptual distinctions and organisation of ideas.

2.1.1 Tobacco production in Zimbabwe

Tobacco production in Zimbabwe dates back to the early 1900s where a landrace *Nicotiana rustica* (L) also known as *Nyoka* tobacco was grown (Garwe, 2019; Scoones *et al*., 2018). The adoption of tobacco as a commercial crop commenced later after introduction and promotion of commercial varieties by the British South African Company (Garwe, 2019). Since then, Scoones *et al*., (2018) asserts that the industry has gone through several phases of both social and economic development.

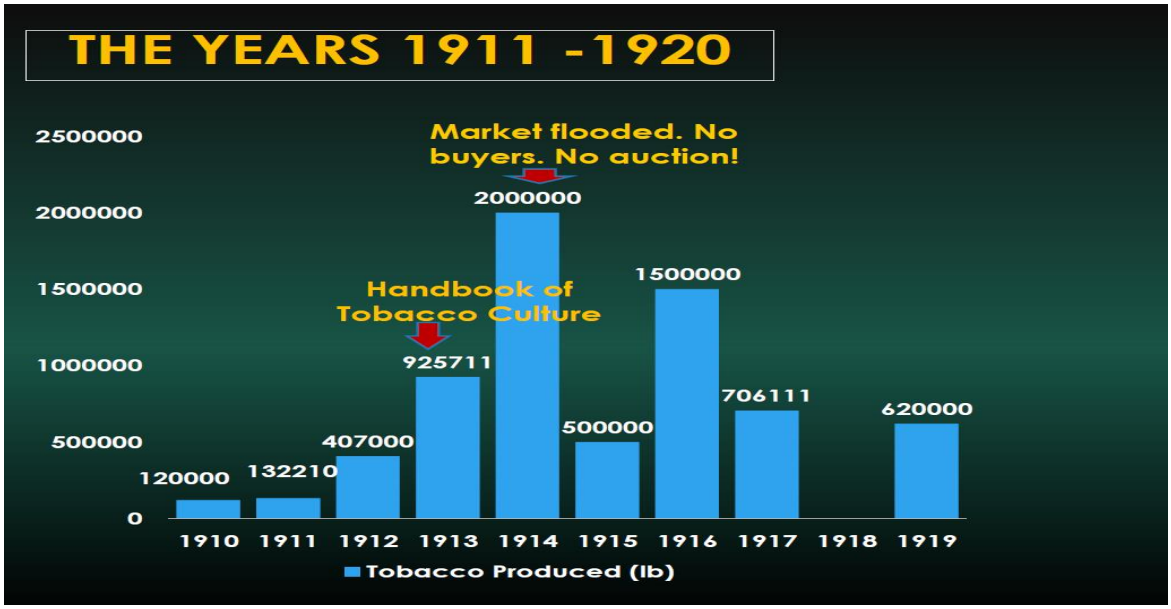


Figure 2.1: Dynamics of the tobacco industry from the period 1910 to 1919 *(Source: Garwe, 2018)*

As shown in Figure 2.1 above, the tobacco industry went through a self-regulating phase between 1910 and 1919. In 1914, two million kilograms of tobacco were produced resulting in a flooded market and a fall in production in the subsequent years. Post-1919, the industry collapsed due to lack of competition amongst buyers and subsequent drop in prices (Garwe, 2019; TIMB, 2019). According to TIMB (2019b), the late 1930s saw the revival of the industry and a few large-scale commercial white farmers participated in the industry and tobacco increasingly became an a crop of economic importance for the then Southern Rhodesia. Production started to peak again in 1966 and consistent production was observed until 1990 (Figure 2.2). Although an steady increase in production was noticed during the period 1966 to 1990, the number of tobacco farmers showed a negative trend (Figure 2.2).

Figure 2.2: Dynamics of tobacco industry in terms of grower population and tobacco volumes produced *(Garwe, 2018)*

According to TIMB, (2019a), the grower composition remarkably changed in the early 2000s after the Land Reform Program (LRP) which saw an exponential increase of growers from 7 937 in 2000 to 154 926 in 2019. The large-scale farms were divided into small farms and to date 85 % of the total tobacco growers registered by TIMB are small-scale.

2.1.2 Challenges facing the tobacco industry

Because of the dynamics that the tobacco industry has went through, Khumalo (2013) noted that the industry faced a number of challenges that included global health alarms, deforestation, decline in demand and climate change among other factors.

1. **World Health Organisation's Framework Convention on Tobacco Control (FCTC)**

The FCTC is a treaty of the United Nations member countries, promulgated in 2005 to curb tobacco smoking, signed by 168 countries and ratified by 182 countries (Craig *et al*., 2019; Wisdom *et al*., 2018). Figure 2.3 shows that the all countries except a few in Europe and North America had ratified the treaty by 2020. In Africa, almost all countries including Zimbabwe, have also ratified the convention. Tobacco was reported to be the leading cause of lung cancer and the proponents of the treaty believed that the economic benefits of tobacco are outweighed by the health burden it imposes (Euromonitor International, 2018).

Figure 2.3: The global WHO FCTC map showing countries which have ratified the treaty *(Source: WHO, 2020)*

To this effect, the World Health Organisation recommended some tax and legislative measures aimed at reducing the prevalence of smoking. The tax measures included the increase in tariffs on tobacco trade and the aim is to reduce the affordability of tobacco (Craig *et al*., 2019). On the other hand, the legislative measures aimed at enacting laws that reduce accessibility of tobacco by smokers. Such laws included designation of smoking zones, prohibition of advertising and increasing the legal age for smoking (Craig *et al*., 2019; Euromonitor International., 2018). In 2018, Euromonitor International (2018) reported significant drop in the number of smokers especially in European and American countries where strict measures are being implemented. Reduction in the number of smokers is directly related to a decline in the demand for tobacco and Euromonitor International (2018) recommended the intensification of

agricultural diversification as a way to spread risks and cushion tobacco farmers from possible loss of livelihoods.

2. Shortage of curing fuel due to deforestation

According to Mango *et al*., (2018) deforestation refers to the "removal of trees from a forested site and the conversion of land to another use including; agriculture, urbanisation process, illegal exploitation of forest resources for monetary gain and tremendous increase in population". There has been an increase in the exploitation of forests as the number of farmers increased and most tobacco growing regions are heavily deforested (Chapman, 1994; Chivuraise *et al.*, 2016; Khumalo, 2013; Mango *et al*., 2018). Farmers in most tobacco growing regions are travelling long distances to access wood and some have turned to use of coal; this has negatively affected the viability of the tobacco enterprise (TIMB, 2019). On the other hand, there has also been increasing pressure from environmentalist against the use of fossil fuels for curing tobacco

2.2 Theoretical Framework

Agricultural Diversification

According to Goletti (1999) and Seng (2015) agricultural diversification consists of a narrow and broader view. In a narrow view Goletti (1999) explains that farmers increase the variety of agricultural commodities produced at the farm and this is usually a response of subsistence farmers to reduce risks arising from climatic, biotic, or seasonal factors. Delgago (1997) agrees with Goletti (1999) by suggesting that diversification of this type is usually inspired by the need to avert risks and uncertainty at subsistence farming level, it is more inclined to household food security.

In a broader sense, agricultural diversification can be defined as a process of accompanying economic growth, characterized by gradual movement out of

subsistence food crops to a diversified market-oriented system. The process is usually triggered by improved rural infrastructure and rapid technological changes in agricultural production (Delgago, 1997). The broader sense, therefore, entails more than merely crop production; it embraces the entire rural economy and broadening of the income sources of rural households. Seng (2015) and Goletti (1999) agree that this diversification concept is directly linked to increasing commercialization and structural economic transformation. In this regard, such diversification will require investment in infrastructure and institutional changes to promote the private sector, particularly in rural areas.

Ellis (2000) as cited in Khumalo (2013) suggests a concept of rural livelihood diversification where rural households increase a portfolio of activities and assets to survive and improve their standards of living. The pursuit of diversification strategy as a livelihood strategy is usually divided into necessity or choice (Ellis, 2000). Necessity refers to involuntary and distress reasons for diversifying while choice is voluntary and proactive reasons for diversifying. International communities such as the World Health Organisation view as a necessity for farmers (especially those in developing countries) to diversify away from tobacco production (Khumalo, 2013). However, diversification for distress reasons is considered a bad thing as it results in household members undertaking casual and low productivity activities with poor prospects (Khumalo, 2013). Davies and Hossain (1997) in Khumalo (2013) also added that diversification for distress (necessity) may also lead to households adopting a more vulnerable livelihood system than they possessed previously. This can be substantiated by how some farmers diversified into paprika and rose production amid the Zimbabwean economic crisis in the mid- 2000s.

Diversification by choice, on the other hand, is usually inspired by several reasons such as self-insurance against risk in the context of missing insurance and credit markets as well as inability to specialize due to incomplete input markets (Esrado, 2006). Many researchers consider the risk to be the fundamental motivation for livelihood diversification and specify that the higher the perceived risk attaching to a particular income source, the more likely the household will diversify (Khumalo, 2017).

Theory of planned behaviour

According to Glanz *et al*., (2002), the theory of planned behaviour stipulates that human behaviour is influenced by their intention to perform that behaviour. Attitudes towards that behaviour, beliefs about what others think they should do, their motivation to comply with the wishes of others, and perceived behavioural control form the intention. An individual is more likely to carry out a behaviour if he/she evaluates the behaviour as beneficial and significant others approve of the behaviour (Montano & Kasprzyk, 2002). Because of environmental and contextual constraints, behavioural intention does not always lead to actual behaviour. The theory of planned behaviour does not consider such interaction effects; it traces logical sequence, yet human behaviour is not always logical.

The social cognitive theory (SCT)

The theory was postulated by Bandura in 1960 (as the Social Learning Theory) and posits that learning occurs in a social context with dynamic and reciprocal interaction of the person, environment, and behaviour. The uniqueness of the SCT is on its emphasis on social influence and its external and internal social reinforcement. The theory considers the unique way in which individuals acquire and maintain behaviour while considering the social environment in which individuals perform their

behaviours. Also, the theory considers a person's experience which determines whether behavioural action will occur. Reinforcements, expectations, and expectancies are influenced by these past experiences and shape whether people engage in a specific behaviour (Rav-Marathe & Wan, 2016)

The Knowledge, Attitude and Practice (K.A.P) Model

Postulated in the 1950s, the K.A.P model is a tool that is used to establish what is known, believed and done about a particular topic (Bano *et al*., 2013). The model was developed by Schwarts in the 1950s from the cognitive, behaviour, and affective theory and is used for cross-sectional surveys in structured interviews and questionnaires (Siltarakool, 2017; Islam, 2019). In the past, the KAP framework was restricted to population and nutrition studies but has gained popularity and relevance in the medical and agricultural fields. Gumucio *et al.* (2011) elaborated that the general procedure for the KAP survey is the same across many disciplines and the differences only emanate from the content of the questionnaire.

The KAP survey can be viewed as a quantitative method comprising of "predetermined questions and formatted standardized questionnaires (Gumucio *et al*., 2011, Oremo *et al.*, 2019). The survey is necessary for revealing the misconceptions and misunderstandings that may represent a barrier to behavioural change. Napolitano *et al*. (2019) agree by explaining that the model can also be used to unearth sociocultural or religious representations strongly linked to the change in question.

Advantages of the KAP Model

First, the KAP model has the capacity of measuring the extent of a known situation, approve or disprove a hypothesis and provide a new parenthesis of the situation's reality. For instance, Napolitano *et al*., (2019) used the model to approve the hypothesis that community pharmacists lacked awareness of antibiotic resistance and

use. Second, the model can also be used to establish a point of reference for use in future assessments. The model is ideal for before-after analysis as Mutsotso *et al*., (2011) used the model to study the impact of a project intervention on below-ground biodiversity. In addition, for policymakers, a KAP survey is useful in suggesting intervention strategies given the local circumstances and the cultural factors that influence them. Finally, Bano *et al* (2013) suggested that the model can be used to enhance knowledge, attitudes, and practices around a defined theme. It reveals what is known, felt, and done about a phenomenon.

Disadvantages of the KAP Model

Because the KAP model contains little or no open questions, it neither reveals new problems nor deepens the understanding of a situation. There usually exists a gap between what is said and what is done.

2.4 Relevance of Theoretical Frame to the study

The KAP model forms the foundation to this study in guiding how the research instruments are to be made. It also directs on interpretation of certain phenomena regarding the knowledge, attitude, and practices of the study subjects. The theory also lays out how data is to be collected and analysed and how conclusions can be drawn from the findings.

The Planned Behaviour and Social Cognitive theories are the basis from which the KAP model was developed. They help understanding why individuals behave in certain ways and how these behaviours are sustained. The theories help understanding why farmers diversify, their feelings and opinions regarding agricultural diversification. These theories help in making inference from research findings and are the basis of understanding the implications of these findings.

The agricultural diversification theory explains the subject matter of this study. Diversification is an ambiguous term and understanding the agricultural diversification model helps in streamlining the study and helps shaping up the confines of the research. The theory is critical in modelling of objectives and analysis/interpretation of data thereof.

2.5 Review of Empirical studies

Khumalo (2013) investigated how small-scale tobacco farmers are diversifying from growing tobacco. The study used qualitative methods to unearth the state of agricultural diversification amongst tobacco farmers. The field work was conducted during the peak of tobacco selling season in North and North-eastern Zimbabwe. Interviews, observations and transect walks were conducted with farmers and key informants from the Zimbabwean tobacco industry. The study found out that tobacco farmers find pride in being bona fide growers and are strongly connected to their identity. The farmers feel important in their societies and Khumalo (2013) suggested that "this could be the most important and irreplaceable reason of why they did not think of moving away from tobacco". The most compelling reason why farmers grow tobacco and not ready to diversify was that tobacco is a highly profitable and reliable source of income. The study concluded that small-scale tobacco farmers had less land to enable them to grow other cash crops, but they are already growing traditional food crops such as sorghum, groundnuts, and maize alongside tobacco. From this conclusion, the study recommended that farmers need to be involved in decision making by authorities.

Mbulukwa (2017) studied the importance of diversifying beyond tobacco in Malawi and his study focused on small-scale tobacco farmers. Malawi is one the most tobacco dependent economies in the world (Mango *et al*., 2018) and the sector is comprised

mostly of small-scale farmers. The study utilized the Simpson Index of Diversification (SID) to measure the extent of diversification for both crop and income sources. Mbulukwa (2017) did not only look at agricultural diversification but the scope of their study involved other non-agricultural income sources. The SID is a measure of diversity that accounts for the species present and their relative abundance (Sen *et al*., 2017). The index has gained popularity in some socio-economic studies (Khumalo, 2013) though Meignan *et al*. (2003) argue that the SID is more relevant when used in biodiversity studies. Ottaviano *et al*. (2003) add that the Simpson Diversity Index is more applicable in biological studies and can also be used to analyse the diversity of crops. Their argument implies that the index can be used to investigate crop diversity rather than agricultural diversification. The study by Mbulukwa (2017) utilized the index for both crop and income sources diversity. Pacheco *et al.* (2018) agreed with Mbulukwa (2017) on the application of biological indices in economics by investigating agricultural diversification using the Shannon Diversification Index. The Shannon Diversification Index is not very different in interpretation from SID. The higher the SID, the lower the diversity. On the other hand, Shannon increases as diversity increases. The two indices are more of confirmatory (Meignan *et al*., 2003). The Ordinary Least Squares regression used in Mbulukwa (2017) study concluded that age, level of education of household head, landholding size, and access to input loans positively affects diversification. On the other hand, the number of children under 12 years of age and distance to the market negatively affects diversification.

Dube (2016) analysed the degree of diversification and factors influencing crop diversification in Manicaland and Masvingo provinces of Zimbabwe. It was noted in the study that the Government of Zimbabwe with support from international institutions has invested in rural development and agricultural diversification. The goal

of such investment(s) is to improve rural household income "through improved productivity, job creation, enhanced sustainability of farm enterprises and adoption of conservation technologies". The study utilised secondary data collected from 6 districts (Nyanga, Mutasa, Mutare, Chiredzi, Zaka and Bikita) where the Agricultural Innovation Support Project has been undertaken and multi-stage random sampling approach was used in determining the study subjects. To determine the degree of crop diversification, Dube (2016) used the Herfindahl index, and the Tobit Regression model was used to evaluate factors associated with crop diversification. The Herfindahl index used in the study was defined as:

$HI = \Sigma Pi$

Where Pi is the proportion of the ith crop

$Pi = Ai / \Sigma Ai$

In which Ai = Area under ith crop and ΣAi = Total cropped area.

The study found out that households in high agricultural potential areas such as Nyanga and Bikita were the most diversified and further analysis showed that male headed households were more diversified than female-headed households. Tobit regression indicated that, "gender of household head, education, number of livestock units, access to irrigation, membership to a farmers' group, farmer to farmer extension, agroecological zone and household income are significant contributors to increasing crop diversification".

A similar study was also conducted by Dube *et al*. (2016) on factors affecting crop diversification amongst agricultural co-operators in Zambia. The study was specifically aimed at assessing the degree of crop diversification and the determinants thereof among farm households in Dundwa Agricultural Camp of Zambia. The

research was inspired by the fact that co-operators had been cultivating same crop (mainly maize) year in and year out and the need for an understanding of the co-operators' socio-economic characteristics influence on crop diversification decision making. As in Dube (2016), the Tobit regression model was also used to determine the influence of socio-economic factors on crop diversification. The model is ideal for estimating linear relationships between variables especially when there is censoring in the response variable. The Entropy Index was also used to determine the extent of diversification among the farmers. The study found out that the farming households were highly diversified with a mean entropy index of 0.88. On the other hand, the tobit regression model indicated that diversification is positively influenced by gender of household head, production of cash crops by other households and investment in basic farming implements. Contrarily, farm size, age of household head, agricultural markets access and total cultivated area negatively influenced crop diversification. Building the capacity of female headed households and investment in agricultural mechanisation were part of the recommendations of the study.

A study on the economic importance of agricultural diversification on farms by Shakya (2012) found out that diversification was one of the significant strategies that farmers use to cope with risks. It also found out that agricultural diversification also increases the profitability and sustainability of livelihoods. Seng (2015) agrees by pointing out that diversification of a farm by adopting ancillary, horticulture, and other high-value enterprises like mushroom production increases farm income.

Although numerous studies have been conducted about agricultural diversification, little has been done around diversification on tobacco farms. In particular, there is insufficient evidence of studies on the knowledge, attitude and practices of agricultural diversification by small-scale tobacco farmers. Khumalo (2013) attempted to

qualitatively explain if tobacco farmers can move away from tobacco but this approach has been debated as unsustainable. Instead, tobacco farmers must start diversifying whilst they are still growing tobacco.

2.6 Conceptual framework

Although agricultural diversification has been referenced as one of the most viable strategies in agribusiness (Dube *et al*., 2016; Khumalo, 2013; Mango *et al.*, 2018; Mbulukwa, 2017), it is influenced by a number of factors including knowledge as well as several other demographic characteristics. Gumucio *et al*. (2011) suggested an assessment of the knowledge, attitude and practice (KAP) as baseline to the understanding of a given population regarding a particular issue or concept. The KAP framework was adopted as means to effectively assess what a population knows or feels about a concept and how far they are practicing the concept. The framework is summarised in Figure 2.4

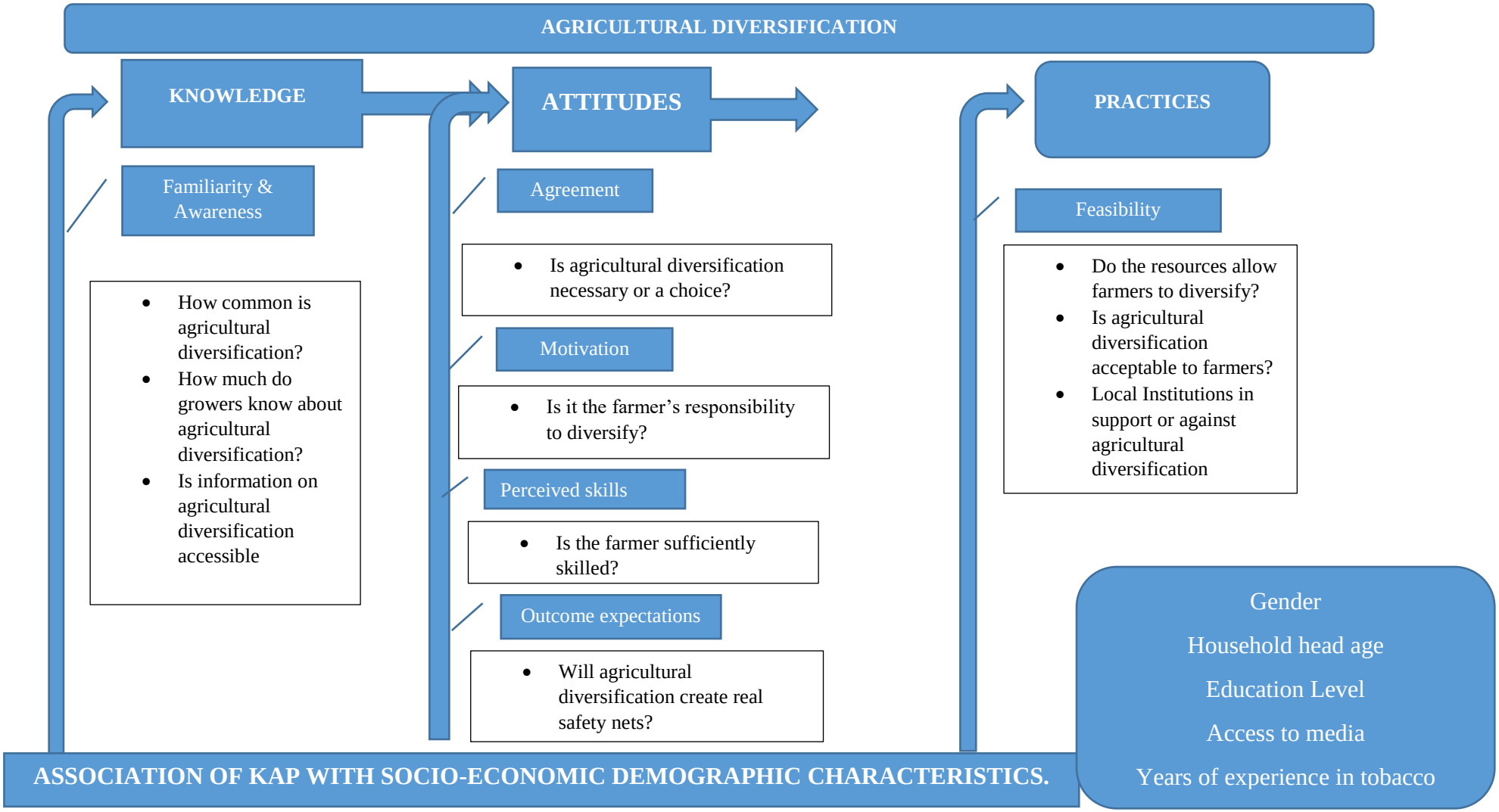


Figure 2.4: The attributes of a conceptual framework and the influence of socio-economic demographic characteristics. (Adopted from Jessiman-Perreault *et al.* (2020)

This study utilised a blend of concepts from different scholars. The KAP concept was borrowed from Gumucio *et al*. (2011), Rav-Marathe & Wan (2016) and USAID & SPRING, 2011) and described a quantitative method of assessing the state of knowledge, attitude and practices of a given population regarding a given subject. According to Rav-Marathe & Wan (2016) a KAP study cannot be comprehensive without taking the demographic characteristics of the target population into consideration. Dube (2016) and Dube *et al*. (2016) found gender, education level, and age of household head, access to media, access to extension and experience in farming as determinants of agricultural diversification.

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter details the procedure that was followed by this study. It shall cover the study design, definition of the population, sampling procedure up to the analysis and presentation of data.

3.2 The Research design

This research was a cross-sectional analytical study using data collected from a semi-structured questionnaire. The method is useful to obtain detailed information about personal feelings, perceptions, and opinions. The method also has a high response rate and allows more detailed questions to be asked (Mutsotso *et al*., 2011; Opdenakker, 2015; Islam & Billar, 2019).

3.3 Population and sampling

The study population were small-scale registered tobacco growers in Hurungwe District, Mashonaland West Province in Zimbabwe. Small-scale farmers are those farmers with not more than 10 hectares of land. In 2019, the district had 34 455 small-scale tobacco growers which are 25 % of total small-scale tobacco growers in Zimbabwe. In addition to this, approximately 22% of the total tobacco produced in Zimbabwe comes from this district (TIMB, 2019).

Sample size

The sample size of 200 participants was drawn from a population of 28 643 small-scale tobacco farmers. The sample size was calculated using Raosoft Sample Size Calculator (Raosoft, 2004) using a 95% confidence interval and 6.91% margin of error.

Sampling

Small-scale tobacco growers were selected from the TIMB Tobacco Growers Register and the research used simple random sampling to select participants from growers

register. the Random Integer Generator was used to select random numbers (Random.org, 2020).

Inclusion criteria

1. Participants must have been active registered growers and growing tobacco for at least the past two years in Hurungwe.
2. The participants must be A1 or Communal farmers.

Exclusion criteria

1. Farmers who are either under A1 or Small-Scale Commercial farms.
2. Farmers who are not in Hurungwe District
3. Farmers who are registered but have not been active for at least the past two years.

3.4 Data Collection Instruments

A semi-structured questionnaire was used to collect data in this research. The development of questions followed the Knowledge, Attitude, and Practice study guidelines (FAO, 2014; Gumucio *et al*., 2011; Napolitano *et al.*, 2019; Siltrakool, 2017; USAID & SPRING, 2011) and recommendations in survey research. The questionnaire captured what farmers know and feel about agricultural diversification as well as what they were currently doing about agricultural diversification.

Questionnaire design

The questionnaire contained interview guide questions and was divided into four sections to assess the farmers' knowledge, attitude, and practice regarding agricultural diversification.

Socio-economic demographics section

This section was developed to describe the characteristics of small-scale tobacco growers and confirm the inclusion criteria of sampling. Information about personal

background, professional experiences, educational level/qualification, size of their farms, agricultural training, annual income, and tobacco farming experience were captured.

Knowledge section

The study assessed small-scale tobacco farmer's knowledge in two topics: awareness of agricultural diversification and agricultural diversification strategies. Awareness questions evaluated whether small scale farmers had any knowledge of agricultural diversification and the agricultural diversification strategies section probed the strategies that farmers were using.

Attitude section

The section examined small scale farmers' agreement with agricultural diversification statements and their keenness to learn and adopt it in their farming programs.

Practices section

Farmers' current actions on agricultural diversification according to their knowledge and attitudes. This section consisted of questions that probed the actions that small-scale tobacco farmers were practicing regarding agricultural diversification. The section had close-ended and a few open-ended questions.

3.5 Data Collection Procedure

The data were collected through questionnaire interviews. Pre-survey meetings were arranged to train research assistants on how to interpret the predetermined and structured questionnaires. All the farmers were asked the same set of questions and their responses were allotted to specified response categories. The farmers where interviewed in the comfort of their homes or where they deemed fit. Periodic meetings were organised to review progress and assess the challenges that research assistants faced when interviewing farmers. The research also utilised an opportunity to

interview walk-in farmers at TIMB Karoi office who would have come for grower certificate renewal, submission of crop returns and other technical issues. The collection of data was manual, and all the responses were captured in Microsoft Excel spreadsheets upon conclusion of the data collection exercise.

3.6 Analysis and organisation of data

The variables of this study were socio-economic demographic characteristics, knowledge, attitudes, and practices of agricultural diversification by participants. The study also explored factors affecting knowledge, attitude and practice of agricultural diversification by small-scale tobacco farmers.

Demographic characteristics

This was analysed through descriptive statistics to establish the distribution of the population. Measures of central tendency; mean, mode, and median were also used.

Knowledge of participants

Knowledge was measured on a 10 items scale; participants scoring above the median were categorized as having good knowledge and those with a score lower than the median were classified as having poor knowledge. Numerical data on knowledge was converted into categorical data to facilitate bivariate analysis. A Tobit Regression was performed to ascertain factors influencing knowledge.

Model specification:

$$KSCORE = \beta 0 + \beta 1(\text{gender}) + \beta 2\ (\text{education level}) + \beta 3\ (\text{extension}) + \beta 4\ (\text{age}) + \beta 5\ (\text{experience}) + \beta 6\ (\text{media access})$$

Table 3.1: Description of Tobit Regression variables

Variable	Definition	Measurement	Apriori assumption
Dependant Variable			
KSCORE	Whether the farmer has the knowledge of agricultural diversification	Percent score	
Explanatory variables			
Age	The age of household head	Dummy: 1= below 45, 0 otherwise	-
Gender	The sex of household head	Dummy: 1= male, 0= otherwise	-/+
Experience	Number of years farming tobacco	Dummy: 1= 3 years & below, 0= otherwise	-
Education Level	The level of education of the household head	Dummy: 1= primary & below, 0= otherwise	+
Media Access	Access to radio, television, smartphone, or press	Dummy: 1= yes, 0= otherwise	+
Extension access	Whether the farmer is getting training and other extension support	Dummy: 1= yes, 0= otherwise	+

Attitudes of participants

The attitude of small-scale tobacco farmers towards agricultural diversification was measured on an ordinal scale of 5. This section had both negative and positive statements that help understanding farmers' mental affiliation about agricultural diversification.

Table 3.2: Attitude scoring matrix

Score	Meaning
1	Strongly disagree
2	Disagree
3	Undecided
4	Agree
5	Strongly agree

The possible score range was 20-100 where 20 implies a highly negative attitude and 100 implied a highly positive attitude. Farmers with below-median score had negative attitude while those with above median score had a positive attitude. The extent of attitude was then determined by using the Attitude Score (AS) and Attitude Index (AI).

$AS = (N_1 \times 1) + (N_2 \times 2) + (N_3 \times 3) + (N_4 \times 4) + (N_5 \times 5)$

Where,

AS = Attitude Score

N_1 = Number of respondents who strongly disagreed

N_2 = Number of respondents who disagreed

N_3 = Number of undecided respondents

N_4 = Number of respondents who agreed

N_5 = Number of respondents who strongly agreed

$$\text{Attitude Index} = \frac{\text{Observed score}}{\text{Possible highest score}} \text{ x } 100$$

A binary logistic regression analysis was also performed to determine factors affecting the attitude of small-scale farmers towards agricultural diversification

Model specification

$$ATTSCORE = \beta 0 + \beta 1(\text{gender}) + \beta 2\ (\text{education level}) + \beta 3\ (\text{extension}) + \beta 4\ (\text{age}) + \beta 5\ (\text{experience}) + \beta 6\ (\text{media access})$$

Table 3.3: Description of Binary Logistic Regression variables

Variable	**Definition**	**Measurement**	**Apriori assumption**
Dependant Variable			
ATTSCORE	Whether the farmer has the knowledge of agricultural diversification	Percent score	
Explanatory variables			
Age	The age of household head	Dummy: 1= below 45, 0 otherwise	-

Gender	The sex of household head	Dummy: 1= male, 0= otherwise	-/+
Experience	Number of years farming tobacco	Dummy: 1= 3 years & below, 0= otherwise	-
Education Level	The level of education of the household head	Dummy: 1= primary & below, 0= otherwise	+
Media Access	Access to radio, television, smartphone, or press	Dummy: 1= yes, 0= otherwise	+
Extension access	Whether the farmer is getting training and other extension support	Dummy: 1= yes, 0= otherwise	+

Practices of participants

The practices were rated on a 9-item scale where those with a score above median classified as having good practices and those with below-median scores classified as having poor practice. Numerical data on practices was converted into categorical data to facilitate bivariate analysis. Chi-square was used to investigate the association between practices and the independent variables that is the socio-demographic characteristics of farmers.

Influence of knowledge, attitude and socio-economic characteristics on the practice of agricultural diversification

The study utilized a non-conditional multiple logistic regression model to determine the influence of selected socio-economic demographic characteristics, knowledge and attitude on the practice of agricultural diversification by small-scale farmers.

Model Specification

$$Agric.Div = \beta 0 + \beta 1(\text{experience}) + \beta 2\ (\text{education level}) + \beta 3\ (\text{extension}) + \beta 4\ (\text{knowledge}) + \beta 5\ (\text{attitude}) + \beta 6\ (\text{media access}) + \beta 7\ (\text{gender}) + \beta 8\ (\text{age})$$

Table 3.4: Description of variables (Binary Logistic Regression model)

Variable	Definition	Measurement	Apriori assumption
Dependant Variable			
Agric.Div	Household growing at least one crop other than tobacco or rearing livestock at the same time growing tobacco	Dummy: 1= practicing, 0= otherwise	
Explanatory variables			
Age	The age of household head	Dummy: 1= below 45, 0 otherwise	-
Gender	The sex of household head	Dummy: 1= male, 0= otherwise	-/+
Experience	Number of years farming tobacco	Dummy: 1= 3 years & below, 0= otherwise	-
Education Level	The level of education of the household head	Dummy: 1= primary & below, 0= otherwise	+
Media Access	Access to radio, television, smartphone, or press	Dummy: 1= yes, 0= otherwise	+
Extension access	Whether the farmer is getting training and other extension support	Dummy: 1= yes, 0= otherwise	+
Knowledge	Whether the farmer has the knowledge of agricultural diversification	Percent score	+
Attitude	Farmers' perception on agricultural diversification	Percent score	+

This model was derived from the findings of Dube (2016) and Sichoongwe (2014) that identified gender of household head, education level of household head,farming experience, access to extension as factors influencing agricultural diversification. The apriori assumptions were derived from Dube *et al*. (2016) and Dube (2016) who found gender of household head, education level, media and extension access to be positively influencing the practice of agricultural diversification. On the other hand, age of household head and experience in farming were found as negatively influencing agricultural diversification. In their study of pharmacists' practices, Napolitano *et al*.

(2019) and Siltrakool (2017) concurred that knowledge and attitude are positive influencers of practice. Experience is expected to be negatively related to agricultural diversification; the more the farmers enjoy money from tobacco, the less they are likely to diversify their farm production

Data Analysis Tools

The Statistical Package for Social Sciences (SPSS) version 25, Stata Version 15 and Microsoft Excel 365 were used for analysing quantitative data.

Methodological limitations

The methods outlined in this research were limited by the disparities which existed between what the farmers said and reality. The disparities arose due to farmers' inability to recall historical data and low response rates. The questionnaire had cross-reference questions that will ask the same things differently as a strategy to address the disparities. Gumucio *et al*., (2011) elaborated that a KAP questionnaire should be administered by people who have knowledge and understanding of the culture and beliefs of the target population. The interviews were conducted with the assistance of resident Field Officers who understood the culture and beliefs of the target population

3.7 Ethical Considerations

The proposal for this study was sent for evaluation and consideration by the Africa University Research Ethics Committee (AUREC) and approval of the committee was sought before data collection commenced. The study ensured adherence to the following ethical considerations:

Confidentiality

The research did not collect any personal information including specific location of the farmers. All the specific responses of the farmers were not shared with third parties.

Informed Consent

The research objectives were explained to farmers and no farmer was coerced into answering interview questions. The research sought the farmers permission and where denied, the farmer was given freedom to leave.

The Potential for Harm

No potential of harm was associated with this research. Where farmers felt threatened, the research gave the farmers room to decline answering or stop the process immediately.

Public Health

The research was contacted during the period of Covid-19 pandemic. Virtual interviews were not possible as most of the farmers do not have internet infrastructure. The study therefore resorted to face-to-face interviews where the World Health Organisation's Covid-19 Prevention Protocols like wearing of masks, washing of hands and social distancing were religiously observed.

CHAPTER 4 DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of this research. The presentations shall be in the form of charts, figures and tables. In this chapter, data analysis is also included where inference shall be drawn from the research findings. The statistical information contained in the table, figures and charts will be interpreted and simplified.

4.2 Data Presentation and Analysis

4.2.1 Socio-Economic and Demographic characteristics of small-scale tobacco farmers

The thrust of the socio-economic demographic characteristics was centred on farmers' gender, farmers age, number of economically active members of a household, education level, access to extension and media, farm size, and their tobacco growing experience.

4.2.1a Household head gender characteristics of small-scale tobacco farmers

The study indicated that 67% of small-scale tobacco farming households in Hurungwe is male headed (Table 4.1). Less than a third of the household were headed by women.

Table 4.1: Gender of household heads (N=158)

Gender	Percent of study population
Male	67
Female	33
Total	**158**

4.2.1b Household head age characteristics of small-scale tobacco farmers

Seventy-three percent of the household heads are aged above 45 years and above compared to twenty-seven percent who are below the age of 45 (Figure 4.1). Forty one

percent of all the small scale tobacco household heads were at least 55 years of age. Young people below the age of 35 constituted only five percent. In terms of distribution, the majority of farmers were at least forty five years of age.

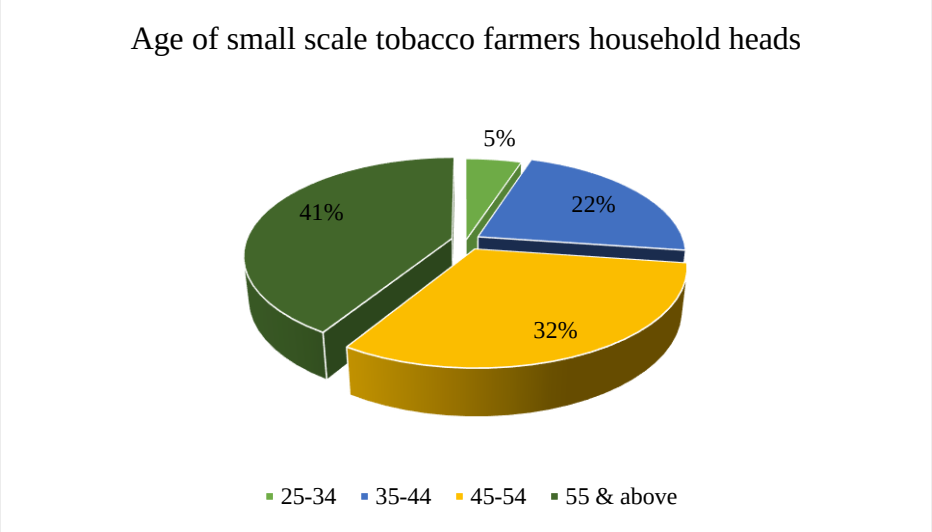


Figure 4.1: Age of small-scale tobacco farming household heads (N=158)

4.2.1c Small-scale tobacco farmers' tobacco farming experience

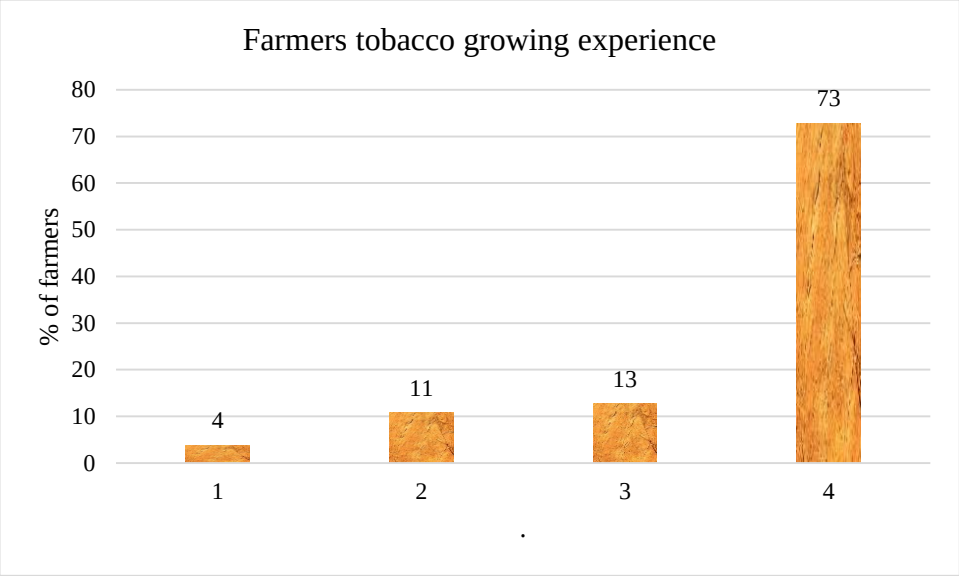


Figure 4.2: Household heads tobacco farming experience (N=158)

As shown in Figure 4.2, seventy-three percent of the farmers had been growing tobacco for at least four years and only four percent had one year of tobacco growing experience. Overall, there are a few new entrants in small-scale tobacco farming.

4.2.1d Small-scale tobacco farmers' education characteristics

Table 4.2: Education level of household heads (N=158)

Education Level	Number of farmers	Percent
Above primary	124	78.5
Primary & Below	34	21.5
Total	158	100.0

Of the 158 interviewed small-scale tobacco farmers, seventy-nine percent had reached at least secondary level and twenty-one percent had at most primary school level (Table 4.2).

4.2.1e Small-scale tobacco farmers' access to media

Table 4.3: Household heads' access to media (N=158)

Access to Media	Frequency	Percent
No	35	22
Yes	123	78
Total	**158**	**100**

The majority of farmers (78%) had access to either a radio, newspaper, magazine or social media whilst twenty two percent of the farmers had no access to any form of media (Table 4.3).

4.2.1f Small-scale tobacco farmers' access to extension services

Sixty six percent of the farmers had access to extension services through government extension officers or officers from tobacco contracting companies (Table 4.4). On the

other hand, thirty four percent indicated that they do not have access to neither government nor tobacco contracting company extension officers.

Table 4.4: Household heads' access to extension services (N=158)

Access to Extension	Frequency	Percent
No	53	34
Yes	105	66
Total	**158**	**100**

4.2.2 Small-scale tobacco farmers' knowledge about agricultural diversification

The distribution of knowledge scores showed a normal distribution with a mean score of 34.68 (Figure 4.3). However, the distribution was slightly skewed to the left implying that most farmers had a score less fifty percent.

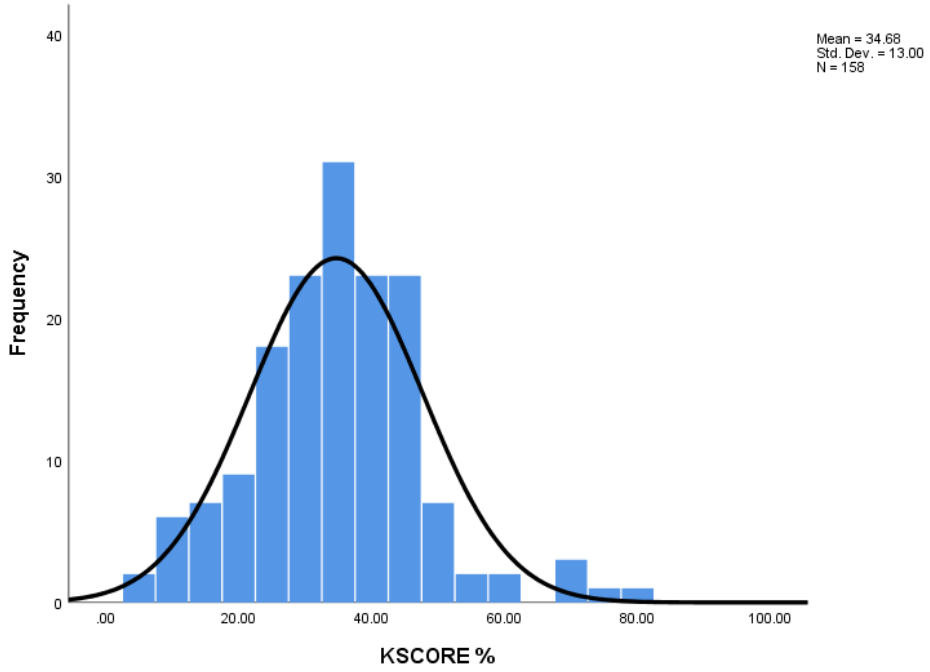


Figure 4.3: Distribution of household heads' knowledge scores (N=158)

According to Figure 4.5, more men (71%) had good knowledge about agricultural diversification as compared to women (29%). Ironically, gender did not show a significant influence on knowledge (p=0.814> p=0.05) (Table 4.6). On the other

hand, seventy five percent of the farmers with good knowledge about agricultural diversification were at least forty five years of age.

Table 4.5: Interaction of knowledge by age and gender (N= 158)

Age (years)	Percent Household		
	Poor knowledge (n=65)	**Good knowledge (n=93)**	**Total (n=158)**
45 and above	69	75	73
Below 45	31	25	27
Gender			
Female	39	29	33
Male	61	71	67

Apart from gender, farmer's age (p=0.967), education level (p=0.144) and tobacco growing experience (p=0.412) also showed an insignificant influence on their knowledge. On the other hand, both access to media (p=0.015) and extension (p=0.002) significantly influenced farmer's knowledge.

Table 4.6: Tobit regression estimates of factors influencing knowledge of household heads (N=158)

KSCORE	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Gender	-0.493	2.089	-0.240	0.814	-4.621	3.634
Age_cont	-0.003	0.083	-0.040	0.967	-0.167	0.160
Edu_Rec	-3.480	2.368	-1.470	0.144	-8.158	1.199
AccesstoExtension	5.192	2.103	2.470	0.015**	1.037	9.347
Media_Access	7.859	2.477	3.170	0.002***	2.966	12.753
Experience_yrs	0.242	0.294	0.820	0.412	-0.339	0.822
_cons	24.784	5.047	4.910	0.000	14.812	34.756
var(e.KSCORE)	143.027	16.092			114.520	178.630

Note:
*** indicates that the coefficient is significant at 1% significance level
** indicates that the coefficient is significant at 5% significance level

An analysis of the interaction of educational level by knowledge score showed that the majority (80%) of farmers who had good knowledge had at least attained secondary

education. Contrarily, those with primary education and below constituted twenty percent of farmers with good knowledge (Table 4.8).

Table 4.7: Education level by knowledge interaction (N= 158)

Education Level	Percent Household Poor knowledge (n=65)	Good knowledge (n=93)	Total (n=158)
Above Primary	77	80	79
Primary & below	23	20	22

4.2.3 Small-scale tobacco farmers' attitude about agricultural diversification

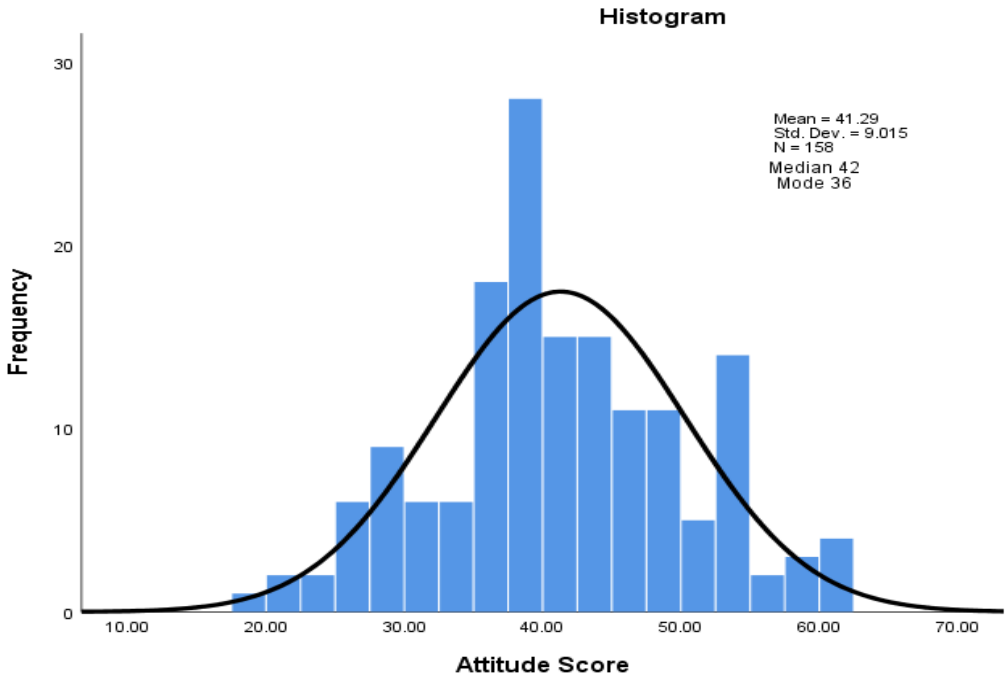


Figure 4.4: Distribution of household heads attitude scores (N=158)

The farmers scored poorly generally as the highest score was 62% against a target of 100. The median score was 42 and the distribution was skewed towards negative attitude. The average attitude score was 374 against a target of 790 and the attitude index (AI) was 0.47 against a target of 1. Further analysis through binary logistic regression showed that media access and tobacco growing experience are significant contributors to attitude of farmers towards agricultural diversification (Table 4.9).

Table 4.8: Binary logistic regression estimates of factors influencing the attitude of farmers (N= 158)

ATTSTATUS	Odds Ratio	Std. Err.	Z	P>z	[95% Conf.	Interval]
Gender	0.859	0.332	-0.390	0.694	0.402	1.832
Age_cont	0.999	0.015	-0.090	0.929	0.969	1.029
Edu_Rec	0.879	0.386	-0.290	0.769	0.371	2.080
AccesstoExtension	0.730	0.283	-0.810	0.417	0.341	1.562
Media_Access	0.234	0.117	-2.920	0.004***	0.088	0.621
Experience	-0.208	0.057	13.360	0.000***	-0.305	0.812
_cons	3.450	3.374	1.270	0.205	0.507	23.454

Note: *** indicates that the odds ratio is statistically significant at 1%

On the other hand, gender (p=0.694), age (p=0.929), educational level (p=0.769) and access to extension (p=0.417) were not significant at both 5% and 10% level of significance.

4.2.4 Factors influencing practice of agricultural diversification by small-scale tobacco farmers

Fifty-seven percent of small-scale tobacco farmers in Hurungwe district indicated that they are already diversifying (Figure 4.5). However, the scale of diversification is at a subsistence level. Forty three percent of the farmers indicated that they were only growing tobacco as source of household income.

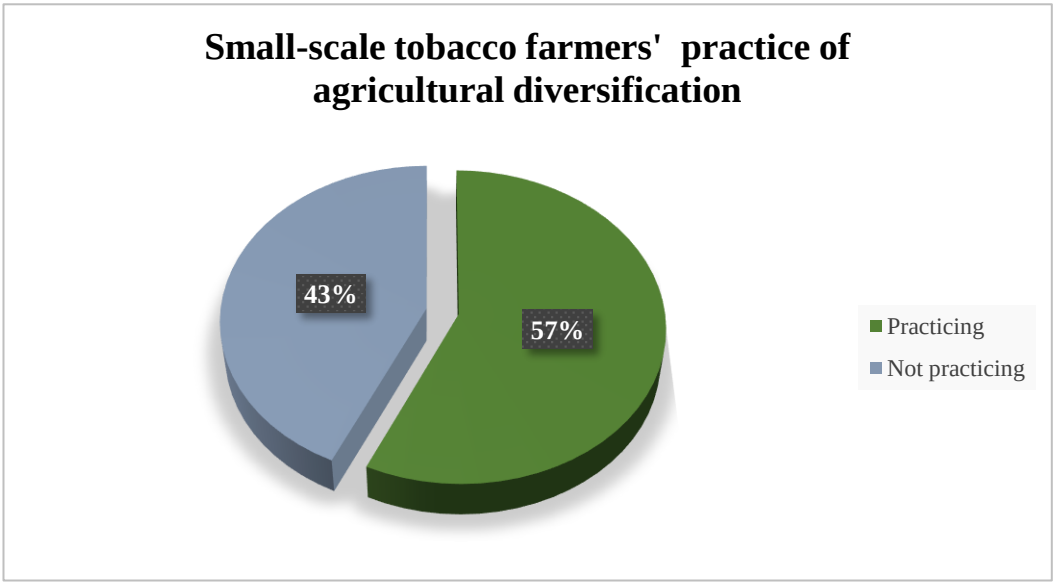


Figure 4.5: Proportion of household heads practicing agricultural diversification (N= 158)

Table 4.10 shows the estimates of the binary logistic regression used in this study. The variables that significantly influence the practice of agricultural diversification by farmers are attitude (ATTSCORE), knowledge (KSCORE), education level (Edu_rec), farm size (FarmSize) and media access (Media_Access). Contrarily, gender (Gender), Age of household head (Age_cont), Household size (HHSize), number of economically active people (HHEconomic~e), access to extension (AccesstoEx~n), drought power (DroughtPower) and tobacco growing experience (Experience~s) did not significantly influence practice of agricultural diversification.

Table 4.9: Binary logistic regression estimates of factors influencing practice of agricultural diversification (N= 158)

PRACTICEST~E	Odds Ratio	Std. Err.	Z	P>z	[95% Conf.	Interval]
Gender	0.614	0.294	-1.020	0.309	0.240	1.571
Age_cont	0.985	0.020	-0.760	0.450	0.946	1.025
HHSize	1.168	0.152	1.190	0.233	0.905	1.508
Edu_Rec	0.306	0.177	-2.050	0.041**	0.099	0.951
HHEconomic~e	1.090	0.180	0.520	0.600	0.790	1.506
AccesstoEx~n	1.349	0.614	0.660	0.511	0.553	3.293
Media_Access	1.770	1.016	-1.000	0.094*	0.575	5.452
FarmSize	1.393	0.171	2.710	0.007***	1.096	1.771
DroughtPower	0.317	0.318	-1.150	0.251	0.045	2.257

ATTSCORE	0.933	0.026	-2.500	0.012**	0.884	0.985
KSCORE	1.101	0.027	3.890	0.000***	1.049	1.156
Experience~s	1.013	0.067	0.190	0.849	0.890	1.152
_cons	0.255	0.587	-0.590	0.553	0.003	23.174

Note:
***Indicates that the coefficient is significant at 1%
**Indicates that the coefficient is significant at 5%
*Indicates that the coefficient is significant at 10%

4.3 Discussion and interpretation

4.3.1 Socio-economic demographic characteristics

Similar to the findingds of this study, Dube (2016) also noted that the majority of farming communities in Manicaland and Masvingo are male-headed. Besides, patriarchy is still dominant in most rural Africa hence men lead in decision making regarding investments in household (Parpart, 2005).

Seventy-three percent of the household heads are aged above 45 years and above compared to twenty-seven percent who are below the age of 45 (Figure 4.1). Dube *et al*. (2016) reported most household heads in Manicaland and Masvingo being above 50 years of age. Age is a critical factor in determining farming decisions and ultimate farm production/ productivity. The interviewed farmers are beneficiaries of the land reform program and former employees of white farmers in Hurungwe hence most of the household heads are old. Mishraand El-Osta (2002) as cited by Dube *et al.* (2016) suggested that older farmers are less versatile and less likely to diversify.

Seventy-three percent of the farmers had been growing tobacco for more than three years whilst twenty-seven percent were new entrants to tobacco production (Figure 4.1). Khumalo (2013) and TIMB (2019) reported that Hurungwe is the largest tobacco growing district in Zimbabwe and farmers have been growing tobacco for decades hence it is expected to have the majority being experienced farmers. Kersten *et al.* (2014) explained that experience influences individual perceptions towards a subject.

From this view, it can be expected that the more experienced the farmer is, the less likely they are to diversify.

Of the 158 interviewed small-scale tobacco farmers, seventy-nine percent had reached at least secondary level and twenty-one percent had at most primary school level (Table 4.2). Dube (2016) reported that higher education increases the probability of diversifying. Although, most farmers in this study had reached secondary school level, they indicated that they did not reach Form 4. The fact that the majority of the small-scale farmers had at least attended secondary school is enough evidence that the literacy level of the farmers is fair. The more the farmers gets educated, the more knowledge they gain and the more likely they are to make constructive decisions (Sichoongwe, 2014).

Media has an effect of spreading information and have long been used as an agricultural information dissemination tool (Table 4.3). Nazari & Hasbullah (2010) denoted that, “the radio is a powerful communication tool. It has proved to be the most effective media in promoting agriculture and developments in rural areas, particularly as a tool for the delivery of quick information”. Seventy-seven percent of the farmers indicated that they had access to at least a radio, magazine or mobile telephone and twenty-two percent had access to none of the media tools. This implies that the dissemination of agricultural diversification information is feasible and effective. Akwiwu & Patrick (2020) also reiterated that media is one of the most effective tools in agricultural information dissemination. The state of media access of small-scale tobacco farmers is favorable and can be used as an advantage by policy makers to communicate agricultural policy issues with the farmers. Small-scale tobacco farmers in Hurungwe access extension services through Extension Officers from government and tobacco contracting companies (Table 4.4). The farmers indicated that the most

frequent farm visits were done by tobacco contractors' extension officers while government extension officers visit occasionally

As illustrated in Table 6, sixty-six percent of the farmers had access to extension and thirty-four percent had no access. These results are contrary to the findings of Chitongo (2017) who reported inaccessible extension services by small scale tobacco farmers in Zimbabwe. He reiterated that government extension officers are incapacitated to do frequent farm visits. This research also observed that much of the extension services are accessed from tobacco contractors. The findings of this research imply that much of the training content is tobacco based hence, it can be difficult for the tobacco farmers to switch to other crops. Mutandwa *et al*. (2008) as cited by Chitongo (2017) espoused that training improves farm outcomes and enables smallholder farmers to produce better quality crops and yield compared to untrained farmers. As stated by TIMB (2019), Hurungwe produces the best quality "lemon styled" tobacco which fetch high prices. This can be a justifiable reason why small-scale tobacco farmers can be hesitant to try other agricultural enterprises. However, the modification of training strategy to include agricultural diversification can change the perception, knowledge, and practices of tobacco farmers.

4.3.2 Small-scale tobacco farmers' knowledge about agricultural diversification

Knowledge is a critical component and factor in shaping behaviour of a community or individuals. Figure 4.3 shows that the total knowledge score of small-scale tobacco farmers ranged from 5% to 80%, with an average knowledge score of 35% (±13%). The median score was 35% and fifty-nine percent of the small-scale tobacco farmers scored above median. This implies that the fifty-nine percent were knowledgeable about agricultural diversification whilst forty-one percent had poor knowledge about agricultural diversification. However, the size of the median is too low to warrant a

conclusion that indeed, the farmers had good knowledge of agricultural diversification.

Seventy-one percent of the farmers who were judged as having good knowledge about agricultural diversification were male whilst twenty-nine percent were female (Table 4.5). From the findings of Runhare and Gordon (2004) that women had less access to education, this result is expected. There is generally male dominance in decision making in farming households of Zimbabwe and the girl child is usually overwhelmed with household chores and deprived of a chance to go to school. In a different study and area, Siltrakool (2017) reported higher knowledge about antimicrobial resistance in female than male pharmacists.

A Tobit regression analysis showed that media and extension access significantly influence the knowledge of the household heads (Table 4.6). Access of media would lead to a 7.8% increase in knowledge whilst access to extension leads to 5.2% increase in knowledge. Media and extension have the same effect of enhancing knowledge of farmers about a given subject as reported by Akwiwu & Patrick (2020), Mavrodieva *et al*. (2019) and Nazari & Hasbullah (2010).

Nazari & Hasbullah (2010) noted that, "educational intervention through radio caused significant knowledge enhancement from 3.99 to 6.41 of a total of 10, clearly indicating the effective role of radio to improve awareness of farmers". Also, the World Bank reiterates that media successfully created media bridges to sensitise farmers on the importance of agricultural diversification. In the case of the Peruvian Sierra Exportadora Crop Diversification Program, communication platforms acted as channels through which farmers shared their challenges, doubts, and concerns (World Bank, 2017). Such channels provided an opportunity for farmers to learn from the experience of fellow farmers; a concept similar to Dube (2017)'s farmer to farmer

extension. Extension is also an important tool in enhancing farmers' knowledge. Dube (2016) and Dube *et al.* (2016) indicates the importance of extension in enhancing the knowledge and ultimate practice of agricultural diversification. In particular, Dube (2017) commented that extension can counter balance the negative effects of lack of formal education and found out that farmer-to-farmer extension was a significant contributor to knowledge and practice of agricultural technologies.

Although age was not significant in influencing farmers' knowledge, Table 4.7 shows that older household heads (75%) had knowledge about agricultural diversification than their younger counterparts. This is possibly because the older household heads had more experience in farming and have attended numerous farmer trainings. Siltrakool (2017) testified that knowledge and experience are strongly correlated.

Regression analysis also showed that education level was not a significant contributor to knowledge of small-scale tobacco farmers (Table 4.8). However, past studies have shown a strong correlation between education level and general knowledge (Siltrakool, 2017). In this study, eighty percent of the farmers who had knowledge about agricultural diversification had attained at least secondary education. This also relates to higher literacy level and intellectual capacity that is usually associated with an increase in education level (Mbulukwa, 2017)

4.3.3 Small-scale tobacco farmers' attitude about agricultural diversification

The farmers generally scored poorly as the highest score was 62% against a target of 100. The median score was 42 and the distribution was skewed towards negative attitude. The average attitude score was 374 against a target of 790 and the attitude index (AI) was 0.47 against a target of 1. In principle the closer the AI to 1, the more positive the farmers' attitude is towards agricultural diversification and vice versa. Although the overall AI of this study showed negativity of farmers towards agricultural

diversification, farmers agreed in principle that it is not difficult to run other enterprises with tobacco (AI=0.6) and that tobacco proceeds can be channelled to other enterprises (AI=0.63). Further analysis through binary logistic regression showed that media access and tobacco growing experience are significant contributors to attitude of farmers towards agricultural diversification (Table 4.9).

Mavrodieva *et al* (2019) underlines the importance of media and agrees to the findings of this study by specifying that media changes public perception. Media could have the same effect as extension because the information shared on media platforms is usually developed through extension work and field experts. This study reports that sixty-five percent of the farmers with positive attitude had access to media.

Tobacco growing experience was also significant, but it negatively influenced the attitude of tobacco farmers towards agricultural diversification. Interestingly, eighty-seven percent of the farmers with negative attitude had more than three years of tobacco farming experience. Aru *et al*. (2016) attempted to explain the phenomena by stressing out that previous experience shapes the way human beings perceive the world around them. This implies that, the longer a farmer is involved in tobacco production and enjoying profits from sale of tobacco, the less likely he is to perceive anything outside tobacco as good. Khumalo (2013) affirms this result by arguing that farmers' attitude may be a result of fear of losing their identity.

Although access to extension was not significant, sixty-one percent of the farmers with access to extension services had a positive attitude towards agricultural diversification. The magnitude of the proportion of farmers with access to extension (67%) is not in proportion with the attitude status of the farmers. This implies that information shared by extension officers lacks agricultural diversification content. Dube (2016) reported that farmers with access to extension are more likely to adopt crop diversification

compared to those who do not receive routine training. However, Hurungwe is different in that the most frequent farm visits and trainings are done by tobacco technicians whose focus is tobacco agronomy, input distribution and debt recovery. Thus, farmers are in most of the cases informed about tobacco production techniques, receiving tobacco inputs and how to repay the loans.

4.3.4 Factors influencing practice of agricultural diversification by small-scale tobacco farmers

Fifty-seven percent of small-scale tobacco farmers in Hurungwe district indicated that they are already diversifying (Figure 4.5). However, the scale of diversification is at a subsistence level. This is supported by Khumalo (2013) and Sichoongwe (2014) who pointed out that agricultural diversification had been happening at subsistence in small-scale tobacco farming communities. Small-scale tobacco farmers have been growing other crops as part of their tradition, but these crops are in most of the cases neglected during the peak season of tobacco cultivation (Khumalo, 2013). Some farmers are growing tobacco only and buy maize using tobacco proceeds.

Table 4.10 shows the estimates of the binary logistic regression used in this study. The variables that significantly influence the practice of agricultural diversification by farmers are attitude (ATTSCORE), knowledge (KSCORE), education level (Edu_rec), farm size (FarmSize) and media access (Media_Access). Contrarily, gender (Gender), Age of household head (Age_cont), Household size (HHSize), number of economically active people (HHEconomic~e), access to extension (AccesstoEx~n), drought power (DroughtPower) and tobacco growing experience (Experience~s) did not significantly influence practice of agricultural diversification.

Small-scale tobacco farmers with access to media are more likely to practice agricultural diversification than those with no access. For a farmer with access to media, the odds of a household practicing agricultural diversification are 1.77 higher

and statistically significant at 10% level of significance when compared to farmers with no access to any form of media. This finding agrees with Akwiwu & Patrick (2020), Mavrodieva *et al*. (2019) and Nazari & Hasbullah (2010) who emphasised the importance of media in changing the behaviour of farmers and improving agricultural development. Nazari & Hasbullah (2010) specifies that the radio is efficient and quick in disseminating agricultural information. Most farmers with access to media mentioned that they religiously followed agricultural programs on radio and were also members of certain agricultural groupings on social media.

Most companies in Zimbabwe, are now using Short Message Service (SMS) platform to send marketing materials and tips to farmers (Mugwisi, 2015). There is, nevertheless, a mismatch between farmers with access to media and those practicing agricultural diversification that is, the proportion of farmers with access to media is higher than those practicing agricultural diversification. Mugwisi (2015) explains the phenomena by emphasising the importance of timing of programs with agricultural content and audience availability. This implies that there is need to understand the routine of farmers, for example, airing the program in the afternoon or evening when farmers are resting. Also, Mwalusaka (2013), as cited by Mugwisi (2015) posits that the information must be in synchrony with the farming seasons for it to be relevant.

The importance of knowledge of principles and facts of agricultural diversification in determining whether a farmer practices agricultural diversification cannot be overemphasised. In this study, knowledge was significant at 1% level of significance and one percentile increase in knowledge increases the odds of practicing agricultural diversification by 1.101. In fact, being knowledgeable about agricultural diversification increases the odds of practicing by a factor of 1.1 as compared to those without the knowledge. In a related study, Siltrakool (2017) reported that pharmacists

with knowledge in antibiotic resistance had higher odds of dispensing the drugs correctly. Knowledge has an effect of increasing confidence in executing certain farm operations and increases efficiency. For agricultural development to occur, Akwiwu & Patrick (2020) and Nazari & Hasbullah (2010) agreed that knowledge has to be comprehensive and not leave wide information gaps. Because the knowledge of farmers is still patchy, training them may significantly increase the odds of practising agricultural diversification by larger margins.

Education is key to the practice of agricultural diversification. This study finds that farmers with at least secondary education are at odds 0.31 higher than those with primary education and below. Although most of the farmers indicated that they did not finish secondary education, reaching this education level improved their literacy and intellectual capacity. This implies that the farmers can understand information on media platforms as well as that which is given to them by extension officers. Dube (2016) support this finding by reiterating that every addition of a farmer with secondary education would lead to a corresponding increase in probability of practicing agricultural diversification by 2.3%. In addition, this finding concurs with other studies by Bravo *et al*. (2006) and Ashfaq *et al*. (2008) who found out that education and training better prepare farmers to run diversified farms.

This study also found attitude of farmers to be a significant influencer of decisions of whether to diversify. Attitude was significant at 5% significance level and a percentile increase in attitude score would lead to a corresponding 0.933 likelihood of farmers to diversify. Olorunfemi *et al*. (2016) also admitted that a negative attitude results in lower morale in providing "parental influence, motivation and encouragement" towards an agricultural development issue, diversification included. Coupled with negative attitudes, the older people (who constituted most of the population) may not

be able to encourage their children to try new things unless otherwise a comprehensive policy is put in place.

Agricultural diversification would require bigger portions of land (Dube *et al.,* 2016) and farm size becomes a critical determinant of farmers' ability to diversify. In this study, an increase in farm size was found to increase agricultural diversification. An additional hectare of land would lead to an increase in odds of diversifying by 1.393. Makate *et al*. (2016) and Pope & Prescott (1980) affirm with this finding by stating that increasing farm size led to an increase in the possibility of diversification. Small-scale farmers are limited to small livestock (chickens, rabbits, goats) production or they must invest heavily in intensive production methods such as pen fattening of cattle. The farms varied from 2 hectares to 10 hectares and most of those with land area above 6 hectares had at least another enterprise outside tobacco farming. However, Mishra *et al*. (2004) argued that, the larger a farm is, the more specialised it become.

Access to extension was found not to influence agricultural diversification significantly. This is contrary to the findings of Dube *et al*. (2016) who reported that access to extension had a positive influence on diversification. Mbulukwa (2017) and Sichoongwe (2014) had similar findings to Dube *et al.* (2016). This finding is divergent from previous studies findings, but it is not far-fetched as farmers in Hurungwe get extension services from tobacco contractors. Many farmers reported that the most frequent on-farm trainings are conducted by extension officers from tobacco companies and their main thrust is tobacco agronomy, handling, quality assurance and debt recovery. This implies that the farmers may only get agricultural diversification training from government extension workers who do not visit their farms as frequent as their counterparts.

4.4 Summary

This chapter presented and discussed the findings of this study. It explored the demographic characteristics of the Hurungwe small-scale tobacco farming community and explained the state of and variation in knowledge, attitude and practice of agricultural diversification. The main tools used in the chapter include Binary Logistic Regression, Tobit Regression, and descriptive statistics. The results showed that the attitude of farmers is negative, knowledge is fair, and practice is still marginal (mostly subsistence level). Knowledge and attitude are affected by access to media and extension while practice of agricultural diversification is influenced by access to media, farm size, educational level, knowledge, and attitude.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.1 Introduction

The previous chapter presented and interpreted the findings of this study. This chapter follows by presenting summary, conclusion and recommendations based on the reviewed literature and findings of this study. The chapter shall also recommend areas for further and future studies.

5.2 Discussion

This study was conducted under the guidance of four specific objectives: to ascertain knowledge of agricultural diversification by small-scale tobacco farmers, to determine the attitude of small-scale tobacco farmers towards agricultural diversification, to establish practices of agricultural diversification by small-scale tobacco farmers and to investigate the influence of knowledge, attitude, and socio-economic demographic characteristics of small-scale farmers' practice of agricultural diversification.

The data was collected through a questionnaire interview. Descriptive statistics, Tobit and Binary Logistic Regression were used to analyse the data. The descriptive statistics included charts, measures of central tendency (mean, median and mode) and cross tabulations

The study showed that there were more male than female headed households and most of the farmers had reached at least secondary school level (though many of the farmers enrolled but did not finish). Media and extension services were accessible to many of the farmers. The youthful population is small as compared to the aged. In general, the farmers have some knowledge agricultural diversification, and their attitude is negative. Though at subsistence level, many farmers are already diversifying agricultural production; the majority are growing for their home consumption and sell excess. Regression analysis showed that farmers with access to extension services and

media were at higher odds of having a positive attitude and knowledge about agricultural diversification. A binary regression analysis showed that education, farm size, attitude, knowledge and access to media had significant influence on the practice of agricultural diversification. Several scholarly work for example Khumalo (2017), Dube (2016), Sichoongwe (2014), Nazari (2010), Dube *et al*. (2016) and Akwiwu (2020) share some similarities in their findings with this research.

5.3 Conclusion

The Hurungwe district small-scale tobacco farming community is male dominated and has few youths involved in tobacco farming. Knowledge is a function of access to media and extension services. Increased access to media and extension services to farmers can transform their knowledge more than formal education does. Though marginal, the farmers have significant knowledge about agricultural diversification. The small-scale tobacco growing society is a composite one, almost half of the population has a negative attitude, and the other half is positive but generally their attitude is negative. Attitude is also shaped by media and extension access. Farmers are already practicing agricultural diversification but at a subsistence level. Farmers depend on tobacco as a cash crop. There are some cases where farmers grow tobacco alone. The practice of agricultural diversification by small-scale tobacco farmers is controlled by access to media, education level, attitude, knowledge, and media. Farmers are ambitious to learn as most of them expressed interest in education on other crops and livestock than tobacco.

5.4 Implications

The responses given by farmers show that they have great potential to diversify agricultural production whilst sustaining the tobacco enterprise. The dwindled proportion of young population in the farming communities shows that agriculture,

particularly tobacco is becoming less attractive to young people. Although there are probably other barriers to entry, it appears income and other intrinsic benefits of agriculture are not offering enough motivation for young people's participation in the sector. The findings of this research shows that if the agricultural diversification campaign is intensified through the media and extension, the small-scale farms may become diversified. To enhance knowledge and attitude of farmers, there is need to adapt the content (of media and training manuals) to the need for agricultural diversification. Although the frequency of visits by extension workers to farms is high, the marginal knowledge and attitude levels implies that farmer education is centred on tobacco.

In all respects, the study showed that wide variations exist in knowledge, attitude and practice of agricultural diversification. This implies that, whatever strategy or policy that is going to be put in place with regards to agricultural diversification, it has to be inclusive and have wide coverage. Farmers are keen to train each other, hence the extension strategy should also consider farmer to farmer extension. In summation, the findings of this study implies that diversification with tobacco is possible and farmers attitudes can be transformed to meet the expectations of the diversification policy. Policy efforts should be directed at gradually increasing tobacco alternative and not abrupt and total neglect of the tobacco enterprise.

5.5 Recommendations

From the findings and implication of findings of this research, it can be recommended that:

1. Since farmers with access to media were found to be at higher odds of practicing agricultural diversification, there may be need for a massive media campaign to encourage small-scale tobacco farmers to diversify. Farmers

already access to media tools and it is recommended that the government through the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development craft strategy on managing the content of the media.

2. The tobacco industry is already endowed with numerous agricultural experts including extension officers and 66% of the farmers showed that they have access to extension and training services. Therefore, government may consider realigning existing tobacco policies to the current needs so that tobacco merchants or contractors are compelled to support agricultural diversification.
3. One of the reasons why farmers could be having a negative attitude may be failure to access markets and find matching options. The Tobacco Industry and Marketing Board (the tobacco governing board in Zimbabwe) may consider realigning existing legislation to suit high value alternatives to tobacco such as Saffron crocus and Industrial Hemp. Saffron crocus has a potential yield of 10 to 15 kilograms and fetches between 3 000 to 5 000 United States of America dollars (Gheshm & Brown, 2021). Farmers may be encouraged to form co-operatives that meets the production standards and guidelines for industrial hemp. The legislation should thrive to mimic the order that exist in tobacco marketing.
4. There is need to train farmers to treat tobacco farming as business. This will enhance income transfer among projects and transform their attitude towards agricultural diversification. The problem of small-scale farmers is less financial and more to attitude and knowledge.
5. Because farm size was found to significantly influence the practice of agricultural diversification, government may consider an agricultural co-operative policy to encourage collaboration among farmers. This may lessen

the effect of small farm sizes and allow farmers to produce products that would otherwise need bigger pieces of land.

6. The education policy should aim at making it compulsory for all children to go to school. This will help in shaping the aspirations of the future generations and prepare them for future agricultural diversification enactments.

5.6 Suggestions for further research

This research was a benchmark study to ascertain the current agricultural diversification knowledge, attitude and practice level amongst small-scale tobacco farmers. Further research on this area may focus on:

1. A study on the impact of mass media and extension on the adoption of agricultural diversification. This will help on determining the efficiency extension and media after some years of implementation of the agricultural diversification policy.
2. A second KAP study after specific intervention to ascertain if there will be any improvement in the findings of this research. This will act as a monitoring and evaluation tool to see whether there has been an improvement or not as well as informing the overall strategy whether it will be effective.
3. A comparative analysis of tobacco and specific agricultural diversification options. The analysis may focus on gross margin analysis and feasibility studies, among others. It is important that all alternatives have to match tobacco in terms of profitability and resource sharing. This will lessen the potential of an economic shock associated with a total shift from tobacco.
4. An analysis of existing tobacco policy framework and alternatives. This will help in synchronising the new regulations or policies with the existing ones and avoid institutional conflict

REFERENCES

Akwiwu, U. N., & Patrick, R. E. (2020). Agricultural Development Programme's (ADP's) effectiveness in the use of mass media for agricultural information dissemination to farmers in Imo State, Nigeria. *Journal of Agriculture and Food Sciences*, *17*(2), 34–44. https://doi.org/10.4314/jafs.v17i2.4

Barghouti, S., Kane, S., Sorby, K., & Ali, M. (2004). *Agricultural Diversification for the Poor: Guidelines for Practitioners*.

Bialous, S. A. (2019). Impact of implementation of the WHO FCTC on the tobacco industry's behaviour. *Tobacco Control Journal*, *28*(Suppl 2), s94–s96. https://doi.org/10.1136/tobaccocontrol-2018-054808

Chapman, S. (1994). Tobacco and deforestation in the developing world. *Tobacco Control*, *3*(3), 191–193. https://doi.org/10.1136/tc.3.3.191

Chitongo, L. (2017). *The efficacy of smallholder tobacco farmers on rural development in Zimbabwe* [Doctor of Philosophy]. University of the Free State.

Chivuraise, C., Chamboko, T., & Chagwiza, G. (2016). An Assessment of Factors Influencing Forest Harvesting in Smallholder Tobacco Production in Hurungwe District, Zimbabwe: An Application of Binary Logistic Regression Model. *Advances in Agriculture*, *2016*, 1–5. https://doi.org/10.1155/2016/4186089

Craig, L., Fong, G. T., Chung-Hall, J., & Puska, P. (2019). Impact of the WHO FCTC on tobacco control: Perspectives from stakeholders in 12 countries. *Tobacco Control*, *28*(Suppl 2), s129–s135. https://doi.org/10.1136/tobaccocontrol-2019-054940

Daniel, G., Fiske, S., & Lindzey, G. (1998). *The Handbook of Social Psychology* (4th ed., Vol. 1). The McGraw-Hill Companies. www.oup.usa.org

Dube, L. (2016). Factors Influencing Smallholder Crop Diversification: A Case Study of Manicaland and Masvingo Provinces in Zimbabwe. *International Journal of Regional Development*, *3*(2), 1. https://doi.org/10.5296/ijrd.v3i2.9194

Dube, L. (2017). Farmer to Farmer Extension and Adoption of Improved Farming Practices: Evidence from Manicaland and Masvingo Provinces of Zimbabwe. *Scholars Journal of Agriculture and Veterinary Sciences*, *4*(6), 214–222.

Dube, L., Numbwa, R., & Guveya, E. (2016). Determinants of crop diversification amongst agricultural co-operators in Dundwa agricultural camp, Choma district, Zambia. *Asian Journal of Agriculture and Rural Development*, *6*(1), 1–13. https://doi.org/10.18488/journal.1005/2016.6.1/1005.1.1.13

Euromonitor International. (2018). *Global decline in tobacco demand* (No. 01). Euromonitor International.

FAO. (2014). *Guidelines for Assessing Nutrition-related Knowledge, Attitude and Practices*. Food and Agricultural Organisation.

Garwe, D. (2019). *THE HISTORY OF TOBACCO PRODUCTION IN ZIMBABWE – A SYNOPSIS*. 44.

Gheshm, R., & Brown, R. N. (2021). Growing Saffron Crocus in the Northeastern United States: Effects of Winter Protection and Planting Density. *HortTechnology*, *31*(4), 524–531. https://doi.org/10.21273/HORTTECH04836-21

Goletti, F. (1999). *Agricultural Diversification and Rural Industrialization as a Strategy for Rural Income Growth and Poverty Reduction in Indochina and*

Myanmar. *2*, 54. https://ageconsearch.umn.edu/record/97385/files/Agricultural%20diversification%20and%20rural%20industrialization.pdf

Gumucio, S., Merica, M., Luhmann, N., Zompi, S., & Ronsse, A. (2011). *Quantitative Methods: The KAP survey model (Knowledge, Attitude & Practices)*. 38.

Khumalo, C. (2013). *Can Farmers Diversify from growing tobacco in Zimbabwe*. Sweedish University of Agricultural Sciences.

Makate, C., Wang, R., Makate, M., & Mango, N. (2016). Crop diversification and livelihoods of smallholder farmers in Zimbabwe: Adaptive management for environmental change. *SpringerPlus*, *5*(1), 1135. https://doi.org/10.1186/s40064-016-2802-4

Mallock, N., Pieper, E., Hutzler, C., Henkler-Stephani, F., & Luch, A. (2019). Heated Tobacco Products: A Review of Current Knowledge and Initial Assessments. *Frontiers in Public Health*, *7*, 287. https://doi.org/10.3389/fpubh.2019.00287

Mango, N., Makate, C., Mapemba, L., & Sopo, M. (2018). The role of crop diversification in improving household food security in central Malawi. *Agriculture & Food Security*, *7*(1), 7. https://doi.org/10.1186/s40066-018-0160-x

Mavrodieva, Rachman, Harahap, & Shaw. (2019). Role of Social Media as a Soft Power Tool in Raising Public Awareness and Engagement in Addressing Climate Change. *Climate*, *7*(10), 122. https://doi.org/10.3390/cli7100122

Mbulukwa, M. C. (2017). *Analyzing The Importance Of Diversifying Beyond Tobacco For Small-Scale Farmers In Malawi*. 94.

Mishra, A. K., El-Osta, H. S., & Sandretto, C. L. (2004). Factors affecting farm enterprise diversification. *Agricultural Finance Review*, *64*(2), 151–166. https://doi.org/10.1108/00214660480001160

Mugwisi, T. (2015). *Communicating Agricultural Information for Development: The Role of the Media in Zimbabwe*. *65*(4), 281–299. https://doi.org/10.1515/libri-2015-0094

Napolitano, F., Della Polla, G., De Simone, C., Lambiase, C., Pelullo, C. P., & Angelillo, I. F. (2019). The Knowledge, Attitudes, and Practices of Community Pharmacists in their Approach to Antibiotic Use: A Nationwide Survey in Italy. *Antibiotics*, *8*(4), 177. https://doi.org/10.3390/antibiotics8040177

Nazari, M. R., & Hasbullah, A. H. (2010). *Radio as an Educational Media: Impact on Agricultural Development*. *2*, 8.

Olorunfemi, O. D., Oladipo, F. O., Oladele, T. O., & Oladele, O. I. (2016). Attitude of agricultural professionals towards their wards taking agriculture as a career in Kwara State, North Central Nigeria. *South African Journal of Agricultural Extension (SAJAE)*, *44*(2). https://doi.org/10.17159/2413-3221/2016/v44n2a419

Opdenakker, R. (2015). *Advantages and Disadvantages of Four Interview Techniques in Qualitative Research*. 13.

Pacheco, J., Ochoa-Moreno, W.-S., Ordoñez, J., & Izquierdo-Montoya, L. (2018). Agricultural Diversification and Economic Growth in Ecuador. *Sustainability*, *10*(7), 2257. https://doi.org/10.3390/su10072257

Parpart, J. (2005). Dalhousie University.

Pope, R. D., & Prescott, R. (1980). Diversification in Relation to Farm Size and Other Socioeconomic Characteristics. *American Journal of Agricultural Economics*, *62*(3), 554–559. https://doi.org/10.2307/1240214

Rav-Marathe, K., & Wan, T. T. H. (2016). A systematic review on the KAP-O Framework for diabetes education and research. *Medical Research Archives*, *4*(1), 21.

Scoones, I., Mavedzenge, B., Murimbarimba, F., & Sukume, C. (2018). Tobacco, contract farming, and agrarian change in Zimbabwe. *Journal of Agrarian Change*, *18*(1), 22–42. https://doi.org/10.1111/joac.12210

Seng, K. (2015). Determinants of Farmers' Agricultural Diversification: The Case of Cambodia. *Asian Journal of Agriculture and Rural Development*, 15.

Shakya, M. K. (2012). *A study on agricultural diversification in Morena District of Madhya Pradesh* [Thesis, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi]. http://krishikosh.egranth.ac.in/handle/1/96385

Sichoongwe, K. (2014). *Determinants and Extend of Crop Diversification among Smaaholder Farmers in Southern Zambia*. 87.

Siltrakool, B. (2017). *Assessment of Community Pharmacists' Knowledge, Attitude and Practice Regarding Non-Prescription Antimicrobial Use and Resistance in Thailand*. https://doi.org/10.13140/RG.2.2.28395.64801

Swarnam, T. P., Velmurugan, A., Ravisankar, N., Singh, A. K., & Zamir Ahmed, S. K. (2018). Diversification of Island Agriculture – A Viable Strategy for Adaptation to Climate Change. In *Biodiversity and Climate Change Adaptation in Tropical Islands* (pp. 553–575). Elsevier. https://doi.org/10.1016/B978-0-12-813064-3.00020-X

TIMB. (2019). *Tobacco Grower Booklet.pdf*. Tobacco Industry and Marketing Board. https://www.timb.co.zw/storage/app/media/downloads/Tobacco%20Grower%20Booklet.pdf

Tobacco Industry and Marketing Board. (2019). *2019 Tobacco Annual Statistical Report* (Annual Report No. 2019; pp. 28–30). Tobacco Industry and Marketing Board. www.timb.co.zw/downloads

USAID, & SPRING. (2011). *The KAP Survey Model (Knowledge, Attitudes and Perceptions)*. SPRING.

WHO. (2005). *WHO framework convention on tobacco control*. WHO.

Wisdom, J. P., Juma, P., Mwagomba, B., Ndinda, C., Mapa-Tassou, C., Assah, F., Nkhata, M., Mohamed, S. F., Oladimeji, O., Oladunni, O., Oluwasanu, M., Sanni, S., Mbanya, J.-C., & Kyobutungi, C. (2018). Influence of the WHO framework convention on tobacco control on tobacco legislation and policies in sub-Saharan Africa. *BMC Public Health*, *18*(S1), 954. https://doi.org/10.1186/s12889-018-5827-5

World Bank. (2017). *Gaining Momentum in Peruvian Agriculture: Opportunities to Increase Productivity and Enhance Competitiveness* (p. 150). World Bank, Lima. https://doi.org/10.1596/27517

APPENDICES

Appendix 1a: Research participant information and Consent Form (English version)

You are being asked to participate in a research study. Researchers are required to provide a consent form to inform you about the research study, to convey that participation is voluntary, to explain risks and benefits of participation, and to empower you to make an informed decision. You should feel free to ask the researchers any questions you may have.

Study Title: Knowledge, attitude, and practices of agricultural diversification by small-scale tobacco farmers in Zimbabwe

Researcher and Title: Robert T. Kutsukutsa

Department and Institution: Department of Agriculture and Natural Resources, Africa University

Sponsor: Tobacco Industry and Marketing Board (TIMB)

1. PURPOSE OF RESEARCH

- You are being asked to participate in a research study of knowledge, attitude, and practices of agricultural diversification by small-scale farmers in Zimbabwe
- You have been selected as a possible participant in this study because you are a registered small-scale tobacco grower
- From this study, the researchers hope to learn the status quo of knowledge, attitude, and practices of agricultural diversification by tobacco farmers in Zimbabwe. The research aims at unveiling the preparedness and state of mind of farmers to diversify from growing tobacco. It does not advocate for abandonment of tobacco but rather improvement of farm income through employment of such strategies as

agricultural diversification. The study will inform policy on how to create self-sustaining safety nets for tobacco farmers in Zimbabwe and elsewhere.

- Your participation in this study will take about 15 minutes (5 minutes for presurvey orientation and 10 minutes of interview)
    - I got your name from the Tobacco Industry and Marketing Board's Growers' Register. Your name was randomly selected from the 28 000 tobacco growers in Hurungwe District. In the entire study, 200 people are being asked to participate.

2. WHAT YOU WILL DO

This study shall begin with a pre-survey training to acquaint you with information on how you are supposed to participate in the interview process. After that I shall request through myself or my agents, to have an interview with you where my agents or I will ask you information regarding your socio-economic demographic situation, knowledge, attitude, and practice of agricultural diversification. There shall be no sensitive questions and you can notify me should you need any of the research findings (*upon conclusion of the* research).

3. POTENTIAL BENEFITS

You may not benefit directly from this research but the potential benefits for taking part in this study are

1. informing the concerned government departments of how effectively they can create self-sustaining safety nets for you.
2. Unveiling your needs to the government, extension officers, media practitioners and private sector

3. Overall adaptation of the tobacco statutes to the current global socio-economic situation.

4. POTENTIAL RISKS

- Contraction or transmission of Covid-19. To minimize this risk, guidelines stipulated as standards by the World Health Organisation like wearing of mask, sanitizing hands, and social distancing shall be adhered to. Agriculture has been enlisted as an essential service by the Government of Zimbabwe. I shall therefore not ask you to congregate, and interviews shall be conducted outdoors (at least two metre distance shall be used as standard social distance)

5. PRIVACY AND CONFIDENTIALITY

- The data for this project are being collected anonymously. Neither the researchers nor anyone else will be able to link data to you. No personal information that infringes into your privacy shall be recorded, the research shall only record observations and your responses to the questions. The responses are coded and none of them shall be linked to you or any other participants in the research.
- Information about you will be kept confidential to the maximum extent allowable by law.
- The collected information shall be kept confidential and shall only be accessible to researchers and research staff, AUREC and TIMB.
- The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain anonymous.

6. YOUR RIGHTS TO PARTICIPATE, SAY NO, OR WITHDRAW

- Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.
- You have the right to say no.
- You may change your mind at any time and withdraw.
- You may choose not to answer specific questions or to stop participating at any time.
- Choosing not to participate or withdrawing from this study will not make any difference in the quality of any services you may receive.

7. COSTS AND COMPENSATION FOR BEING IN THE STUDY

- Unless communicated to you, you will not incur any cost in participating in this research.

CONTACT INFORMATION

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researcher; Mr Robert T. Kutsukutsa, 20877 Darwendale View, Norton, +263778092670, kutsukutsar@africau.edu

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the AUREC at Tel: 020 2060026 / 2060075 office extension is 1156., or e-mail aurec@africau.edu or regular mail at Africa University, P. O. Box 1320, Mutare.

12. DOCUMENTATION OF INFORMED CONSENT.

Your signature below means that you voluntarily agree to participate in this research study.

_____

_____

Signature Date

You will be given a copy of this form to keep.

Appendix 1b: Research participant information and Consent Form (Shona version)

Fomu rekutsvaga mvumo kubva kune vachatora chikamu muongororo

Munokumbirwa kutora chikamu mune ino ongororo yekudzidza. Vaongorori vanofanirwa kupa fomu yemvumo yekukuzivisai nezvechidzidzo chekutsvaga, kuratidza kuti kutora chikamu apa isarudzo yako, kutsanangura njodzi uye zvakanakira kutora chikamu, kukupa simba rekuita sarudzo ine ruzivo. Unofanirwa kunzwa kusununguka kuvhunza vaongorori chero mibvunzo yaungave unayo.

Zita reongororo: Ruzivo, mafungiro, nemaitiro emabhizinesi ekurima akasiyana nevarimi vane mapurazi madiki muZimbabwe

Muongorori: Robert T. Kutsukutsa

Chikoro/ bazi raanodzidza: Department of Agriculture and Natural Resources, Africa University

Kunowanika muongorori: 20877 Darwendale View, Norton

Mutsigiri: Tobacco Industry and Marketing Board (TIMB)

1. Chinangwa cheongororo

- Muri kukumbirwa kutora chikamu muongororo yekutsvaga ruzivo, mafungiro uye maitiro emabhizinesi ekurima akasiyana nevarimi vane mapurazi madiki muZimbabwe. Makasarudzwa semunhu anogona kutora chikamu muchidzidzo ichi nekuti uri murimi akanyoreswa neTIMB ane purazi diki muZimbabwe. Kubva pachidzidzo ichi vaongorori vanotarisira kudzidza chimiro chezivo, mafungiro nemaitiro emabhizinesi ekurima akasiyana nevarimi vane mapurazi madiki muZimbabwe. Ongororo iyi haikurudzire kuti varimi vasiye kurima fodya, asi kuti

vatsigise homwe dzavo nekuita mabhizinesi ekurima akawanda. Ongororo iyi inobatsira hurumende nemamwe mabazi ezvekurima pakugadzira hurongwa kana mitemo yakanangana nezvekuitwa kwemabhizinesi akasiyana ekurima.

- Kutora chikamu kwako pachidzidzo ichi kunotora maminetsi gumi nemashanu (maminitsi mashanu ekutsanangura donzvo reongororo nekubvumirana uye maminetsi gumi ekubvunzurudzwa)
- Ndakawana zita renyu kubva kuTobacco Industry and Marketing Board's Growers 'Register. Zita renyu rakasarudzwa kubva pavarimi vanezviuru makumi maviri nesere (28 000) kubva muRuva reHurungwe.Muchidzidzo chose, vanhu mazana maviri vakakumbirwa kutora chikamu muongororo iyi

2. ZVAMUCHAITA

Ongororo iyi ichatanga nekukuzivisai donzvo uye kukuzivisai zvamunotarisirwa kuita pamunotora chikamu muongororo iyi. Ndichazokumbira ndakazvimiririra kana kuburikidza nevamiriri vangu kuva nenhaurirano nemi pamusoro pemagariro amakaita, ruzivo rwamuinarwo, zvamuri kuita uye mafungiro enyu pamusoro pekuita mabhizimisi mamwe ekurima amungaita muchirima fodya. Ndichaedza kusabvunza mibvunzo inokufumurai. Munondizivisa mushure mekunge tapedza nhaurirano kana muchizoda kuziva zvichabuda muongororo ino.

3. ZVAKANAKIRA ONGORORO INO

Munogona kusava nezvidziyo kana mari yamungawane kubva paongororo ino asi ongororo ino yakanakira zvinotevera:

4. Kuti hurumende iwane pekutangira pakubatsira varimi vefodya vane mapurazi madiki kumisa mamwe mabhizinesi ekurima

5. Kuzivisa zvamungade zvinobatsira Hurumende, varimisi, vatori/vanyori venhau nevemakambani
6. Kunanganisa mitemo yezvekurimwa kwefodya nemamiriro akaita matanho ehupfumi nemagariro pasi rese

4. NJODZI DZINOGONA KUITIKA

- Kutapuriranwa kweCovid-19. Kuti kudzikise njodzi iyi, nhungamiro diki dzakatemwa pazviyero neWorld Health Organisation dzinosanganisira kupfeka dzikatiro, kugezwa kwemaoko uye kuchengetedzwa kwenhanho apo tinokurukura dzichateverwa. Munguva yeLockdown ino yakatemwa neHurumende yeZimbabwe, bazi redu rezvekurima rakatarwa kuti risamire kushanda. Saizvozvo, hatikuunganidzei asi tichashanyira murimi mumwe namumwe tichisiya mamita anopfuura maviri patinenge tichiita nhaurirano.

5. KUVANZIKA NOKUVIMBIKA

- Pakunyora zvatichawana kubva mutsvagiridzo, mazita enyu haanyorwi. Pfungwa dzamunotipa hadzizogoni kunanganiswa nemi sedungamunhu. Muongorori haazopi ani naani zvake mazita enyu kana zvinokupinzai munjodzi. Zvatichawana kubva muongororo iyi zvinokwanisa kuwanika neAfrica University, TIMB kana imi. Zviwanikwa kubva muongororo iyi zvinogona kuzoshandiswa kunyora nhau dzefundo kana nhaurirano mumisangano inosanganisa Paramende.

6. KODZERO DZAKO

- Kutora chikamu ndekwekuzvidira. Kuramba kutora chikamu hakuzove nechirango kana kurasikirwa kwemabhenefiti iwe aunopihwa neimwe nzira.

Unogona kurega kutora chikamu chero nguva pasina chirango kana kurasikirwa kwemabhenefiti iwe aunokodzera kupihwa.

- Une kodzero yekuti kwete.
- Unogona kushandura pfungwa dzako chero nguva uye woenda.

- Unogona kusarudza kusapindura mimwe mibvunzo kana kumira kutora chikamu chero nguva.
- Kusarudza kusatora chikamu kana kutora chikamu kubva muchidzidzo ichi hakuite musiyano pahunhu hwemasevhisi aunogashira.

7.MARI UYE MURIPO WEKUVA MUCHIDZIDZO

- Kunze kwekunge zvaudzwa kwauri, haubhadharwe mari yekupinda mutsvakiridzo iyi.

Ruzivo rwekutaurirana

Kana iwe uine zvauri kunetseka kana mibvunzo nezve chidzidzo ichi, senge nyaya dzesainzi, maitiro ekuita chero chikamu chayo, kana kumhan'ara kukuvara, ndapota nyorera Muongorori; VaRobert T. Kutsukutsa, 20877 Darwendale View, Norton, +263778092670, kutsukutsar@africau.edu

Kana iwe uine mibvunzo kana zvinonetsa pamusoro pebasa rako nekodzero semubatsiri wekutsvagurudza, ungade kuwana ruzivo kana kupa zvekuisa, kana uchida kunyoresa chichemo nezve chidzidzo ichi, unogona kubata, usingazivikanwe kana uchida, iyo AUREC paTel: 020 2060026/2060075 kuwedzerwa kwehofisi 1156., kana e-mail aurec@africau.edu kana tsamba dzinowanzoitika ku Africa University, PO Box 1320, Mutare.

12. ZVINYORWA ZVEMVUMO YAKABVUMIDZWA

Siginecha yako pazasi inoreva kuti iwe unozvidira kubvuma kutora chikamu mune ino ongororo yekudzidza.

_____

_____

Zuva resiginecha

Iwe unozopihwa kopi yeichi fomu kuti uchengete.

Appendix 2a: Questionaire (English Version)

Good day Sir/ Madam. I am working on a project concerned with agricultural diversification which you could participate in. I am completing a survey among participants to know more about their knowledge, attitudes and practices to do with agricultural diversification. The interview will take approximately 30 minutes of your time and all the information that I will obtain will remain strictly confidential. Your answers and name will never be revealed. Also, you are not obliged to answer any questions you do not want to, and you may stop the interview at any time.

The objective of this study is to assess the agricultural diversification situation. This is not to evaluate or criticise you. You are therefore advised not to feel pressured to give specific response. I expect you to answer the questions honestly, telling me about what you know, how you feel, the way you live and how you manage your farm enterprise.

SOCIO ECONOMIC DEMOGRAPHIC INFORMATION		
1. Ward and code	Which ward are you in?	
	Code:	_ _ _ _
2. Gender		Male □ Female □
3.Household Characteristics	Age of household head?	25-34 □ 35-44 □ 45-54 □ 55 and above □
	How many members are in the household?	
	How many members are between the age of 16 and 65?	
4.Education characteristics	What is your highest level of education? (*of household head)*	No formal education □ Primary □ Secondary/High School □ Tertiary □
	How frequently do you see the extension officer(s)?	Weekly □ Fortnightly □ Monthly □ Never □
5. Media Access	Do you have a working radio or television? *If Yes,* Is there a farming program that you follow?	Yes□ No □ Yes □ No □
	Do you receive any SMS or email updates that are agricultural?	Yes □ No □
	Any reading material? (*Magazines, Newspapers, Journals etc*)	Yes □ No □
	Do you follow any social media pages/ groups or platforms that give information on farming?	Yes □ No □

6. Farm Characteristics	What is the size of your farm?	
	What do you use as drought power?	
	What do you grow on your farm for business?	

I am going to ask you some about agricultural diversification. Please let me know if you need me to clarify any of my questions. Feel free to ask any question you may have. Give a single response to the questions that follow.

KNOWLEDGE

Question K.1: Agricultural diversification includes:

- ☐ Value-addition
- ☐ Other crops and livestock
- ☐ Tobacco only
- ☐ I don't know

Question K.2: What are the advantages of agricultural diversification?

- ☐ Spread and reduce risk
- ☐ It is just a cultural practice
- ☐ Increases farm income
- ☐ Ensures food security
- ☐ I do not have an idea

Question K.3: Which enterprise set would you chose for your farm?

- ☐ Tobacco, Maize, Cattle farming and Poultry

☐ Tobacco, Groundnuts, Poultry and Plantations

☐ Tobacco Only

☐ Tobacco, Chia, Banana and Piggery

☐ I don't know

Question K.4: Are you aware of any government programs that encourages agricultural diversification?

☐ Yes

☐ No

Question K.5: Do you keep records for your agricultural cycles/ enterprises every year?

☐ Yes

☐ No

Question K.6: What factors can a farmer consider when considering agricultural diversification?

☐ Ease of management

☐ Common risks for the region/ area

☐ Market availability

☐ Knowledge in the enterprises

☐ I do not know

☐ Other, specify _____

Question K.7: Can a farmer grow tomatoes and tobacco in the same field?

☐ Yes

☐ No

Question K.8: Many farmers complain of lack of ready markets for other products other than tobacco. How can farmers avoid such?

☐ Do proper research and consult market/ agricultural trade agencies

☐ Seek some marketing contract with consumer organisation

☐ Stick to tobacco and maximise your returns

☐ I do not know

☐ Other, specify _____

Question K.9: Climate is changing and the world becoming drier. It is therefore not necessary to diversify from growing tobacco.

☐ Yes

☐ No

Question K.10: If a farmer is finding it difficult to run many enterprises at once, what is the best strategy that they can use?

☐ Find crops or projects that share resources

☐ Just focus on one crop and maximise profits

☐ Try value addition and sell processed products

☐ Wait until you have a lot of money to run multiple enterprises

☐ I do not know

☐ Other, specify _____

PRACTICES

Question P.1: What are the current operations at your farm?

☐ Tobacco only

☐ Multiple crops excluding tobacco

☐ Cropping and value addition

☐ Tobacco and other crops

☐ Tobacco and livestock

Question P.2: I consult extension officers on every field operation at my farm

☐ Yes

☐ No

Question P.3: Are you currently engaged in any other agribusiness activities besides tobacco?

☐ Yes

☐ No

If yes, how many?

Question P.4: Besides crops, what other enterprises are you pursuing for business?

☐ None

☐ Livestock

☐ Value-addition

☐ Other, specify _____

Question P.5: What challenges do you face from having many enterprises at your farm? Or rather what stops you from pursuing other agricultural enterprises?

☐ Finances

☐ Knowledge

☐ Size of land

☐ Market availability

☐ Other, specify _____

Question P.6: How long have you been growing tobacco?

☐ 1 year

☐ 2 years

☐ 3 years

☐ More than 3 years

Question P.7: I do not miss trainings conducted by NGOs, government agencies and private agricultural companies.

☐ Yes

☐ No

Question P.8: I keep business records on all the agricultural enterprises at my farm

☐ Yes

☐ No

Question P.9: I channel tobacco proceeds towards other farming enterprises

☐ Yes

☐ No

ATTITUDE

A1. It is possible to have several agricultural businesses on a small farm

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A2: It is difficult to run other agricultural businesses at the same time growing tobacco

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A3: Proceeds from tobacco should never be channelled to other enterprises

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A4: I am confident to teach/ train other farmers on agricultural diversification

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A5: I have many experiences of growing tobacco; it is not necessary for me to attend those farmer training

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A6: It is best to stick to what I know, why would I need to try new things.

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A7: During farmer training, it is important that the facilitators emphasise on agricultural diversification

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A8: To sustain biodiversity and rural livelihoods and mitigate climate change, it is necessary for government to enact a policy on agricultural diversification

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

A9: My farm is too small to do many enterprises

☐ Strongly agree

☐ Agree

☐ Undecided

☐ Disagree

☐ Strongly disagree

Open ended questions:

What do you think government should do to promote agricultural diversification?

1. What influences you into growing tobacco?

Appendix 2b: Questionaire (Shona version)

Makadii zvenyu? Ndine chidzidzo chandiri kuita chakananganana nemabasa akasiyana siyana ehurimi angaitwa nemurimi wefodya ane munda muduku. Ndinokumbirawo kukubvunzai mibvunzo yakananganana nedzidzo iyi. Ndinoda kuziva pamusoro peruzivo rwamuinarwo, mafungiro kana matorero amunoita mabasa akasiyana siyana angaitwa pamunda nemurimi uye kuti mune mabasa api amuri kuita pari zvino. Nhaurirano iyi ichatora maminitsi anokwana gumi nemashanu uye zvese zvamuchandiudza hazvizodurwi kuna ani zvake. Handisi kuzotora zita renyu saka mhinduro dzenyu hadzigoni kuzonanganiswa nemi. Hamusungirwe kupindura mibvunzo yose saka makasununguka kusapindura mimwe mibvunzo yamunofungira kuti haikuitirei uye munotenderwa kumisa nhaurirano iyi panguva yamunoda.

Chinangwa chedzidzo iyi ndechekuona mabasa akasiyana siyana ari kuitwa nemurimi ane munda muduku kuti atsvage raramo. Dzidzo iyi haina kunangana nekukushorai kana kukuongororai saka ndinotarisira kuti munondipa mhinduro dzechokwadi muchindiudzawo zvamunofunga, zvamunoziva uye zvamuri kuita pamusoro pemabasa akasiyana siyana ehurimi angaitwa nemurimi.

MAGARIRO AMAKAITA		
1. Wadhi	Muri muwadhi ani?	
		_ _ _ _
2. Muri munhu akaita sei?		Murume □ Mukadzi □
3.Mamiriro akaita musha wenyu	Samusha vane makore mangani?	25-34 □ 35-44 □ 45-54 □ 55 zvichidarika □

	Muri vangani mumusha wenyu?	
	Mumusha wenyu, mune vanhu vangani vane makore ari pakati pe16 ne 65?	
4.Zvidzidzo	Makasvika papi muzvidzidzo zvenyu?	Handina kuenda kuchikoro □ Primary □ Sekondari□ Korichi □
	Madhumeni anouya kuzokudzidzisai kwapera nguva yakareba sei?	Svondo□ Masvondo maviri □ Mwedzi □ Havauyi □
5. Kuwana nhau	Mune chivhitivhiti (TV) kana wairesi inoshanda here? *Kana mati hongu:* Pane chirongwa chamunoona kana kuteerera here?	Hongu□ Kwete□ Hongu □ Kwete □
	Munotambira nhau dzezvekurima here pambozhanhare yenyu?	Hongu □ Kwete □
	Munowana zvekuverenga here zvinosanganisira bepanhau?	Hongu □ Kwete □
	Mune zvikwata zvepadandemutande zvamunopinda here zvakaita seWhatsapp groups, Twitter kana Facebook	Hongu□ Kwete □
6. Mamiriro emunda	Munda wenyu wakakura sei?	
	Munoshandisa chii pakurima?	
	Munorima chii chekutengesa pamunda penyu?	

RUZIVO

Question K.1: Mabasa ehurimi anosanganisira:

- ☐ Kuwedzera hukoshi hwezvandinorima
- ☐ Zvimwe zvirimwa nezvipfuyo

- ☐ Fodya chete
- ☐ Handizive

Question K.2: Zvakanakirei kuita mamwe mabasa ehurimi ari kunze kwefodya?

- ☐ Kudzivirira njodzi dzinokonzerwa nekukundikana kwechirimwa chefodya
- ☐ Tinongozviita
- ☐ Zvinowedzera mari inowanika nemurimi
- ☐ Zvinounza maguta mumba
- ☐ Handizive

Question K.3: Ndemapi mabasa/ mabhindauko amungasarudza pane zvinotevera

- ☐ Fodya, chibage, kupfuya mombe nehuku
- ☐ Fodya, Nzungu, Huku nemiti
- ☐ Fodya Chete
- ☐ Fodya, Chia, Banana and Nguruve
- ☐ Handizive

Question K.4: Mungazivawo chirongwa cheHurumende chakanangana nekuita mabasa ehurimi anopa raramo akawanda here?

- ☐ Hongu
- ☐ Kwete

Question K.5: Munochengeta magwaro emarimiro amunoita here?

- ☐ Hongu
- ☐ Kwete

Question K.6: Zvii zvingatariswa nemurimi kana achida kurima zvinhu zvakawanda (zvirimwa kana zvipfuyo) panguva imwe chete ?

- ☐ Kureruka pakumaneja
- ☐ Njodzi dzinowanzoitika kudunhu / nharaunda
- ☐ Kuwanika kwemusika wekutengesera
- ☐ Ruzivo
- ☐ Zvimwewo zvisina kunyorwa pamusoro. Dura……

- ☐ Handizive

Question K.7: Zvakakodzera here kurima madomasi mumunda mumwe chete nefodya?

- ☐ Hongu
- ☐ Kwete

Question K.8: Varimi vazhinji vanogunun'una nekushaikwa kwemisika yakagadzirira zvimwe zvirimwa kana zvipfuyo kunze kweFodya. Varimi vangadzivise sei zvakadaro?

- ☐ Ita tsvagiridzo chaiyo uye ubvunze vamakambani / vezvekurima zvekurima
- ☐ Tsvaga chibvumirano chekushambadzira nesangano revatengi
- ☐ Namatira kufodya kuti mari irambe ichiwanda
- ☐ Zvimwewo zvisina kunyorwa pamusoro. Dura……
- ☐ Handizive

Question K.9: Mamiriro ekunze ari kuchinja uye nyika iri kuoma. Saka hazvigone kuti tiite zvimwe kunze kwefodya.

- ☐ Hongu
- ☐ Kwete

Question K.10: Kana murimi achiona zvichimunetsa kumhanyisa mabhizinesi mazhinji panguva imwechete, nderipi zano rakanakisa ravanogona kushandisa?

- ☐ Tsvaga zvirimwa kana mapurojekiti anoshandisa zviwanikwa zvimwe chete
- ☐ Namatira pachirimwa chimwe chete kuti uwedzere purofiti
- ☐ Edza kuwedzera hukoshi hwezvigadzirwa zvinobva mukurima
- ☐ Mirira kusvikira wawana mari yakawanda yekuita mabhizinesi mazhinji
- ☐ Zvimwewo zvisina kunyorwa pamusoro. Dura……
- ☐ Handizive

ZVIRI KUITWA NEMURIMI

Question P.1: Ndezvipi zvamuri kurima pari zvino pamunda wenyu?

- ☐ Fodya chete
- ☐ Zvirimwa zvakawanda kunze kwefodya
- ☐ Zvirimwa nekuwedzera hukoshi hwezvatinorima
- ☐ Fodya nezvimwe zvirimwa
- ☐ Fodya nekupfuya

Question P.2: Ndinobvunza madhumeni padanho rese randinoita pamunda

- ☐ Hongu
- ☐ Kwete

Question P.3: Mune mamwe mabasa ebhizinesi amuri kuita here pamunda wenyu?

- ☐ Hongu
- ☐ Kwete

Kana iri hongu, mangani?

Question P.4: Kunze kwezvirimwa, ndeapi mamwe mabhizinesi auri kutsvaga nawo mari?

- ☐ Hapana
- ☐ Zvipfuyo
- ☐ Value-addition
- ☐ Zvimwewo. Dura……

Question P.5: Ndeapi matambudziko aunosangana nawo kubva pakuva nemabhizinesi mazhinji papurazi rako? Kana kuti zvinokutadzisa kuita mabhizinesi akawanda papurazi pako?

- ☐ Mari
- ☐ Ruzivo
- ☐ Kukura kwemunda
- ☐ Kuwanika kwevatengi
- ☐ Zvimwewo. Dura……

Question P.6: Mave nenguva yakareba sei muchirima fodya?

- ☐ Gore rimwe chete
- ☐ Makore maviri

- ☐ Makore matatu
- ☐ Kupfuura makore matatu

Question P.7: Handiregi kuenda misangano yezvekurima inounganidzwa neHurumende, vemakambani, nemaNGO?

- ☐ Hongu
- ☐ Kwete

Question P.8: Ndinochengetedza nekunyora magwaro ezvandinoita papurazi pangu?

- ☐ Hongu
- ☐ No

Question P.9: Ndinoshandisa mari yandinowana kufodya mukumisa mamwe mabhizinesi?

- ☐ Hongu
- ☐ Kwete

MAFUNGIRO

A1. Zvinoita kuva nemabhizinesi ekurima akawanda papurazi diki

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A2: Zvakaoma kuita mamwe mabhizinesi ekurima ndichirimazve fodya.

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A3: Mari yefodya haifanirwe kushandiswa mukumisa mamwe mapurojekiti

- ☐ Ndinobvumirana nazvo zvakasimba

- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A4: Ndinogona uye handinyare kumira ndichidzidzisa vamwe varimi pamusoro pemapurojekiti mamwe.

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A5: Ndave nenguva yakarebesa ndichirima fodya saka hazvina kukosha kuti ndirambe ndichingodzidz

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A6: Zvakanakisa kunamatira kune zvandinoziva, ndingadireiko kuedza zvinhu zvitsva.

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A7: Munguva yekudzidziswa kwevarimi, zvakakosha kuti vafundisi vasimbise pamusoro pemamwe mabhizinesi ekurima angaitwa nemurimi

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo

- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A8: Kuchengetedza zvipenyu zvakasiyana-siyana uye raramo dzekumaruwa uye kudzikisira shanduko yemamiriro ekunze, zvakafanira kuti Hurumende igadzire mutemo wekuti murimi wese wefodya ane purazi duku aite mabhizinesi akawanda ekurima

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

A9: Munda wangu mudukusa kuti ndiite mabhizinesi akawanda panguva imwe chete

- ☐ Ndinobvumirana nazvo zvakasimba
- ☐ Ndinobvumirana nazvo
- ☐ Handizive
- ☐ Handibvumirane nazvo
- ☐ Handibvumirane nazvo zvakasimba

Mibvunzo inopindurwa zvawada:

2. Ndezvipi zvingaitwe neHurumende kukurudzira varimi vane mapurazi maduku kuita mabhizinesi akawanda ekurima?
3. Zvii zvinokukwezvai mukurima fodya?

Appendix 3: AUREC Approval Letter

AFRICA UNIVERSITY

RESEARCH ETHICS

COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU1921/21 23 February 2021

Robert Tinashe Kutsukutsa

C/O CHANS

Africa University

Box 1320

Mutare

RE: KNOWLEDGE, ATTITUDES, AND PRACTICES OF SMALL-SCALE TOBACCO FARMERS ON AGRICULTURAL DIVERSIFICATION: A CASE OF HURUNGWE DISTRICT, ZIMBABWE

Thank you for the above titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.

a) Research proposal

b) Data collection instruments

c) Informed consent guide

· **APPROVAL NUMBER** AU1921/21

This number should be used on all correspondences, consent forms, and appropriate documents.

· **AUREC MEETING DATE** NA

· **APPROVAL DATE** February 23, 2021

· **EXPIRATION DATE** February 23, 2022

· **TYPE OF MEETING** Expedited

After the expiration date this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before expiration date.

· **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.

· **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)

· **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

Yours Faithfully

MARY CHINZOU – A/AUREC ADMINISTRATOR FOR CHAIRPERSON,

AFRICA UNIVERSITY

RESEARCH ETHICS COMMITTEE

INVESTING IN AFRICA'S FUTURE

Appendix 4: Tobit Regression model summary (Knowledge)

```
tobit KSCORE Gender Age_cont Edu_Rec AccesstoExtension Media_Access
      Experience_yrs, ll(0) ul(100)

Refining starting values:
Grid node 0:   log likelihood  = -616.27204
Fitting full model:
Iteration 0:   log likelihood  = -616.27204
Iteration 1:   log likelihood  = -616.27204
Tobit regression          Number of obs    =       158
                          Uncensored       =       158
Limits: lower = 0         Left-censored    =         0
        upper = 100       Right-censored   =         0
                          LR chi2(6)       =     25.37
                          Prob > chi2      =    0.0003
Log likelihood = -616.27204  Pseudo R2      =    0.0202
```

Appendix 5: Binary Logistic Regression Model summary (Attitude)

logistic ATTSTATUS Gender Age_cont Edu_Rec AccesstoExtension Media_Access Experience_yrs

Logistic regression Number of obs = 158

LR chi2(6) = 32.08

Prob > chi2 = 0.0000

Log likelihood = -93.464345

Pseudo R2 = 0.1465

Appendix 6: Binary Logistic Regression Model summary (Practice)

```
logistic PRACTICESTATE HHSize  KSCORE       ATTSCORE   Gender  Age_cont
        Edu_Rec        AccesstoExtension     Media_Access Experience_yrs


Logistic regression             Number of obs=      158
                                LR chi2(9)    =     69.86
                                Prob > chi2   =     0.0000
                                Log likelihood = -73.051507
                                Pseudo R2     =     0.3235
```