ANALYSIS OF HOUSEHOLD FOOD ACCESS IN TOBACCO GROWING REGIONS OF ZIMBABWE

A dissertation submitted in partial fulfilment of the requirements for the Master of Science Degree in Food Security and Sustainable Agriculture (Policy)

Bindura University of Science Education

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DECLARATION

I hereby declare that the research project entitled "ANALYSIS OF HOUSEHOLD FOOD ACCESS IN TOBACCO GROWING REGIONS OF ZIMBABWE" submitted to Bindura University of Science Education, Department of Agricultural Economics, Education and Extension is a record of an original work done by me under the guidance and supervision of Dr. L. Musemwa and this work is submitted in partial fulfilment of the requirements for the award of a Master of Science Degree in Food Security and Sustainable Agriculture (Policy). The results embodied in this thesis have not been submitted to any University or Institute for the award of any degree of diploma.

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DEDICATION

Glory be to trinity, the almighty LORD Jesus Christ, GOD the father and the Holy Spirit. Without Him it would not have been possible to complete this research. I have witnessed his faithfulness in providing for my needs every step of the way and in leading me into experience far better than I could have hoped for or imagined. Whatever l have learnt and whatever this endeavour has produced is by his grace.

I proudly dedicate this work to:-

To my beloved late mother who fought back at cancer until her last breath. I am motivated by your bravery Gogo Chirwa to finish this project in honour of the education foundation that you laid.

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ABSTRACT

According to TIMB (2019), it have been noted that there is a continuous increase in the number of new smallholder tobacco growers over the past years. At the same time they are reports of reduction in the production of food crops. This research sought to analysis the household food access in tobacco growing regions of Zimbabwe. This study analysed household food access as measured by HFIAS in Hurungwe district. It was motivated by the fact that household food insecurity in Hurungwe is at 28% (moderate hunger score) against a national average of 23% according to ZimVac, 2020. This is comparatively higher for an area that has ideal agro-ecological conditions for food crop production. A cross-sectional survey of 150 households was conducted in Tengwe, Magunje and Kazangarare. Initially, stratified random sampling was used to identify specific farmer category. Thereafter, purposive sampling was used to select and come up with the smallholder farmers' households to sample. The primary data was obtained through the use of a survey questionnaire, interviews and observations, while the secondary data was extracted from journals, newspapers and library sources. The mixed method approach was adopted to cover both qualitative and quantitative data analysis. The quantitative data were analysed in SPSS V22 and MS Excel environments to produce tables and graphs. Multiple linear regression was used to determine the factors that influence food access at household level. The research study was able to determine the food access level of all the households that participated in the survey using the HFIAS score sheet. The results shows a significant variation in food access among the tobacco and non-tobacco growing households in the tobacco growing regions of Zimbabwe. The researcher concluded that 59.3% of the small holder farmers were food secure whilst 40.7% of the sample were not food secure. In the tobacco farming category about 74% were found to be food secure. Seventy-six percent of the respondents commented that tobacco production was their most profitable enterprise. The following factors were found to significantly affect household food access in the tobacco growing regions of Zimbabwe; farming experience, gender, age of the family head, household size, types of farming activities (Tobacco production), annual household income, size of arable land, farm size and duration of food programme. The paper recommends an increase in the establishment of synergy relationships between Government, NGO`s and Private organisations in order to provide infrastructural development especially dams, irrigation schemes, community boreholes, improved road networks and affordable food crop inputs amongst other things.

Keywords: Food security and small holder farmer.

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LIST OF ACRONYMS

AGRITEX	Department of Agricultural, Technical and Extension Services
AMA	Agricultural Marketing Authority
ANOVA	Analysis of Variance
CSO	Central Statistics Office
D-W	Durbin Watson
FAO	Food and Agricultural Organisation
GMB	Grain Marketing Board
NGO	Non-Governmental Organisation
SPSS	Statistical Package for Social Sciences
TIMB	Tobacco Industry and Marketing Board
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
USD	United States American Dollar
VIF	Variance Inflation Factor
ZIMSTAT	Zimbabwe National Statistics Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee
ZTA	Zimbabwe Tobacco Association

CHAPTER 1
INTRODUCTION

1.0 Background of the study

The 2019 Zimbabwe Vulnerability Assessment Committee (ZimVAC) Rural Livelihoods Assessment (RLA) report projected that 59% of the rural population would be cereal insecure during the peak hunger period (January to March 2020). This food insecurity prevalence translated to a population of about 5.5 million rural people. This calls for urgent need for food distribution or cash based transfers (to promote the local economy where feasible) to food insecure households in order to avoid a worsening situation.

According to Zimbabwe National Statistics Agency (ZIMSTAT), (2014); United Nations International Children's Emergency Fund (UNICEF), (2005) and World Bank (2015) the majority of poor Zimbabweans reside in rural areas where they depend mainly on farm-based income. In developing countries, smallholder agriculture is based on cash crop production and in Zimbabwe tobacco production has been embraced as such a crop (Moyo, 2004).

Nevertheless, it is yet to be proven if the potential has been converted into perceivable economic growth and food security. Though faced with several challenges, smallholder tobacco farmers have successfully managed to continuously increase their yield from a national average of 850kg/ha in 2004 to 1700kg/ha in 2019 output (Tobacco Industry and Marketing Board (TIMB), 2019). During the same period, area under cultivation has increased from 44025ha to 145000ha in 2004 and 2019 respectively.

The increase in both area and yield has been attributed to a number of issues; amongst them improved technical assistance from tobacco contractors; accumulation of experience by the growers over time; government-initiated mechanisation and irrigation development projects. While tobacco farming now provides a lucrative way to increase household income, rural communities in Zimbabwe have been increasing their interest in growing the cash crop. Many smallholder farmers are resorting to tobacco production to supplement their income thereby improving the possibility of them attaining food security (TIMB, 2012).

According to Jerie and Ndabaningi (2011), the production of food crops has gradually been declining in recent years as a result of erratic rainfall patterns. As a result, most smallholder farmers are now resorting to the cultivation of cash crops such as tobacco as a risk management strategy and since it tends to reward farmers very well (Jerie and Ndabaningi, 2011). Smallholder farmers are moving away from production of grains to production of tobacco because they are paid immediately on delivery, as compared to the Grain Marketing Board (GMB) which takes longer to pay them. As a result, smallholder farmers view tobacco production as a better livelihood strategy since they expect to obtain better income levels from selling tobacco and purchase food crops such as maize and attain food security though it remains to be verified by studies to ascertain whether they are succeeding in this endeavour.

Declining agricultural output of edible crops due to uneven rainfall distribution in most of the seasons, coupled with a weakened social protection systems and the (Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome(AIDS) epidemic, have resulted in high incidence of poverty and vulnerability among the population Government of Zimbabwe (G.o.Z) and Food and Agriculture Organisation (F.A.O), 2012. As a result, the livelihood strategies of the majority of people became limited thereby constraining their livelihood outcome and consequently rendering them food insecure.

Consequently, it is of paramount importance to compare household food security of tobacco and non-tobacco growers to verify if switching of these smallholder farmers from grain production to tobacco farming is achieving the intended goal of improving their livelihoods and food security status. Mudimu (2004) identified an increase in the production of higher-value cash crops as contributing to the worsening food crisis.

1.1 Research problem statement

Tobacco farming is largely credited for its increasing gross revenue and foreign currency generation for farmers and the country respectively. Tobacco is a cash crop ranked amongst top foreign currency earners in Zimbabwe. It accounted for a quarter of Zimbabwe`s $3.8 billion in total export earnings in 2017, behind gold.

According to TIMB (2019), tobacco constituted 15% of the country`s gross domestic product (GDP) (USD$743million) in 2018. The national average yields stand at 1800kg/ha averaging usd$3,00/kg (TIMB 2018). Accordingly, averaging a gross income of USD$5,400.00 /ha.

The findings by the Zimbabwe Vulnerability Assessment Committee (ZimVAC, 2014) however, fail to confirm a positive relationship between tobacco output and food security. The Committee indicated that of the 22.5% poverty struck rural households, 5% were tobacco growing households. In 2008, Mashonaland West Province of Zimbabwe was ranked 3rd following Harare and Bulawayo Metropolitans area which are non-tobacco growing regions in terms of food insecurity.

A survey in the Madziwa area of Zimbabwe showed that many small farmers have built better houses and bought household goods, but they find themselves unable to stock their larders with enough food to last the season (Tsoroti, 2013). However, Maravanyika (1998) is quoted emphasising the value of tobacco to Zimbabwean agriculture offered returns seven times higher than cotton (the next best crop).

The majority of resettled smallholder farmers have and are diversifying into tobacco farming production since they perceive it to be more profitable and is expected to improve their livelihoods and food security status (Chivuraise, 2011). According to TIMB (2012) tobacco farming provides the most dependable source of income for smallholder farmers thereby improving household food security.

In addition, literature on the contribution of tobacco to food security at micro-level is still very limited most researchers looked at the contribution to household livelihoods in general with the major focus on improved income and asset base which sometime do not transform to household food security (Maravanyika, 1998; Chivuraise, 2011, Tsoroti, 2013).

These conflicting findings by researchers and the TIMB, raises the question of whether smallholder tobacco production is really benefiting the farmers in reducing food insecurity. Therefore, there is need to assess the level of household food security of the tobacco growing regions in Zimbabwe.

1.2 Research questions

In an attempt to respond to the broad question of whether tobacco farming has an impact on food access, the research seeks to address the following specific questions: -

1. What is the level of household access to food in the tobacco growing regions of Zimbabwe?
2. Is there there is any significant variation in food access among the tobacco and non-tobacco growing households in the tobacco growing regions of Zimbabwe?
3. What are the determinants of household food access in the tobacco growing regions of Zimbabwe?

1.3 Objectives of the study

1.3.1 Main objective

The main objective of the research is to analyse household food access in tobacco growing regions of Zimbabwe.

1.3.2 Specific objectives

The study is under pinned by the following three (3) specific objectives:

1. To determine household access to food in tobacco growing regions of Zimbabwe;
2. To determine if there is a significant variation in food access among the tobacco and non-tobacco growing households in the tobacco growing regions of Zimbabwe;
3. To determine factors affecting household food access in the tobacco growing regions of Zimbabwe.

1.4 Research hypotheses

1. There is a significant variation in household food access between tobacco and non-tobacco growing households in the tobacco growing regions of Zimbabwe.
2. Farming experience, gender, age of the family head, household size, types of farming activities (Tobacco production), annual household income, size of arable land, farm size and duration of food programme significantly affect household food access in the tobacco growing regions of Zimbabwe.

1.5 Significance of study

The research study aims to contribute to the knowledge gap of household food access levels of smallholder farmers in tobacco growing regions of Zimbabwe. This emerging research study need to be undertaken now in order to support informed decision making and evidence-based policies, programs and services in the future by various stakeholders. The research findings, conclusions and recommendations on food access in tobacco growing regions of Zimbabwe will contribute significantly to the advances to be made towards improvement of food access in other farming communities across Zimbabwe by filling the current information gap. The research will also bring out the trends and knowledge gaps in the food security field, highlighting opportunities for future research.

Whilst food security analysts' will be able to launch into systematic reviews that can assess and synthesize what is published, in this study research field can help to identify what is not published, or under researched. Central government should implement food policies that encourage easy food access both physically and economically.

The Ministry of Lands, Climate, Water, Agriculture and Rural Resettlement will be able to use the results from this study to evaluate the current agricultural policies. The ministry should consider its budgetary allocation for the development of rural infrastructure, irrigation schemes, and give proper advice on sharing these resources to enhance food access. The study findings will translate into crucial information valuable to the officials in finance and economic development sector because it will help in determining the allocation of social welfare budget for tobacco growing regions.

The traditional leaders, public service, labour and social welfare personnel are key stakeholders in the food system thriving to maintaining welfare and implementation of social safety nets and welfare programmes, access and distribution of social protection programmes, have influence in determining social welfare goods hence will need to food access knowledge. The farming sector should use the research conclusions to enhance their livelihood through the adoption of reported success from other farming regions for a sustainable agriculture entrepreneurship or other income generating which might be practiced in the area of study.

The study results shall be beneficial to the Grain Marketing Board which is responsible for acquisition (from local and external sources), storage and distribution of grain to ensure national food security and has also the power to distribute grain to millers and final consumers as silo products will be assisted in making informed decision in terms of quantities and prices of staple food crops based on the known food access information across the rural areas.

The study will generate essential information for the Non-Government Organisation (both local and International) who are involved in advancing food security and social wellbeing of communities. The local government and national housing ministry which coordinates and controls the distribution of government social protection programmes, drought relief resources and emergencies should find the study to be useful and important in influencing their decisions regarding food access issues.

Local governments and planning agencies should integrate food accessibility considerations into the community design process (land use planning, zoning, and the design of new community developments). Local leadership should use the study results to determine which organisations to collaborate with in order to initiate assistant programs that support and promote affordable foods access options to the community. The Department of Agritex would use the study results to allow the expansion of state and local projects designed to promote food access in rural areas.

1.6 Scope / delimitations and limitations of study

The results of this research cannot be generalised across the nation since it only focused on one district of one province of the 5 tobacco growing provinces. The researcher further confined the study to one district in the province. This study was a self-funded project and as such the researcher conducted a few (35) questionnaires for the pilot study, which might not have been enough to adequately shape questionnaire. Wherefore, a mixed method approach was necessary so as to validate the collected data.

This research was primarily concentrated on the food accessibility pillar of the food security dimension. The major constrain of the study was the time frame within which it had to be completed. Another hindrance was some farmers who were not forth coming to release certain information which they consider to be confidential. Respondents' willingness to report information as accurately as possible was an impediment. The study used and relied on a recall method by the heads of households in the responses to their experiences of food access problems within the past 30 days prior to the start of the study. Respondents' willingness to report information as accurately as possible could have biased data due to difficulties in recalling information. Hence the information obtained could be affected by the memory of the respondent since the time period between their experiences and the survey period could be relatively long. The information could have errors that resulted from respondent bias. Therefore precaution was taken to ensure that the results obtained in the study were reasonable and more accurate.

1.7 Outline of Thesis (Organisation of the study)

The research is divided into five separate chapters. Chapter one covers an introduction to background of study, problem statement, objectives, research questions, justification, delimitations and limitations of study. Chapter two entails the literature review of a number of subjects related to the research. Chapter three details the methodology used in the study, description of the study sites, research design, the sampling procedures, data collection and analysis. Chapter four gives an account of the household food access in tobacco growing regions of Zimbabwe, the methodology used in the research, discussions, recommendations and conclusions. The fifth and final Chapter gives a summary of the research, conclusion and recommendations based on the findings of this particular piece of work.

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CHAPTER 2
LITERATURE REVIEW

2.0 Introduction

In this section of the study the researcher makes a review of existing literature related to tobacco production and food security. Global, continental, regional and national statistics on food security is shared in this chapter. Possible causes and solutions are also dwelled upon.

2.1 Definition of terms

Food security is said to exist, "when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (World Food Summit, 1996). This is the widely accepted definition of food security within both academic and policy circles and also among food security practitioners within the donor community (USAID (2009), FAO-WFS (2009), World Bank (2003), Jacobs (2009), Coates (2007), Hoddinott & Yohannes (2002). The concept of food security has four (4) widely accepted dimensions which have been the focus of much research and policy analysis. These are: availability, accessibility, utilization and stability, Oni (2010), Batatunde (2007), Bishir et al (2012).

Smallholder farmer is a farmer who rears livestock and grows crops normally for subsistence purposes selling excess on a 6 hectares or less using family labour.

2.2 Pillars of food security

Food security is a multi-dimensional phenomenon, comprising of the following four pillars or components.

i) Food availability component

The World Food Programme defines availability as "The amount of food that is present in a country or area through all forms of domestic production, imports, food stocks and food aid" WFP (2009). Riely et al 1995, confirms that the term tends to be applied to food available at a regional or national level rather than at the household level, which can lead to some confusion as the word "availability" sometimes is used at the micro-level. Availability refers to the physical existence of food. On national level food availability is a combination of domestic food production, commercial food imports and exports, food aid and domestic food stocks. On household level food could be from own production or bought from the local markets

ii) Food access component

The World Food Summit defines access as having "physical, economic and social access". Many people only consider access within an economic or financial context, particularly since the 2005 Niger food crisis and the start of food price volatility in 2008. The World Food Programme defines food access as "A household's ability to acquire adequate amount of food regularly through a combination of purchases, barter, borrowings, food assistance or gifts" (WFP, 2009).

Food access consists of three elements, which are physical, economic or financial and socio-cultural. The physical dimension can be illustrated by a situation where food is being produced in one part of a country but an inefficient or non-existent transport infrastructure means that food cannot be delivered to another part suffering from a lack of food. Infrastructure such as roads and bridges can also affect physical access to markets, fields, grazing land and work opportunities. This usually impacts on the whole community equally, rather than on only some households within the community.

From the economic viewpoint, food security exists when people can afford to buy sufficient food. The idea that food insecurity arises when food is available but people are unable to afford it is still quite a recent development in the history of food security. A further economic consideration is the importance of market systems to ensure access to food as OXFAM points out: "Even in rural areas most people, and especially the poor, rely on market systems to provide food and essential goods and services but also for selling their produce" (OXFAM, 2007).

The third element is the socio-cultural dimension which arises when food may be physically available and the potential consumer has the money to buy the food but is prevented from doing so for being a member of a particular social group or even gender. Social conflict and civil strife can seriously disrupt food production and lead to the loss of livestock for example with dire consequences for a household's future food security (Riely et al. 1999).

Food access refers to the affordability and allocation of food, as well as the preferences of individuals and households. The UN Committee on Economic, Social, and Cultural Rights noted that the causes of hunger and malnutrition are often not a scarcity of food but an inability to access available food, usually due to poverty. Poverty can limit access to food, and can also increase how vulnerable an individual or household is to food price spikes.

Access depends on whether the household has enough income to purchase food at prevailing prices or has sufficient land and other resources to grow its own food. Households with enough resources can overcome unstable harvests and local food shortages and maintain their access to food.

There are two distinct types of access to food namely, direct access, in which a household produces food using human and material resources, and economic access, in which a household purchases food produced elsewhere. Location can affect access to food and which type of access a family will rely on. The assets of a household, including income, land, products of labour, inheritances, and gifts can determine a household's access to food.

However, the ability to access sufficient food may not lead to the purchase of food over other materials and services. Demographics and education levels of members of the household as well as the gender of the household head determine the preferences of the household, which influences the type of food that are purchased. A household's access to enough and nutritious food may not assure adequate food intake of all household members, as intra-household food allocation may not sufficiently meet the requirements of each member of the household.

The USDA adds that access to food must be available in socially acceptable ways, without, for example, resorting to emergency food supplies, scavenging, stealing, or other coping strategies.

Therefore, the access that the researcher will be focusing on is farming grown or purchased by the household.

The problem of food insecurity is not only caused by insufficient supply of food, but also due to the lack of purchasing power and access at national and household levels. Therefore, despite gains in global food production and food security over the last three decades, still more than 800 million people are undernourished and almost all of them belong to the developing countries.

Due to higher food demands and reduced crop productivity, the higher food prices may further negatively affect the food access and availability for low income and already poor households. The food security gains are not transferred at local level due to complex food supply chain system and prevailing risks and vulnerabilities along the supply chain.

The absence of proper food transport infrastructure and little access to food and market are some of the many factors that can affect food insecurity. Food security situation at local level may be improved by focusing on access to food and food distribution systems. Better food distribution system mainly depends on food and market access. Accessibility refers to 'ease to use' or 'openness to' to a certain facility. Market accessibility could be considered as one of the most important factors affecting rural food security. It is often linked with various other stakeholders e.g. processors, traders, and retailers. Being the producers and consumers at the same time, market access plays two-way function for rural households.

On one hand they use the market to buy inputs or to sell farm produce while on the other hand, they use it to buy food and non-food items in order to sustain their living standards. Market access may be hindered due to long distances from farm to market, transportation cost and market information. Hence, better infrastructure and easy market access can play an important role in sustaining local food security through reduced transportation cost and food prices.

Market access could be defined in various ways like using proxies such as travel time, distance and cost. In addition to market access, access to other institutional services such as extension and credit are also important to enhance local access and utilization of food. To date, a few studies have been conducted focusing on the different dimensions of rural food security in Pakistan. However, little focus is given to the role of market accessibility in enhancing access to food and related food security of rural households. Therefore, keeping in view the existing research gaps, this study aims to investigate the impact of market accessibility on rural household food security along with causes of food insecurity.

The Overseas Development Institute (ODI) briefing paper (1997) explains that the broad concept of food security and the definition given by the World Food Summit indicates that poverty is a major cause of food insecurity and its eradication will improve food access to many people. It also recognizes other essential factors such as corruption, terrorism, conflict and environmental degradation contribute greatly to food insecurity. Web *et al.* (2006) explain that these aspects of food security are in due order in the sense that food availability is necessary but it is not enough to guarantee that there is access to food. Food access is, in turn, necessary but not sufficient ensure that food utilization occurs.

Food access, which is usually measured at the household or individual level, is influenced by three main factors according the USAID conceptual framework. These include own food production, market purchases and food transfers. Market purchases are affected by the prices of food and the cash income available to households. Hence a high purchasing power is relevant for households to access food. On the other hand, food production levels and the cash income obtained by households or individuals is largely affected by the combination of resources available to these households be it natural, capital, community or human resources. Food transfers are those obtained from governmental or non-governmental organizations, community support systems and food banks.

In addition to the three main sources through which food is accessed, the World Food Programme's (WFP) household food access conceptual framework highlights other food access means such as gathering, fishing or hunting. These are usually food harvests from the natural environment. Households could generate cash income sales of food from their own production, gathering or hunting from the wild, or sales of food receipts. Other prominent sources of cash income include formal employment, direct cash transfers, or engaging in trading activities. These incomes are necessary because they are used in financing food purchases and non-food expenditures including the accumulation of assets for the household.

Household access to food is a complex phenomenon. The Comprehensive Food Security and Vulnerability Analysis (2009) of the world food programme (WFP) defines household's food access as the ability of the household to acquire food regularly through one or a combination of home production and stocks, purchases, barter, gifts, borrowing, or food aid. Food access in a rural environment will include the ownership of land to produce food or the having a reliable source of income to secure food.

Schönfeldt (2003), in his book entitled Fundamentals of Nutrition Security, explained four main dimensions of food access. These include: -

a) **Physical access** – this refers to the availability of physical infrastructure such as markets, road transport facilities and food distribution.
b) **Economic access** – refers to the affordability of food. It centers on whether people have the money to purchase or grow their own food.
c) **Social access** – refers to food that is culturally acceptable or that fits into the diet of the community.
d) **Technological access** – refers to the technological facilities that a household has to prepare or preserve food. For instance, the availability of electricity or firewood to cook food.

According to Webb *et al.* (2006), there are no exact measures of food access and hence recent studies have therefore focused their attention to unique behaviours that are known to reflect not only increased severity in food stresses but also taking into account the actual experiences of people becoming hungry. Swinsdale and Bilinsky (2006) indicate that the collection of household data such income and food expenditures to evaluate food accessibility are not only expensive and technically challenging but also time consuming as well.

Current food security studies indicate that there are universal experiential conditions of food insecurity which can be measured across different cultures in different countries (Kirkland *et al.* 2011). According Coates *et al.* (2006), there are three main conditions that reflect universal experiences of the problem of food insecurity. These conditions include insufficient food quantity, inadequate food quality, and the uncertainty and worry about food.

There is therefore a major shift of focus from objective measures of food insecurity to more subjective or experiential approaches. Subjective approaches concern the collection of information about how individuals express their own and their household members' perception and responses to food insecurity (Webb *et al.* 2006). Notable subjective or experiential approach to assessing household food access is the use of the household food insecurity access scale (HFIAS) developed by the USAID funded food and nutrition technical assistance (FANTA) project.

The HFIAS is premised on the notion that the experience of food insecurity by households tends to cause predictable reactions as well as responses that can be captured and quantified through a survey (Coates *et al.*, 2007). According to Deitchler *et al.* (2011), the HFIAS reflects the three universal domains of the experience of inadequate household-level food access: anxiety about household food supply; insufficient quality, which includes variety and preferences; and According to Swinsdale and Bilinsky (2006), the HFIAS therefore serves as a universally appropriate tool used for assessing the access component of household food insecurity in different cultural settings in different countries.

The advantage of using HFIAS is that, it tends to be cost effective, more sensitive to changes in household food insecurity and also user friendly (Kirkland *et al.*, 2011). The same authors argue strongly that even though the HFIAS is a good measure of household food insecurity, it should not be used in isolation but rather be used with other relevant indicators such as dietary diversity and coping strategies so that accurate identification of more vulnerable households can be made. Their argument was based on the fact that the choice of a food security indicator used in a study matters in identifying the households that are more vulnerable or at risk.

Dietary diversity is another measure of household food access. Hoddinott and Yohanne (2002) define it as the number of individual foods or food groups consumed over a given period. It can be measured at the household level or at the individual level. An analysis of the food and nutritional technical assistance project by Hoddinott and Yohanne (2002) has established that dietary diversity is a good indicator of the access dimension of household food security. The same authors indicate that household dietary diversity is a reflection of the household's economic capacity to consume a variety of foods. The use of dietary diversity as a proxy indicator of household food access has several advantages compared to other indicators. The authors emphasized that a high dietary diversity is highly correlated with factors such as caloric and protein sufficiency, the percentage of animal protein and household income. Dietary diversity is also an attractive indicator because data gathering is quite straightforward. While household dietary diversity reflects the household's access to food, the individual dietary diversity, on the other hand, serves as a proxy measure of the nutritional quality of the diet of an individual. There are no established rules concerning the best recall period to be used in dietary diversity studies.

iii) Food utilisation pillar component

The World Food Summit's definition of utilization (the third element of food security) is "safe and nutritious food which meets their dietary needs". The availability of and access to food on their own are not enough, people have to be assured of "safe and nutritious food". The food consumed has to provide sufficient energy to enable the consumer to carry out routine physical activities. Utilization also covers factors such as safe drinking water and adequate sanitary facilities to avoid the spread of disease as well as awareness of food preparation and storage procedures. Utilization therefore covers a range of aspects that hinge on the consumer's understanding of what foods to select and how to prepare and store them.

iv) Stability component of the food security concept

According to the World Food Summit, stability must be present "at all times" in terms of availability, access and utilization for food security to exist. Stability is the ability to sustain each of the other dimensions over time (Webb et al., 2006; Upton et al., 2016). The literature distinguishes between chronic food insecurity where food needs cannot be met over a protracted period of time and transitory food insecurity, where the time period is more temporary (Maxwell and Frankenberger 1992).

The food security framework comprises a physical determinant (the first three elements) and a temporal determinant (the fourth). Food might be available but that does not determine access; similarly, access might be viable but does not guarantee utilization and all three can be disrupted by a lack of stability caused by climate change, conflict, unemployment, disease or other factors. Stability or the lack of it can affect any or all of the other three components of the food insecurity framework.

According to World Food Summit (1996) Food security is said to exist, "when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Faridi and Wadood (2010) defined food security as when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. This definition looks at all levels of food security, individuals, households, community, national and regional. Household food security as the main focus of this study can be considered as the application of food in/security concept at the family level, with individuals within households as the focus of concern.

FAO (2002) stated that, "Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". The World Bank (1986) defined food insecurity as, 'the lack of capability to produce food and to provide access to all people at all times to enough food for an active and healthy life". It was further defined by Gebre (2012) and Carter et al. (2010), as "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways"

2.3 Food security measurement and indicators

Measuring and defining food security is a difficult task. The most important household food security indicators are: availability of food in local areas, availability of agricultural inputs, agricultural production, market infrastructure, access to common resources, climatic factors, especially rainfall levels, agro-ecological disparities, stability of food supply and production, community social networks, presence of weather and crop forecasts, food balance sheets, pest management and local and regional conflicts (Mudefi, 2011).

Current research agrees that food security has four central concepts: food availability, food access, food utilisation and stability (Webb *et al*., 2006). There is still not a universally accepted tool of measurement. Today most measures look at household level of food security and this can be done in multiple ways.

Measuring household food security can include looking at caloric intake, health measures, or food expenditure. These tend to be measured by surveys, which have multiple methods. Food security can be measured by calorie intake per person per day, available on a household budget. The objective of food security indicators and measurements is to capture some or all of the main components of food security in terms of food availability, accessibility, and utilization adequacy.

The food availability component (production and supply) and utilization/ adequacy (nutritional status /anthropometric measurement) are easier to estimate and, therefore, more popular, accessibility (the ability to acquire the sufficient quantity and quality of food) remains largely elusive.

Some research identified nine indicators and grouped them in three broad categories: - experience-based, coping strategies, and dietary diversity. These indicators only capture the quantity and quality components of food access, none of the indicators capture information on safety or cultural acceptability of food access.

Amongst these indicators are: - Household Dietary Diversity Scale (HDDS) measures the number of different food groups consumed over a specific reference period (24hrs/48hrs/7days);

Food Consumption Score (FCS) are often considered indicators of both quantity and quality. The FCS is the other measure commonly used by the World Food Programme for assessing and monitoring of food security, but they have not been validated for the latter;

Household Food Insecurity Access Scale (HFIAS) continuously measures the degree of food insecurity (inaccessibility) in the household in the previous month. The HFIAS is among the commonly used proxies of food access; Household Hunger Scale (HHS) - measures the experience of household food deprivation based on a set of predictable reactions, captured through a survey and summarized in a scale and Coping Strategies Index (CSI) which assesses household behaviours and rates them based on a set of varied established behaviours on how households cope with food shortages.

The ZimVac (2012) food security assessment uses the Household Economic Access (HEA) as proxy of the access dimension. HEA sums up the ways a household acquires incomes, savings and asset holdings that helps in meeting its food and non-food needs. The HEA is on the other hand not a sufficient indicator and tells us nothing about the household economic productivity.

Considering a household, individual or community as food secure or insecure differs among individuals, analysts and organisations. The ZimVac (2019) on the other hand considers a household that has no access to or has the capacity of attaining the minimum of 2100 kilocalories per head per day as being food insecure. The United States Agency for International Development (USAID) as quoted in Ignowski (2012) considers any household that has need for food aid for at least one quarter of the year starting in January as being food insecure in Zimbabwe. This is the nature of the definition for those in the humanitarian operation but falls short of recognizing food security as a short term problem to the society.

This research study considered food access in Hurungwe at a given point in time regarding access as measured by HFIAS. The researcher adopted this because in some areas a household could be food insecure only on a very short period of time such as the past twenty-four hours and or the past 7 days. It also was such that there were several infants, children, minors and the elderly that could not endure the long periods that qualifies them to be food insecure as per the USAID standard.

2.4 Determinants of food accessibility

i) Spatial factors

There are many factors that could influence household food accessibility. We can distinguish two main types, spatial and non-factors. For instance, a food access disparities research that focused on differences in food store access by Bodor *et al.* (2010) found that poor access to stores that shelve fresh produce may significantly limit resident's opportunities to purchase and consume fruits and vegetables. This shows the significance of store access as well as in-store contents.

Dai and Wang (2011), who defined food accessibility as the ability of a person to gain the services of food providers, examined inequalities in spatial accessibility to food and its association with location (urban or rural) and non-spatial factors (socioeconomic). They argued that food accessibility differ across spatial and non-spatial dimensions. They explained that when there is an uneven distribution of food providers in an area in terms of geography, it tends to lead to inequalities in accessing food.

A case study by D'Haese and Huylenbroeck (2005) examined the purchasing patterns of rural households in the Transkei region of South Africa. They argued that since poverty was rife among the rural households, they tend to carefully plan their shopping and also maximize the utility of their incomes. Majority of the households made their food purchases from the nearest supermarket which is usually outside of their villages.

ii) Non–spatial factors

Wang and Luo (2005) indicate that household socio-economic characteristics such as ethnicity, education, age, gender, unemployment rate and income are some of the non-spatial factors that could affect accessibility. A food access disparity study by Wang and Dai (2011) revealed that low-income, carless and linguistically isolated families (cultural barrier) in rural areas have a disadvantage in spatial food access.

Bashir *et al.* (2012) assessed the food security conditions of rural landless households in twelve districts in the Punjab province in Pakistan by the use of a binary logistic regression analysis. Their study found that the monthly income of households, livestock assets and education level of household heads positively impacted on household food security level. On the education, it found that household head with education up to middle (8yrs) and intermediate (10-12yrs) school levels were more food secure. However, the age of household head and the increasing household size had inverse relationships with household food security.

The authors argue that income appears to be the most important determinant of food accessibility since food security relies heavily on having more access to food and having access to food finally depends on an individual's purchasing power to command enough food that is needed. The results from the study of Bashir *et al* (2012) confirms earlier studies by Idrisa *et al.* (2008) on farming households in North-part of Nigeria who reported that households with low level of education, larger family sizes and low levels of income were mostly affected by food insecurity.

A study by Modirwa and Oladele (2012) on household food security among male and female headed households engaged in farming in the rural part of the Eden district in the Western Cape of South Africa. The study aimed identifying the factors affecting the food security level of the households. Poor access to markets, storage facilities, land tenure systems and lack of credit were the major factors that affected household food security.

2.4.1 Global food security trends

The study launched by the United Nation's Food and Agriculture Organisation (2002) states that there is enough food globally for a growing world population and this situation will continue until 2030 although hundreds of millions of people will remain hungry in developing countries and one sixth of the developing world's population suffer from hunger and fear of starvation.

According to Knight (1998) the reason for hunger is poverty which Myers (1999) defines as an absence, deficit or lack of access to social power, powerlessness and lack of freedom to grow. Food is always available to those who can afford it while the poorest remain hungry. People in the world are hungry not because of lack of food but because they do not have ability to acquire it and because distribution is not equitable. The hungry are trapped in severe poverty and they lack the resources to access enough food to nourish them. Shifts in the global economy, including rises in global food and oil prices, can affect food security throughout the world, with especially severe effects in low-income countries.

Table 1. Prevalence of under nourished % in the world 2005 – 2018

	2005	**2010**	**2015**	**2016**	**2017**	**2018**
Africa	21.2	19.1	18.3	19.2	19.8	19.9
Northern Africa	6.2	5.0	6.9	7.0	7.0	7.1
Sub- Saharan Africa	24.3	21.7	20.9	22	22.7	22.8
Eastern Africa	34.3	31.2	29.9	31	30.8	30.8
Middle Africa	32.4	27.8	24.7	25.9	26.4	26.5
Southern Africa	6.5	7.1	7.8	8.5	8.3	8.0
Western Africa	12.3	10.4	11.4	12.4	14.4	14.7
Asia	17.4	13.6	11.7	11.5	11.4	11.3
Latin America and Caribbean	9.1	6.8	6.7	6.3	6.5	6.5
Oceania	5.5	5.2	5.9	6	6.1	6.2
Northern America and Europe	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5

Source FAO. (2019)

According to the World Hunger (2000) the World Health Organisation estimates that one third of the world is well fed, one third underfed, one third starving and over four million die of hunger every year.

2.5 Influence of tobacco production on global food security

There are an estimated 850 000 growers of tobacco in India, with farming characterized by small family farms. Studies on the Tobacco Industry in Andhra Pradesh found that marginal and small tobacco farmers depend on this crop as the main source of their family income and of livelihood, particularly for food which accounted for about 68% of the annual household expenditure.

In Brazil, for example, some 135 000 family farmers produce tobacco as their main economic activity. In the 2000/2001 crop year average gross income per family farmer reached R$ 9,165 (US$5,000). Tobacco in Brazil provides higher net returns per hectare than maize or edible beans.

In Malawi tobacco has been, and continues to be, the dominant cash crop in the economy accounting for approximately 63% of the country's total export earnings World Trade Organization (WTO, 2002). The focus of the Malawian government policies shifted in support of the majority smallholder farmers which in turn enabled them to boost their production of tobacco and generally led to increase in income obtained by smallholder farmers and improved their food security status (Jaffee, 2003).

In Mozambique tobacco is one of the major sources of income, uplifting the welfare for more than 129,755 farmers in the central and northern regions of the country. On average, the tobacco sub-sector contributes close to 34% of the total agricultural exports and almost 4% of the total exports of goods and services (Benfica et al., 2004). Overall, tobacco is one of the most important agricultural export crops in Mozambique, accounting for 7.8% of total exports in 2011 (Hu and Lee, 2015). The government believes that tobacco, as cash crop, enables farmers to increase their purchasing power and raise their household standard of living above poverty level according to Miyata et al. (2009).

Jerie and Ndabaningi (2011) reported that tobacco is the most important cash crop and a potential major earner of foreign currency in Zimbabwe. Results of the survey carried out in Zimbabwe by (FAO, International Fund for Agricultural Development (IFAD) and World Food Programme (WFP), 2013)) revealed that about 98% of households which depend on cereal stocks alone were food insecure as of 1st April 2013. Eighty-five percent (85%) of food insecure households were involved in own food production whilst those households who obtained income from cash crops in addition to food crops had only a prevalence rate of food insecurity of 81%.

2.6 Prevalence of food insecurity in Zimbabwe

Although smallholder farmers play a critical role in food and nutrition security in Zimbabwe, with their production accounting for the bulk of the country's food, they themselves often struggle with poverty and food insecurity. In 2012, 76% of rural households lived below the poverty line.

Small scale farming has been important for food security, contributing 42% of total maize production (the staple in Zimbabwe) in 1980 increasing to 60% in 1985 and then 70% in 1999. Livestock and livestock products contribute significantly to the economy of Zimbabwe, with cattle accounting for 35-38 % of the Gross Domestic Product (GDP) contributed by the Agricultural Sector. It is estimated that up to 60 % of rural households own cattle, 70-90 % own goats, while over 80 % own chickens (Rukuni, 2006). The importance of livestock in rural livelihoods and food security lies in the provision of meat, milk, eggs, hides and skins, draught power, and manure.

Zimbabwe is ranked amongst the most food insecure countries in SADC region at 13%, Malawi and Swaziland 11%, Angola 10% and Lesotho 39% food insecure. Affected households are relying on negative coping strategies such as skipping meals or food rationing. The increase in school dropout rates have been attributed to food scarcity. Since the turn of the millennium, Zimbabwe has failed to meet its annual cereal requirements. Domestic cereal output for human and animal consumption has persistently been either declining or fluctuating below required levels of about 2.2 million tonnes and 400 000 tonnes for maize and wheat respectively (Ministry of Agriculture, Mechanisation and Irrigation Development, 2007).

This has resulted in increasing levels of food insecurity at both the national and household levels. The subject of food insecurity has attracted attention the world over, given its direct link to malnutrition which leads to poor physical and mental health. In Zimbabwe, food security, defined in terms of availability of maize as the staple food product, has remained an issue of great concern in view of the increased incidence of drought-related hunger.

The fall in returns from food crops has led farmers to increase their production of non-food cash crops. The small-scale farmers have moved in to grow food crops for subsistence, with surpluses being sold. As such, the area under food crops has been increasing, although at a lower rate than for cash crops (Mangoyana and Meda, 2001). The agricultural sector in Zimbabwe provides income to almost 75% of the population, accounts for 30% of formal sector employment and 40% of total national exports (Rukuni and Eicher, 1994). In 1999, the SADC established a Regional Vulnerability Assessment Committee (RVAC), a multi-agency committee that has spearheaded critical improvements in food security and vulnerability analysis at regional and country levels.

The RVAC supported the establishment of ZIMVAC in Zimbabwe in 2002. Mudimu (2003) states that Zimbabwe has never had neither a clearly articulated agricultural policy nor one on food security until 2002 when the country came up with the Zimbabwe Food Security and Strategy for presentation at the FAO World Food Summit, 2002. Past strategies were based on political reactions to unfolding situations resulting in inconsistencies whereby one strategy contradicted another with respect to food security. Due to lack of a food policy, the strategies adopted did not follow or develop into a coherent framework for addressing food insecurity in the country.

In Zimbabwe, post-independence (1980) agricultural policies focused on developing a high degree of food security through production while improving the welfare of the long-marginalized rural population. Government directly stimulated agricultural production by way of policies and measures on land, water, infrastructure, credit and technology. These measures include irrigation development, input support, and provision of tillage services, credit and strengthening of research. It also established depots and collection points, and ensured guaranteed prices and markets.

Indirect stimulants in the form of subsidies and income policies were employed to stimulate production and demand. During the same period, food insecurity at both household and national levels fell. With the advent of ESAP period (1991-1996), there was a shift in food security policies. Liberalization brought with it unsustainable chronic increases in food prices throughout the ESAP period. Prior to the year 2000, the Ministry of Agriculture made attempts to develop strategies on food security which were later aborted due to various reasons. These include the Zimbabwe Agricultural Policy Framework (1995-2000) and the Agricultural Sector Management Programme. As a result, government has reverted to interventionist policies in an attempt to achieve food security. For example, Statutory Instrument 350, 1993 under the

Control of Goods Act requires a permit for the importation and exportation of cereals. These import and export controls have been imposed and relaxed time and again.

As the main source of livelihood for the majority of the population, the performance of agriculture is a key determinant of rural livelihood resilience and poverty levels. The smallholder sector produces 70% of staple foods (maize, millets, and groundnuts). Zimbabwe is considered a low-income, food-deficit country, ranked 154 out of 188 on developing countries on the Global Hunger Index UNDP Human Development Index (2016) which measures progress and failure in the global fight against hunger. Poverty is most prevalent in rural areas, with 76% of rural households living on less than US$1.25 per day.

According to the 1995 annual Poverty Assessment Survey Study (CSO, 1995), 42% of the citizens were classified as very poor (earning less than the level of income which people need to meet their basic food needs) with communal area residents having the highest level of poverty (71%). In a sample survey conducted in 2000 (Agri-Optima, 2000), 89% of the interviewed households reported food shortages for almost the whole year. The proportion of hungry households had more than doubled from 16% in May 2015 to 37 percent in January 2016.

The WFP Zimbabwe Country Director, Eddie Rowe on September 24, 2019 in Harare reported that, the United States Government, through United States Agency for International Development (USAID) had provided additional US$86.9 million funding to ensure that more than one million rural Zimbabweans have access to adequate food supplies between October 2019 and April 2020.

Table 2. Food insecurity by province in Zimbabwe between 2011/2019

Province	**% Food Insecurity 2011/12**	**% Food Insecurity 2012/13**	**% Food Insecurity 2013/14**	**% Food Insecurity 2017/18**	**% Food Insecurity 2018/19**
Manicaland	14	15	22	27	50
Mashonaland Central	10	17	20	22	47
Mashonaland East	8	10	17	28	52
Mashonaland West	7	16	13	20	56
Masvingo	16	28	33	34	48
Matabeleland North	16	30	40	36	58
Matabeleland South	16	30	32	30	54
Midlands	11	17	31	26	47
National	**12**	**19**	**25**	**-**	**-**

Source ZimVac (2019)

According to the ZimVAC Rural Livelihoods Assessment (2019), between February and May 2019, an estimated 31% of Zimbabwe's rural population (2,878,957 people) required urgent action to protect and save livelihoods, reduced food consumption gaps, and minimized acute malnutrition.

2.7 Food insecurity records of Hurungwe District and livelihood profile

Hurungwe district was identified as one of the most food insecure districts under the ZIMVAC Assessment programme.

Table 3. Household food security status by in Mashonaland West

District	Food Insecure Proportion (%)
Hurungwe	59,1
Makonde	59,7
Mhondoro – Ngezi	57,1
Kariba	54,8
Sanyati	64
Zvimba	48,1
Chegutu	51,3

Source ZimVac (2010)

In a study on livelihood zones profile in February 2010 by ZIMVAC report, livelihoods in Hurungwe can be described as an economy of cash and climate dependent food cropping combined with animal husbandry.

2.8 Livelihood overview patterns among communal Households in Zimbabwe

Achieving and ensuring food security still remains a challenge in Zimbabwe for rural communities whose livelihoods are farm-based. As noted by Matshe (2009): "Declining agriculture performance is a major driving force behind growing poverty among African smallholder farming populations, and its recovery offers the greatest prospects for rural populations to escape out of poverty." This means opportunities for rural non-farm employment and income generation remain key in contributing to increased food security.

Diversification in rural Zimbabwe takes many forms. Jackson and Collier (1991) observed that rural Zimbabweans often decide to change their crop mix or alter the balance between crop and livestock activities to spread the risk of income failure. A number of studies on income diversification in Zimbabwe have revealed that in remote areas, non-farm income sources increase income inequality but in areas better connected to the large urban markets, that it decreases income inequality.

An important study by Kinsey et al., (1998) on 400 resettled households in rural Zimbabwe over a 13year period and found that income diversification is a common coping strategy during times of drought. However, income sources that are easily tapped are low return activities such as day jobs or agricultural piecework.

In a study on Livelihoods and Poverty in semi-arid regions in Zimbabwe, Shepherd and Bird (2003) broadly highlighted that nonfarm and wage income were important income sources for a large proportion of households, and remittances for some. However, the main economic activities pursued by severely poor households differed substantially from those pursued by the non-poor, as did their major sources of income. Therefore, poor and severely poor households were much more likely to be solely engaged in farming or in a mix of natural resource-based enterprises, or in activities with low social status (casual labour), a high degree of drudgery (beer brewing, construction) or with low entry barriers and returns to labour (‘‘services’’).

For the livelihood portfolios where significant numbers of severely poor households were concentrated, there was a considerable range of incomes derivable from most livelihood portfolios, suggesting that no particular livelihood strategies were intrinsically any better than any others. Some of these portfolios were accessible to poor households included adding enterprises to a farm, or diversifying into nonfarm or wage employment wider range of livelihood options were open to men, allowing male-headed households to make use of their greater social and human capital to generate better returns in non-natural resource based activities.

Women headed households, on the other hand, tended to be crowded into a narrower range of activities, but those with the asset base (including human capital and entrepreneurial skills) to enable them to succeed would invest more strongly than men in the productive assets to make it possible for them to generate improved returns. (Shepherd and Bird, 2003).Access to assets, education, credit facilities and markets play a significant part in influencing the degree to which households diversify.

In agreement with Warren (2002), Barrett et al., (2001) and Hussein and Nelson (1998), availability of assets such as savings, land, labour, education, access to market or employment opportunities is a primary factor in determining a household’s capability to diversify. Among the main economic activities pursued by severely poor households were farming or a mix of natural resource-based enterprises, or casual labour, or beer brewing, construction with low entry barriers and returns to labour.

In many cases casual labour in other farms is the most common option for poor households. Its relative availability can be used as a proxy for access to income and food (ZIMVAC, 2010). Though enterprise-based diversification looks attractive because of its alleged capacity to promote more sustainable rural livelihoods, yet due to the higher investment and higher risk entailed by self-employment or enterprise development, temporary wage labour is often the first choice for impoverished farmers in need for diversifying their livelihoods (Warren, 2002).

Gender relationships at household level have meant that women have limited options for diversification than men. As noted by Ellis (2000) and Gladwin et al., (2001), gender relationships may constrain or promote access to some household assets or the mobility of certain gender and age groups. This means that the degree of involvement in diversification activities and the unequal distribution of their benefits vary between genders. There has not been much injection of non-farming income into rural areas that would have created demand for both industrial and agricultural products.

A number of constraints make businesses non-viable, namely, price controls, transport, inadequate rural infrastructure, and lack of telecommunications facilities. Faced with continued threat to agriculture, farming households are increasingly resorting among other things to selling of assets, reliance on social networks (including money lenders), NGO support (e.g., food aid, cash for work), petty trading/hawking and temporary migration (including exchange, work, support) as major adaptation strategies against climate induced problems such as drought.

2.9 key determinants affecting food security in rural and communal areas of Zimbabwe

A household’s access to food depends on where and who household members are, as well as the season. Thus, when considering food security data, it is important to take into account the parameters of location, main livelihood activity, socioeconomic status and seasonality. The “where” and the “who” also determine how policies, institutions and processes (the context) influence the extent to which assets can be accessed and used, and livelihood outcomes achieved. ‘Where’ refers to the geographic location, which determines the livelihood options, how easy it is to get to the markets to purchase and sell food or livestock or find work and other income generating activities.

Geographic location also determines the type of hazards households are exposed to such as drought, conflict or diseases, those affecting crops and livestock. ‘Who’ refers to the type of household and individuals, which is determined by the assets (human, political, social, physical, natural and financial). These traits determine what resources the household can use. Food insecurity can occur in situations where food might be available but not accessible due to the erosion of people’s entitlement to food (Borton and Shoham, 1991).

Following the work of Sen (1981), there is a critical distinction between the availability of food and people’s access to food. People’s entitlements to food arise from their assets, stores, networks and skills, from their own production, from selling their produce and labour, and from transfers (entitlements). People are food insecure when the combination of entitlements is not sufficient to enable the individual or household to acquire minimum food requirements.

Increasing food production nationally will not increase food security for people and groups without effective entitlements to that food (FFSSA, 2004). Entitlement refers to the set of income, assets, commodities with which households can establish control and secure their livelihoods. Consequently, households derive food entitlements from their own production, income, gathering of wild foods, community support, migration, etc.

‘Season’ determines the activities that people undertake to get food or to earn money, the prices they pay and the foods and income generating activities that are available to them. In this globalised era of the 21st century, many determinants of food security are trans-boundary and require multilateral agreements and actions for an effective solution. Food security and hunger alleviation on a global scale are within reach provided that technological innovations are accepted and implemented at all levels.

Food security remains a serious problem, especially in developing countries where the challenge of the sustainable food supply is exacerbated by the rapid rise in the population, limited access to food intake, infrastructural availability, vulnerability, price volatilities, protection measures imposed by the government, and other distorting influences monthly income, structure of the family (Bashir et al., 2013).

2.10 Conceptual / theoretical framework/s

In his 1798 essay Malthus argued that food insecurity, hunger, famine and starvation are caused by the decline in food output per head. He proposed that it is usually the increases in population that is often more than the increases in the food production which impacts on food in/security in any nation or community. This concept has been widely used across the world and even recommended by the FAO with a minimum of a daily calorie of 2100.

The working definition which is going to be used in this study is that; food security is attained when all people have economic, social and physical access to enough nutritious and safe food which meets their dietary needs for a healthy and active life at all times as defined by FAO (2002).

Livelihood strategies and food security tend to change with the passage of time as land distribution takes place as reflected by the historical time axis. Resettled smallholder farmers finds themselves with choices of either to engage in food crops production such as grains or cash crops such as tobacco farming. These livelihood strategies in turn will have a significant influence on the livelihood outcomes and consequently influence the food security situation for smallholder farmers in Zimbabwe. Livelihood strategies comprise of various household activities or behaviour patterns adopted and choices undertaken by household in order to meet their livelihood objectives (Doss, 2006).

There are three different ways which can be pursued by members of the household to meet their livelihood goals, which are farming activities, non-farming activities and migration with the given available resources. The main aim of all individuals is to maintain or achieve better livelihood outcomes as well as to improve their standards of living Department for International Development (DFID, 2001).

However specific objectives such as raising income or improving food security are identified according to the individual’s choice and desires. The obtained livelihood outcomes of different livelihood strategies will have an influence of the household’s food security situation over time.

The main objective of the research is to analyse household food access in tobacco growing regions of Zimbabwe.

2.11 Summary of literature Review

This chapter presents the background of the study area, including the characteristics of its population and climate. The chapter also provides an overview of the methods that were used to collect and analyse data. As noted in Chapter 1, these areas are located in Hurungwe District of Mashonaland West Province of Zimbabwe. Also, as indicated in Chapter 1, the objective of the study is to analysis the household food access in tobacco growing regions of Zimbabwe. However, this chapter also presents and justifies the research approaches that were adopted in the study. Thematic, correlation and multiple regression analysis were the main methods used in the analysis of data.

2.12 References

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CHAPTER 3
RESEARCH METHODOLOGY

3.0 Introduction

This section lays down the procedures adopted to establish factors accounting for food access level in Hurungwe district. Included in this chapter is the description of the study area, data collection, data analysis and presentation techniques that were used in this research study. The survey used the HFIAS tool as the food access measure. The actual measurements of the variables discussed in the previous chapter will also be highlighted. Data sources and their relevance will also be discussed in the chapter. The chapter therefore focuses on outlining the way the research objectives will be made operational.

3.1 Description of the study area

The research study was focused on the Mashonaland West Province which is one of the ten provinces in Zimbabwe situated North central 17^{O} 00\`S $30^{O}$ 00\`E. Zimbabwe is a small (390,000 square kilometres) land locked country in Southern Africa. The country lies between the Zambezi River in the north and the Limpopo River in the south, which are its main drainage systems. Zimbabwe is bounded in the north and east by Mozambique, in the north by Zambezi, in the south by South Africa and south west by Botswana (FAO, 2011).

Zimbabwe is divided into five natural regions, geophysically, in which the dominant natural factor conditioning agricultural production is climate, mainly rainfall. The physiographic features or natural resources of an area are among the major determinants of its production potential. These natural resources together with human and capital resources (socio-economic factors) determine the viability of the agricultural enterprise and the economic development of the area (Mushunje, 2005). Another important factor is also soil types.

The location of this research is a farming district named Karoi and is also known as Hurungwe district. Its main town, Karoi, is located about 203 kilometres by road, Northwest of Harare, the capital city of Zimbabwe. Hurungwe district is the largest of the seven districts within the province. According to Zim Stats (2012), the district covers an estimated area of 19,843km^2 which represents 0.05% of the total land area of Zimbabwe (390757km^2). The district has a population of 329,197 central statistical office (CSO; Zim Stats 2012) of which 164,711 are males and 164,486 are females. The average farm household size of the district is five (5).

Tobacco and maize are the main cash crops that are widely grown in the area. The District Headquarters are in Magunje which is a growth point. Tengwe is a farming town Southwest of Karoi town and Kazangarare is a growth point located 60 kilometres Northeast of Karoi town. The district is made up of 30 wards and the study was carried in 7 wards. The most formal economic activities in these area are farming, gold mining, buying and selling and informal SMEs.

Mutandwa and Gadzirayi (2008) pointed out that the area is located in natural region 2 and is considered one of the prime agricultural zones of the country. The annual rainfall ranges from 750 mm to 1000mm and is sporadically received during the period October to April, which is ideal for tobacco production.

Hurungwe District is being selected for research study because it contributes significantly to the local tobacco industry. Hurungwe district is the home to 38% of the smallholder tobacco farmers who produces 36% of the national tobacco yield (is the highest producing province followed by Mashonaland East at 30% and Mashonaland Central on third position at 26 %). Also, its average yield is equivalent to the national one of 1,700kg/ha (TIMB 2019).

The Province was chosen because it contributes significant amount (30 percent) of tobacco in the country (highest tobacco producing province with second highest Mashonaland Central on 26 percent third highest Manicaland on 23percent) and that the resettled smallholder farmers in the chosen district of Hurungwe survive mainly from income obtained from tobacco farming (Jerie & Ndabaningi, 2011). According to (RBZ, 2019) tobacco is the most important cash crop and a potential major earner of foreign currency in Zimbabwe.

Figure 1 Provinces and Districts in Zimbabwe

Source: world atlas 2016)

3.2 Research design

Research methodology is the study of methods used to obtain data from a research project (Bell, 1993). According to the American Heritage Dictionary (2000), methodology can properly refer to the theoretical analysis of the methods appropriate to a field of study or to the body of methods and principles particular to a branch of knowledge. Hence in this research the researcher used both the quantitative and qualitative methodologies to obtain information about the food access level in tobacco growing regions of Zimbabwe. The research is a survey conducted through administering a questionnaire, holding group discussions, interviewing key informants and observations.

3.3 Sampling Procedure

Initially, smallholder farmers comprising of A1 resettled, old resettlement and communal farmers, were purposively selected for the study. The reason for purposive random sampling, also known as subjective sampling, was to concentrate on locations with particular characteristics which could better be able to assist with the relevant research and households were randomly selected for interviews. Secondly, random sampling was then deployed using a hat method from a pool of qualifying respondents. Sampling with replacement was used during this study. This technique was employed only to capture a true reflection of the household economic characteristics of the population in the district area. A sample of 50 households was randomly selected from each of three main areas. A total of 150 respondents were therefore used for the study.

Data collection was conducted in the month of May 2020, using structured household questionnaires, Focus Group Discussion (FGD) and key informant interviews. FGD and key informant interviews were used to generate data that complemented the structured questionnaire by providing the explanations and issues behind quantitative data. One FGD was conducted with 8 participants, two from each of the six selected locations. The community group was conducted after the survey to support information on the questionnaire and other omitted household themes.

Before the formal survey was conducted, the questionnaire was pre-tested using twelve randomly selected household heads from all three areas. Pre-testing ensured that the questionnaire collected all the information required and it helped to improve the translation to the local language, which is Shona. The researcher who is Shona-speaking administered the questionnaire. To get an understanding of household food security and livelihood patterns in the area, key informant interviews were conducted, using the GMB, TIMB, Agritex Staff and councillors.

In general, the head of the household was interviewed, but if he/she was not present or available, then the spouse or an adult household member was interviewed. Each interview lasted on average 45 to 60 minutes. The surveys were carried out in a local language depending on the primary language of the household head. An important aspect of the data collected was internal quality control.

All procedures regarding internal quality control were established before the data collection. For instance, the FGD agreed on common definitions in the questionnaires before setting out to the field. The researcher would quickly crosscheck the accuracy and completeness of information daily during the evening. This was very important because it gave the researcher the opportunity to quickly rectify any mistake that would occur by going back to the households to verify the information from the respondents whenever necessary.

3.4 Data collection methods

Both primary and secondary data collection methods were used in this study.

3.4.1 Secondary data collection methods

Secondary data was used for literature review on tobacco production and food security issues. This data was collected with regard to socio-economic data and additional information concerning farming in Hurungwe. This information was mainly obtained from library textbooks, online journals, reports and newspapers.

3.4.2 Primary data collection methods

The primary data were gathered through the administration of questionnaires to respondents in the study area. It consists of both qualitative and quantitative data which was collected at the household level in all three areas.

3.4.2.1 Interviews

In this study, structured and semi structured interviews were a vital way of data collection because they are a very good way of accessing people's perceptions, thoughts, experiences and meanings. Hence they were appropriate for finding out respondent's knowledge and perceptions, and experiences vis-àvis their food access level.

They (interviews) are data collecting tools containing an organized or planned conversation with a view to explore the unknown information from the interviewee. Carter (1999) is of the view that an interview is a two way method which permits an exchange of ideas and information; it is unique in that it involves the collection of data through direct verbal interaction between the interviewer and the interviewee.

According to Cohen and Manion (2002) interviews can serve a number of distinct purposes which can be used as a means of gathering information about a person1`s knowledge, values, preference and attitudes and experiences highlighting their welfare and state of livelihood. Hence, the researcher to used them to gather detailed information on the experiences, knowledge as well as conditions of the people living in the communities under research. However, it should also be noted that interviews are time consuming since it takes time to interview the whole population sample. These interviews were conducted through the questionnaire, group discussions and interacting with key informants.

3.4.2.2 Passive observation

During the course of the study several observations were noted to complement other data collection methods used in this research. Though it was subjective to the researcher, it gathered data on size of land, granary size, other household business enterprises, physical infrastructure and assets found at household level.

3.4.2.3 Ethical considerations

According to Neuman (2000) research ethics are an organized, legitimate and moral way of conducting a research. It involves the application of fundamental ethical principles to planning, conducting and publishing of research.

The consent issue was clearly explained to every respondent before carrying out interviews stressing that the exercise was based purely on voluntary basis. According to Patton (2002) informed consent is the process through which respondents agree to undertake a research study after going through its procedures, risks and benefits. The objective of the seeking the participants consent was to indicate the purpose of the study to them and have their acknowledgement in agreeing to participate in the study. In carrying out any research, there is need to seek permission from the concerned parties. In other words, permission would be sought from the farmers and the key informants to carry out a study so as to make the research authentic and possible to conduct.

All resources used during this survey have been acknowledged and or referenced in order to give credit to the person (s) whose idea it is (intellectual property). The researcher made a commitment that no subsequent researchers in need of same data variables shall access the data gathered in this study to avoid violating the principles of consent and confidentiality. Confidentiality implies that besides the researcher no one will be given access to the data that was collected by the researcher.

In addition, the researcher promises that no data falsification or use of an inappropriate statistical technique was undertaken in order to enhance the significance of this research. The respondents in the study were given the opportunity to be anonymous by not including their grower's numbers which could be easily traced back to them. According to Christians (2000) the researcher has the obligation to keep the respondents' identity and keep their responses private. The researcher vow to maintain anonymity of respondents who participated in the group discussions, oral interviews and those who responded to questionnaires.

3.5 Data analysis

The data collected during the study was analysed both descriptively and statistically through two analytical tools which are the IBM Statistical Package for the Social Science (SPSS 22) and MS (Microsoft) Excel 2013. The T-Test, ANOVA, Correlation and multiple regression analyses were the main methods used in the analysis of data. The data cleaning steps involved checking duplicate entries, data inconsistency, and quality of data such as errors.

Content analysis were used to quantify content in terms of predetermined categories in a systematic manner. To this regard, the data was classified, summarised and tabulated in order to produce quantitative accounts of raw material in terms of categories. This quantitative method will enable the researcher to measure numerical comparison and statistical inferences. The qualitative methodologies gave the researcher an insight on the visible and tangible outcomes. There after this data was entered into a computer in order to be labelled and coded, counted and analysed.

3.5.1 Food access analysis

According Coates *et al.* (2006), there are three main conditions that reflect universal experiences of the problem of food insecurity. These conditions include insufficient food quantity, inadequate food quality, and the uncertainty and worry about food. The HFIAS reflects the three universal domains of the experience of inadequate household-level food access: anxiety about household food supply; insufficient quality, which includes variety and preferences. According to Swinsdale and Bilinsky (2006), the HFIAS therefore serves as a universally appropriate tool used for assessing the access component of household food insecurity in different cultural settings in different countries.

To determine household food access, the respondents were asked whether there were times during the past 4 weeks (one month) when members of their household went hungry because there was not enough food in the house. The HFIAS score was determined by asking a number of questions about access to food. This involved asking respondents whether any of the nine listed food insecurity-related conditions had occurred in the past 30 days. If the response was affirmative, the frequency of each condition was recorded. The options for frequency were rarely (once or twice), sometimes (3 to 10 times), or often (more than 10 times) over the past 30 days. The respondents were further asked whether the conditions listed in the HFIAS have occurred to the same extent, more often, or less often before the interventions were implemented.

In order to calculate the HFIAS, a value was assigned for each response to questions about the nine food insecurity-related conditions (never = 0, rarely = 1, sometimes = 2, and often = 3), and these values were summed to obtain the HFIAS. The maximum possible score for a household was 27 (answered “often” for all nine conditions) and the lowest possible score was zero (answered “never” for all nine conditions). Therefore, the higher the score, the more food insecurity (in terms of access to food) the household had experienced.

In order to understand the contextual issues behind food security, general underlying socioeconomic conditions were captured through an analysis of the captured questionnaires, focus group discussions, key informant interviews, and general observations. This enabled a situational analysis to be performed to provide a context for understanding food security conditions.

3.5.2 Factors affecting household food access

In order to determine the factors affecting household food access, the multiple linear regression was used. A regression model was constructed to observe the variables that influence the dependent factor, which is food access score (HFIAS) in this study (since the dependent variable was numeric and normally distributed). The variables used in the regression model are as follows:-

Model specification: For the model that was to be estimated, the functional form was given as below with the exogenous variables highlighted further below.

$$Y = \beta_0 + \beta_1 \mathbf{hhgen} + \beta_2 \mathbf{age} + \beta_3 \mathbf{hhsize} + \beta_4 \mathbf{yrsfarm} + \beta_5 \mathbf{annulhhin} + \beta_6\, \mathbf{tobfarm} + \beta_7\, \mathbf{sizarablnd} + \beta_8\, \mathbf{produra} + e$$

Where;

Y = is the dependent variable, which is the food security level.

β_0 = is the constant variable

β_1-----β_8 = is the coefficients of factors affecting food security level.

hhgen = is the gender of the household head

age = is the age of the household head

hhsize = is the size of the household

yrsfarm = is years of farming experience of the household head

annulhhin = is annual income of the household

tobfarm = is the tobacco farming engagement of the household

sizarablnd = is the size of arable land of the household.

produra = is the duration of the food aid received by the household

e = is the stochastic error term which captures all other factors neglected but affecting household food access.

3.6 Summary

This chapter primarily focused on outlining methods employed in the study to assess household food access level. The model to be estimated was specified and measurements of all variables considered in the study were defined and justified. It discussed the nature of the data that will be used in addressing the questions that the researcher is posing and also its sources. The next chapter will provide descriptive statistics of the data used in the study, estimate the linear regression models and interpret the results. It runs the diagnostic tests that have been highlighted in this chapter.

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CHAPTER 4
RESULTS AND DISCUSSION

4.0 Introduction

This chapter describes the empirical findings obtained from the field data and the interpretation of the results. Graphs and tables aid with the interpretation, clarification and explanation of the research findings. Information on the factors affecting household food access in Hurungwe District is discussed. First, the socio-economic characteristics of the sampled household are given. This is then followed by the presentation of the findings to the main research questions.

4.1 Respondents' demographic characteristics

One hundred and three male farmers were interviewed against forty-seven females which translates to 68.7% and 31.3% respectively. The respondents' age ranged from 21 to 66 years. The majority of the farmers were aged 41 and the average age of the sample was 44 years. The average family size in the study area was 5 members per household. The smallest family size had one member and the largest had twelve people. With regards to the farmers' marital status, 0.7% were single, 74.7% were married, 11.3% were divorced and 13.3% widowed. The education records of the respondents were that 21.3% had informal education, 26% had gone through the primary education, 49.3% had reached the secondary school stage and only 3% possessed qualifications at tertiary level. In terms of the occupation of the household head, 80.7% were farmers, 7.3% were house wives, both teachers and shop owners constituted 4% each, 2% of the sample were transport operators, welders, carpenters and engineers were pegged at 0.7% each of them.

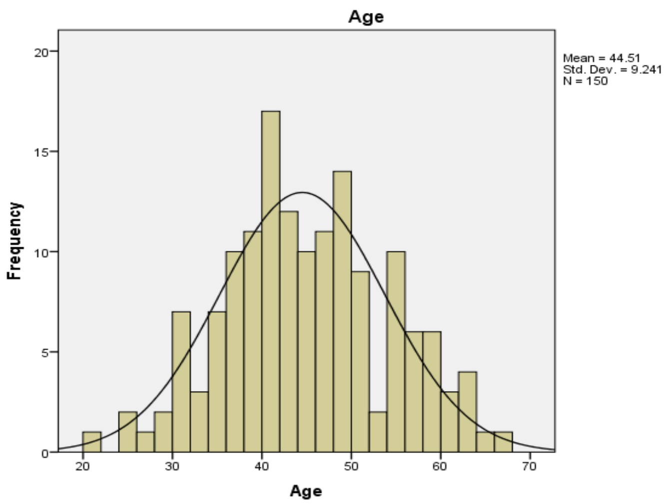
Table 4. Hurungwe farmers' frequency

Name of Farming Area	Frequency	Percent	Valid Percent	Cumulative Percent
Non-Tobacco Grower in Tengwe	25	16.7	16.7	16.7
Tobacco Grower in Tengwe	25	16.7	16.7	33.3
Non-Tobacco Grower in Magunje	26	17.3	17.3	50.7
Tobacco Grower in Magunje	22	14.7	14.7	65.3
Non-Tobacco Grower in Kazangarare	24	16	16	81.3
Tobacco Grower in Kazangarare	28	18.7	18.7	100
Total	150	100	100	

Source: Field data (2020

The data source table shows the breakdown and distribution of the sampled household within Hurungwe district by main three farming areas. Generally and predominantly, Tengwe is comprised of resettled A1 farmers; Kazangarare consists of old resettlements and Magunje is made up of communal lands.

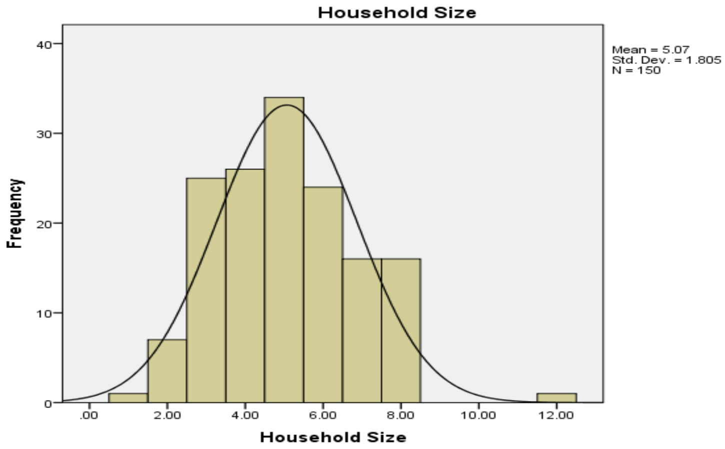
Figure 2. Age of the household head



Source: Field data (2020)

Figure 2 illustrates how the respondent were distributed by age groups, the survey dealt with farmers aged between 20 and 68. However, it is noticeable that the majority of the farmers fall into the 36 -52 years age categories. Within this age range most farmers are aged 42 years

Figure 3. Size of Household



Source: Field data (2020)

The above figure displays how distributed in terms of household size the sample was. It had an outlier which consist of 12 family members. Besides, the majority had between 3 and 6 members averaging 5 which is consistent with the CSO 2012 census results.

4.2 Household food access analysis

To determine the level of household food access in the tobacco growing region of Hurungwe district. The HFIAS score tool was used to show the individual household food access score. The derived HFIAS score was compared against the cut-off point on the food security scale. Which was pegged at thirteen and below (0-13) for the food secure households and thirteen and above (13 - 22) for the food insecure households.

Table 5. Tobacco Farming by HFIAS Score Sheet

Tobacco Farming	N	Minimum	Maximum	Mean	Std Deviation
0 HFIAS Score Valid N (listwise) Non- tobacco farmers	75 75	7.00	22.00	13.7733	3.31489
1 HFIAS Score Tobacco Farmers Valid N (likwise)	75 75	1.00	19.00	11.1600	3.05375

Source: Field data (2020)

The table shows a great significant difference in the HFIAS score between farmers those farmers who engage in tobacco production and non-tobacco farmers.

Table 6. Food Security Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Food Secure	61	40.7	40.7	40.7
	Food Secure	89	59.3	59.3	100.0
	Total	150	100.0	100.0	

Source: Field data (2020)

4.3 Factors affecting household food access level

To determine the factors affecting household food access, the multiple linear regression analysis was used.

4.3.1 Results of the multiple linear regression analysis

The results of the multiple linear regression analysis indicated that the age of the household was statistically significant and positively affect the household food access. The coefficient indicated that, ceteris paribus one more unit increase in age resulted to about 1.945 increase in food access level. However, the gender and the act of being engaged in tobacco farming do affect household food access level such that an increase of 1% to food access level is achieved from a change of 0.655 and 1.945 respectively of these variables.

The size of household, years in farming and the annual household income were not statistically significant in affecting the food access level hence a 1% increase to these variables, result in a decrease in the food access score with -0.140 , -1.124 and -1.397 respectively.

The R-Square value indicated that 72.5% of the variation in food access was explained by independent variables. The adjusted R-Square of 48.9% of the variation in food access was explained by the independent variables.

According to Katundu et al. (2014) citing Wooldridge (2001) advocated that the Variance inflation factor (VIF) and tolerance level are the most common tools used to detect the presence of multicollinearity in a regression model. The presence of two or more independent variables in the regression model that resembles to be highly correlated that is multicollinearity (Katundu et al., 2014). He further emphasised that multicollinearity is a matter of degree and if you measure it using VIF, the average value should not exceeds the value of 10. If the value exceeds 10, it means the model has high degree of collinearity. On average the results of the study show the VIF value of 4.7 which means there is no multicollinearity on four variables only. The tolerance level was also used to complement the VIF value and six values which were less than one were recorded from the variables under consideration.

The Durbin Watson test was used detect the presence of autocorrelation. This test assumes that when D-W value is close to zero, there is greater indication of positive correlation. The D-W value which is closer to four shows a greater indication of negative correlation whilst the D-W value of two simply means there is no autocorrelation. The study research had the D-W value of 1.786 which translates that there is no autocorrelation since it is closer to 2.

Standard form report for multiple linear regression model:

Y = 2.795 + 0.655 *gender* + 1.945 *age* - (0.140) *household size* -1.124 *years farming*

(3.458) (1.656) (0.134) (0.462) (0.172)

-1.397 *Annual HH income* + 0.323 *tobacco farming*

(0.00) (0.000)

**R^2 = 0.725

Table 7. Coefficients of Multiple Linear Regression Analysis

Variables	**Coefficients**	**Standard error**	**Significance**	**Collinearity statistics**	
				Tolerance	**VIF**
(Constant)	2.795	3.458	.027		
Gender	.655	1.656	.533	.496	2.015
Age	1.945	.134	.093	.186	5.368
Household Size	-.140	.462	.892	.233	4.284
Years of Farming	-1.124	.172	.298	.190	5.270
Annual Household Income	-1.397	.000	.205	.047	21.417
Tobacco Farming	.323	.000	.756	.073	13.751
Size of Arable Land	-	-	-	-	-
Programme Duration	-	-	-	-	-
Farm size	-	-	-	-	-
R Square	.725				
Adjusted R Square	.489				
Durbin Watson	1.786				

Source: Field data (2020)

The correlation of the variables was checked from the correlation matrix. It shows the level of movement in tandem of the variables that are included in the model. The level that calls for suspicion in the variables should not be less than 1% tolerance or not more than 10% VIF otherwise it can be accepted.

The researcher continued to analyze food access with the variables that were available since the adjusted R Square was relatively high. The model summary was used and helped to check how well the regression model it fits the data model. An adjusted R Square of 0.645 is significantly high. It shows that 64.5% of the variation in the dependant variable is explained within the model. This measure would support the continuation of the estimation.

The value of *R* (HFIAS score in this case), the multiple correlation coefficient. *R* is considered to be one measure of the quality of the prediction of the dependent variable; in this case with a value of 0.853, indicates a good level of prediction. The R Square (R^2) value (also called the coefficient of determination), which is the proportion of variance in the dependent variable that can be explained by the independent variables (technically, it is the proportion of variation accounted for by the regression model above and beyond the mean model). It can be noted from the value of 0.728 that the independent variables explain 72.8% of the variability of the dependent variable, HFIAS score.

Table 8. Model Summary

Model	**R**	**R Square**	**Adjusted Square**	**Std Error of the Estimate**
1	.853[a]	.728	.645	1.99655

Source: Field data (2020)

a. Predictors (Constant), Programme Duration, Years of Farming, Size of Arable Land, Gender, Annual Household Income, Household Size, Tobacco Farming, Age.

The regression model significantly meet the objectives of fully analysing the variables that influences household food access.

It was observed that of all the variable under test only four were not strongly correlated. These are gender, age, household size and years in farming. The results shows that these variables meet the condition of checking and eliminating for multicollinearity. The conditions are the variable should have a tolerance that is greater than 1(one) but a VIF of less than 10 (ten) at the same time.

Table 9. Tobacco Farming ANOVA

	Sum of Square	**dif**	**Mean Square**	**F**	**Sig**
Between Groups	8.520	18	473	2.140	.008
Within Groups	28.980	131	221		
Total	37.500	149			

Source: Field data (2020)

The results of the test confirms that there is a significant difference in food access level between tobacco growing and non-tobacco producing households when p<0.05.

Table 10. Regression ANOVA

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig**
1 Regression	277.901	8	34.738	8.714	.000
Residual	103.641	26	3.986		
Total	381.543	34			

Source: Field data (2020)

a. Predictors (Constant), Programme Duration, Years of Farming, Size of Arable Land, Gender, Annual Household Income, Household Size, Tobacco Farming, Age.
b. Dependent Variable: HFIAS Score
Coefficients[a]

The *F*-ratio in the **ANOVA** table above tested whether the overall regression model is a good fit for the data. It revealed that the independent variables statistically significantly predict the dependent variable, F (8, 26) = 8.714, p < .0005 (i.e., the regression model is a good fit of the data). These results have shown that the following independent variables (Programme

Duration, Years of Farming, Size of Arable Land, Gender, Annual Household Income, Household Size, Tobacco Farming, Age) significantly influence the household food access level. Since it is known that when p >0.05 the null hypothesis rejected, in this case p < 0.008 we therefore reject the hypothesis i.e. the researcher confirms that a strong positive and significant variation occurs in food access level between tobacco production and non-tobacco farming households.

Table 11. Dependent Variable: HFIAS Score

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig**
	B	**Std Error**	**Beta**		
(Constant)	20.313	4.365		4.654	.000
Gender	2.054	.910	289	2.257	.033
Age	.104	.071	290	1.471	.153
Household Size	-.157	.287	-0.93	-.548	.599
Years of Farming	-.012	.069	-0.29	-1.78	.860
Annual Household Income	.000	.000	-7.87	-3.946	.001
Tobacco Farming	-1.392	1.288	-.207	-1.081	.290
Size of Arable Land	-1.095	.879	-.154	-1.246	.224
Programme Duration	-2.343	.0973	-.343	-2.408	.023

Source: Field data (2020)

Estimated model coefficients specification

This specific model is a linear regression and uses the HFIAS to determine the household status on food in/security. *Y= a* ***(constant)*** *+****bx*** *+* ***cx*** *+* ***dx*** *+* ***ex*** *+* ***fx*** *+* ***gx*** *+* ***hx*** *+* ***ix***

HFIAS = constant+hhgen+age+hhsize+yrsfarm+annulhhin+tobfarm + sizarablnd + produra

HFIAS=constant20.313+hhgen2.054+age.104+hhsize -157+yrsfarm12+annulhhin.000+tobfarm -1.392+ sizarablnd-1.095 + produra-2.343

This is obtained from the Coefficients table, The general form of the equation to predict HFIAS score from age, farming experience, gender of the household head, size of household, annual household income, size of arable land, duration of food aid programme is:-

Y= a (constant) +bx + cx + dx + ex + fx + gx + hx + ix

HFIAS = constant+hhgen+age+hhsize+yrsfarm+annulhhin+tobfarm + sizarablnd + produra

HFIAS = (20.313) + (2.054 x ***hhgen****) + (.104 x* ***age****) - (.157 x* ***hhsize****) - (.012 x* ***yrsfarm****) + (.000 x* ***annulhhin****) – (1.392 x* ***tobfarm****) – (1.095 x* ***sizarablnd****) – (2.343 x* ***produra****)*

Unstandardized coefficients indicate how much the dependent variable varies with an independent variable when all other independent variables are held constant. Consider the effect of age of the household head in this model. The unstandardized coefficient, B_1, for age is equal to 0.104 from the result table. This means that for each one year increase in age, there is an increase in HFIAS score of 0.104.

One can test for the statistical significance of each of the independent variables in this model. This is meant to tests whether the unstandardized (or standardized) coefficients are equal to 0 (zero) in the population. If $p < .05$, one can conclude that the coefficients are statistically significantly different to 0 (zero). The *t*-value and corresponding *p*-value are located in the "t" and "Sig." columns, respectively, as in the result table. However, in this model it can be noticed from the "Sig." column that not all independent variable coefficients are statistically significantly different from 0 (zero). Although the intercept, B_0, is tested for statistical significance, this is rarely an important or interesting finding.

With regards to this research study, a multiple regression was run to predict HFIAS score from age, farming experience, gender of the household head, size of household, annual household income, tobacco farming, size of arable land, duration of food aid programme. These variables statistically significantly predicted HFIAS score, f (8,26) = 8.714, p< .0005,R2 = .728. Not all eight variables added statistically significantly to the prediction, p <.05

4.5 Discussion of the results

The results revealed a wide range of food access scale from the least food secure (22) to the most food insecure (1). The sample mean was 12.4667 which is above the researchers HFIAS cut-off point of 13 points. Most (13) household which translates to (15.3%) had a HFIAS score of 12 points. This shows that the majority of surveyed households were food secure, with 59.3% and only 40.7% insecure. It was noted that 23.3% of households in Hurungwe received food aid, meaning that the responsible authorities had assessed that the other 76.7% were in a better position at the time of the programme. The results of this study indicate that average food access score is above the national average thereby reducing the risk of food insecurity in the area.

Wang and Luo (2005) indicate that household socio-economic characteristics such as ethnicity, education, age, gender, unemployment rate and income are some of the non-spatial factors that could affect accessibility. A food access disparity study by Wang and Dai (2011) revealed that low-income, carless and linguistically isolated families (cultural barrier) in rural areas have a disadvantage in spatial food access. Bashir *et al.* (2012) assessed the food security conditions of rural landless households in twelve districts in the Punjab province in Pakistan by the use of a binary logistic regression analysis. Their study found that the monthly income of households, livestock assets and education level of household heads positively impacted on household food security level.

On the education, it found that household head with education up to middle (8yrs) and intermediate (10-12yrs) school levels were more food secure. However, the age of household head and the increasing household size had inverse relationships with household food security. The authors argue that income appears to be the most important determinant of food accessibility since food security relies heavily on having more access to food and having access to food finally depends on an individual’s purchasing power to command enough food that is needed.

The study revealed that a number of food insecure tobacco farmers would have purchased excess assets which they later on dispose-off at a much lower price than they would have paid for. It was noted also, that a number most of tobacco farmers had cattle as compared to non-tobacco farmers.

a) Gender

The majority (68.7%) of the interviewed households were headed by males. This affects household food access in the smallholder farming of Zimbabwe. As a result, most of the agricultural activities are carried out by women, though decisions on land use and ownership have remained a patriarchal affair (Chitongo, 2017). The results were contrary to the general belief that land reform programmes benefitted males mostly. Indicating a slightly improved land ownership by females through various government empowerment programmes both at local and central levels (addressing equity land redistribution between gender types).

The researcher found a significant positive relationship between the gender of the head of the household and the food security. Male-headed households are more food secure compared to female headed households. Similar results were found by Felker-Kantor and Wood in a study carried out on female-headed households and food insecurity in Brazil. They revealed that the odds of food insecurity are higher among female-headed households compared to male-headed households. In Niger, female-headed households are relatively poorer, and most of them are widows. Gender of the household head plays an important role in determining the livelihood strategies which are going to be adopted by the household. This is as a result of different roles fulfilled by males and women especially in the African culture where some crops are branded male crops such as growing of cash crops and staple foods (Eneyew & Bekele, 2012).

Gender also influence the type and amount of resources available to the household head since most of the livelihood assets and endowments in the African culture are allocated to the male counterparts hence they have an edge over their female counterparts. Gender analysis provides qualitative information on how the gender of the household head influences the livelihood strategies which are pursued by the household.

The small percentage of females in the sample might be attributed by the cultural issues that most of the household properties including land are owned by men. In a study by Kuboja *et al.* (2011) on adoption and impact of tobacco production in Tabora Region also found the percentage of male who owns tobacco farms being more than that of women. Furthermore, the study reports that the initial capital for tobacco production is not easily accessed by many females (Kuboja *et al.,* 2011). Household socio-economic characteristics of the sampled population are analyzed and presented in this section. The study area was characterized by a high proportion of male headed households. This pattern of male domination of household heads position was similar across all the farms within in the study area.

b) **Age**

Mahelet, 2007 confirmed that age of household head is also a factor which influences food security status of the household. This is in agreement with the results from this study. The majority of rural households spend their time on agricultural activities hence the older the household head, the more information and experience he/she farming activities and timing of planting and harvesting. Older household heads tends to be risky averters hence they usually diversify their agricultural activities and consequently usually become food secure than younger headed households. Age is continuous taking the life years of the household head. For ease of administration and limited by the data availability, it is only the age of the head of the household that is used. The age is as reported by the respondent.

c) Farming Experience by the household

The experience of the household head in farming was measured as a continuous variable in the model estimated. It tracked the number of years the household as a whole has been farming, regardless of the household head age or size. These were measured in the number of years as captured by the questionnaire. The experiences are reinforced by the pillars of information in rural areas. These include the extension service providers.

d) **Household size**

Household size is a key determinant of the food security status of the occupants (Hollaway *et al*, 2002). It is because it provides the labour force required to perform different livelihood activities (Takane, 2007). Livelihood activities such as tobacco farming which require more labour force therefore is expected to be positively related to household size and the opposite is true for the relationship between off-farm activities such as hawking. The higher the number of people in the household also implies the more food is required for consumption. However, the higher the number of people in the household also reveal that more labour force will be available for agricultural activities mainly tobacco farming which is a labour intensive crop. Consequently, it is hypothesized that household size and food insecurity are negatively or positively related. The size of the household takes the number of members of the household. It sums up all the people that are members of the same household, taking the children, parents, household head and even the family extension. It takes those considered to be members of the household.

e) Size of arable land

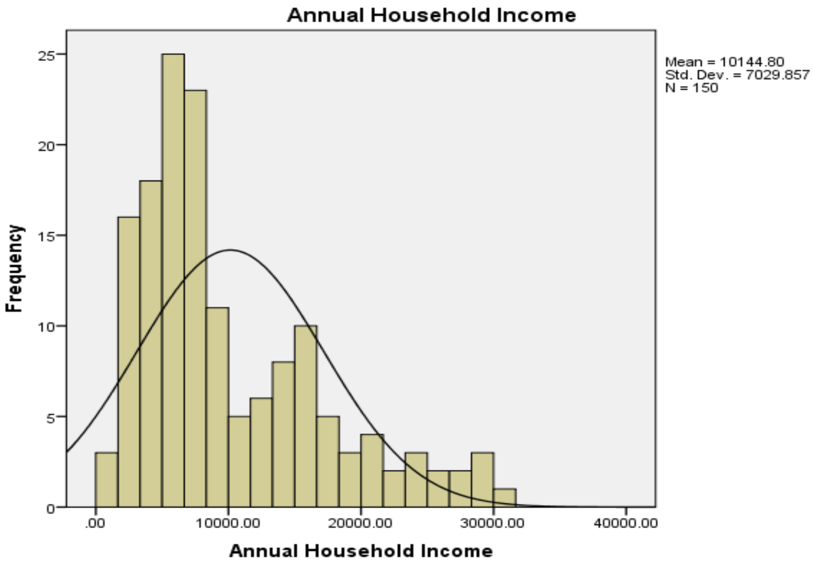
Farm or land size has a higher likelihood of influencing food security status of the household (Bogale and Shimelis, 2009), (Demeke and Haji 2014). When households possess large farm size they have better opportunities of increasing food production as well as other agricultural output such as tobacco through increasing the area of land under cultivation. As a result a household will be in a better position to become food secure since agricultural output obtained can be consumed or sold to obtain income which can be used to purchase a variety of food groups to attain food security. The land tries to cater for the ability of the household to rear livestock and diversified farming. It does not consider the quality of the land. The land also supports the rearing of livestock which for this research was measured by the number of cattle, goats, sheep and poultry owned by the household as a whole.

f) Annual household income

Income is also an important factor in determine food security status of the household since it provides the household head with the ability to acquire inputs and other important livelihood assets (Bashir *et al*, 2012). As a result the household would have better platform of producing enough livelihood outcomes such as food production or cash crop output such as tobacco which could be sold and be used to acquire food thereby enabling the household to become food secure. These are the total incomes that accrue to the household as a whole coming from various enterprises as measured in United States Dollars (usd$). Incomes were arrived at by summing up the crop and livestock sales proceeds, employment, trade and any other income of the household. This is an important and as well as a continuous variable that was used in the model of estimation.

It was noted during the survey that many households failed to purchase the food stuff even though food was available locally. Households confirmed that they lack purchasing power to provide food for their family members. According to a World Bank report, the prevalence of poverty and extreme poverty are relatively higher in rural areas, with 65.7% of the population in rural areas living below the poverty line. The results revealed a negative and significant association between the lack of household income money and food access.

Figure 4. Annual household income



Source: Field data (2020)

The study discovered that annual household income was an important factor that explains food access and were amongst the variables found to be statistically significant in influencing household food access as measured by HFIAS. The reported coefficient of negative 0.0002 is statistically significant at 1 % and implying a positive relationship between access to food and incomes. Marginal effects from the model suggest that an increase in the incomes of the household increases the probability of a household being food and nutrition secure. As the incomes increase for any given household, the access to food improves. This is also accompanied by the reduction in the chances of one being food insecure as measured by HFIAS. Since as HFIAS falls the more food secure a household is it is highly commendable for a negative relationship. This implies that policy makers should emphasize on the improvement of the incomes as this has proved to be a consistent variable in the determination.

There are an estimated 850 000 growers of tobacco in India, with farming characterized by small family farms. Studies on the Tobacco Industry in Andhra Pradesh found that marginal and small tobacco farmers depend on this crop as the main source of their family income and of livelihood, particularly for food which accounted for about 68% of the annual household expenditure.

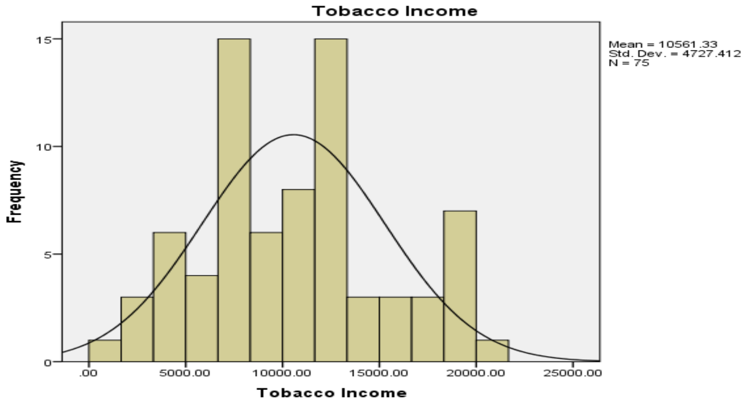
In Brazil, for example, some 135 000 family farmers produce tobacco as their main economic activity. In the 2000/2001 crop year average gross income per family farmer reached R$ 9,165 (US$5,000). Tobacco in Brazil provides higher net returns per hectare than maize or edible beans.

In Malawi tobacco has been, and continues to be, the dominant cash crop in the economy accounting for approximately 63% of the country's total export earnings World Trade Organization (WTO, 2002). The focus of the Malawian government policies shifted in support of the majority smallholder farmers which in turn enabled them to boost their production of tobacco and generally led to increase in income obtained by smallholder farmers and improved their food security status (Jaffee, 2003).

In Mozambique tobacco is one of the major sources of income, uplifting the welfare for more than 129,755 farmers in the central and northern regions of the country. On average, the tobacco sub-sector contributes close to 34% of the total agricultural exports and almost 4% of the total exports of goods and services (Benfica et al., 2004). Overall, tobacco is one of the most important agricultural export crops in Mozambique, accounting for 7.8% of total exports in 2011 (Hu and Lee, 2015).

The government believes that tobacco, as cash crop, enables farmers to increase their purchasing power and raise their household standard of living above poverty level according to Miyata et al. (2009). Jerie and Ndabaningi (2011) reported that tobacco is the most important cash crop and a potential major earner of foreign currency in Zimbabwe.

Figure 5. Annual Income from tobacco sales



Source: Field data (2020)

g) Education

The results from the study of Bashir *et al.*(2012) confirms earlier studies by Idrisa *et al.* (2008) on farming households in North-part of Nigeria who reported that households with low level of education, larger family sizes and low levels of income were mostly affected by food insecurity.

This study shows seventy–five percent of farmers interviewed had gone through primary school and reached secondary education level, this means that these farmers are able to participate in educational farming trainings if well designed to address their current challenges. Kapopo and Assa (2012), reported that level of education is a very important aspect of farming to enable quick technological adaptation that has a great impact on shifting the productivity, enabling planning and determination of profitability of the enterprises.

There is a considerable number of famers 21.3 % who are informally educated. This point out for the need for human capital development in order to enhance sustainability of farming in Hurungwe. Human capital encompasses the education level, knowledge and farming skills which the farmers acquire (Chitongo, 2017).

4.6 Challenges encountered during data collection

The survey was conducted during the global epidemic of COVID 19 (Corona Virus) threat. This period most nations including Zimbabwe was on total lock down with strict restricted human movement except for the essential service providers only. Therefore the main drawback encountered was the stringent COVID 19 lockdown rules which prohibited gathering of people and visiting.

The researcher had to wait for the Government to scale down the restrictions to level two which permitted human movement and limited interaction reinforced with social distance and the mandatory wearing of masks. At first the respondents were sceptical of the researcher coming from the town where the rural folks believe COVID-19 was most prevalent.

The key informants were very instrumental in encouraging the participants to be involved in group discussions. The other problem was the bad state of the roads. Besides these, the participants were welcoming and eager to be heard as they freely shared their views and opinion.

A few household would pretend to be what they are not in order to portray a different picture of the real them. This deliberate deceptive move was common in areas which receive donor aid. Behind their mind they thought that the survey was aimed at determining the beneficiaries of the future food programmes. Some of the participants were elusive to give detailed farm enterprises thinking that the survey was a government land usage audit disguised as research project to assess how the farmers are using their farm lands.

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CHAPTER 5
CONCLUSSION AND RECOMMENDATIONS

5.0 Introduction

The chapter summarizes the whole research study relating tobacco growing and food accessibility, the objectives to the methodology and the research findings. It will further give the policy implications of the research findings with reference to the food access in the tobacco growing region of Zimbabwe. The last section will discuss the areas that need further researches and as well the limitations of this study.

Tobacco production remains vital to the Zimbabwean economy, where tobacco is ranked second among the country's top export crops. The study focused on smallholder tobacco farming in the communal and resettled farming areas of Hurungwe district in Mashonaland West Province.

5.1 Conclusion

The main objective of the research study was to analysis the household food access level in Hurungwe district of Mashonaland West Province of Zimbabwe. The study revealed that tobacco production significantly increases food access level at household and throughout the tobacco growing region.

The following factors were noted to be positively significant in influencing household food access level, age of the household head, annual household income and duration of the food aid programme.

The results indicated that tobacco has become the main source of revenues for tobacco growing households.

The study concluded that tobacco farming has an enormous potential to reduce food insecurity in tobacco growing regions of Zimbabwe. This was reflected in the higher of asset ownership and income among tobacco growing households in all these three farming areas. However, they are non-tobacco farming households which are more food secure than tobacco growers due to proper financial education and discipline.

5.2 Recommendations

The government should establish synergy relationship with NGO`s and private organisations in providing affordable inputs of food crops, irrigations facilities and dam rehabilitation and construction activities.

Stakeholders in the food security sector should design and implement cropping programmes that are tailor made for the locals (suited to the agro-ecological region) and generally encourages the growing and rearing of drought tolerant crops and animals respectively.

The extension service providers in the agricultural sector should incorporate models of records keeping and proper business management in their farmer training programmes and workshops.

The government should come up with policies that support food supplements and increases household incomes will enhance food security.

Generally, the level of education of household heads was quite low in the study area and especially among the female headed households. Hence it is recommended that development efforts should be directed at providing equal access to affordable and quality educational opportunities for both males and females in the study area.

Agricultural production in the form of vegetables has shown to improve household food security. Hence making land accessible could serve as a major incentive for agricultural production increase especially for the vulnerable groups such as the poor and female headed households. Increasing agricultural production will ensure that the households have enough food for consumption or to supplement purchases from the market. Increasing own food production will minimize the heavy dependence on market purchases and also improve household food access.

The study recommends an inclusion of a drought tolerant food crop within the crop rotations in these farming areas, provision of government funded irrigation schemes, of subsidised government food crop inputs at ward level, as well as supply infrastructural development programmes in order to enhance inputs and finished food accessibility and sustainability

5.3 Areas for further research

It is imperative to note that ongoing research in the rural areas on the matter of food security is needed, in order to fully understand the complex dynamics of this issue and to acquire more information on the diverse conditions and the different stakeholders regarding food insecurity in these areas. This would include adopting a more integrated and holistic approach to these problems. More detailed and in-depth knowledge through research will be one of the key tools to combat the ongoing struggle for survival of by smallholder farmers in developing countries.

Further research should be conducted to assess the impact of establishing tobacco processing plants on food access in tobacco growing regions of Zimbabwe. This would be aimed at including and embracing the smallholder farmer in the value addition chain of the tobacco industry. Unprocessed tobacco is worth less than selling semi processed one, therefore in order to increase the farmers' inflow revenues the government should consider establishing and owning or facility the local to partly own tobacco processing companies. This will enable the farmers to benefit from downstream value addition activities. However, the results obtained in this study provide a guideline on the expected food access level in a tobacco growing region of Zimbabwe.

There is also a need to conduct such a study of food access in the sectors which seems to be economically topical, active a vocal such as the artisanal gold miners of Zimbabwe. The linking fact being that these miners are assumed to make a number of numerous big cash-ins during their operations, but are seen to be broke a few days after such a jackpot. They are also several weird reports on how artisanal miners tend to spend their hard earned cash.

5.4 References

Bashir, M.K. (2009). The Determinants of Rural Household Food Security for Landless.
Regassa and Stoecker (2011). The Food Security System, www.researchgate.net › publication
Richardson, C. (2005). Food Security and Access to a Healthy Diet in Low-Income

5.5 Appendices

Appendix 1. Survey Questionnaire

QUESTIONNAIRE ON HOUSEHOLD FOOD SECURITY

Preamble
The information contained herein this questionnaire shall be treated with all the confidentiality it deserves and shall be used for the purposes of this study only. Feel free to answer all the questions as honestly as possible.***May you please tick the appropriate options. **Your cooperation is greatly appreciated.**

Date...…………April 2020…..........Farm name……………….…….................Kazangarare 0

SECTION A. HOUSEHOLD DEMOGRAPHIC INFORMATION							
1. Head of household							
a. Gender	Male				Female		
b. Age in years							
c. Marital status		Married		Single	Divorced	Widowed	
d. Highest level of education of household head							
No formal	Informal education		Primary	Secondary	Tertiary education	Other (specify)	
2. What is your principal occupation?							
3. What is the size of your household? *(in numbers)*							

SECTION B. AGRICULTURE PRODUCTION			
1. How long have you been farming? *(in years)*			
2. What is the size of arable land?*(in ha)*			
3. What agricultural activities do you practice?			
Crop	Livestock	Vegetable production	Fruit production
4. Which crops did you grow last season? (Rank 1 as the most commonly grown)			

SECTION C. TOBACCO PRODUCTION
1. How long have you been growing tobacco? *(in years)*
2. Why did you chose to venture into tobacco farming?
3. Do you hire labour for tobacco operations?
4. Which type of curing fuel do you use during tobacco curing?

5. Last year i) how many hectares did you grew? *(ha)* **ii) What was your total yield?** *(kg/ha)* **iii) How much was your income from tobacco?** *(ZWL)*
6. Do you foresee yourself growing tobacco in the following season? **i) Why?**

SECTION D. HOUSEHOLD FOOD SECURITY			
1. What are your sources of food? (Rank 1 as the most important source of food)			
Own crop production	Food for work	Barter	Food aid
Gifts of food	Wild food collection	Purchase	Steal
Friends/relatives	Own livestock products	Loans	Hunting
Other sources of food (Specify):			
2. On average, how many meals do you have per day?			
3. Do you think you have access to enough food?	Yes	No	
4. How do you rate your level of access to food nowadays as compared to last year?			
No change	Better	Fair	Worse off
5. Did your household benefited from Food aid last year?	Yes	No	

6. Name of the organisation	**Quantity of aid per month**	**Duration of the aid programme** ***(in months)***
Government		
NGO 1.		
NGO 2.		
NGO 3.		
Other specify		

Please note: **Question 7 is about food accessibility in the past 4 weeks (1 month)**	
7. If yes to the following questions, How often did this happen? **0=** Never**; 1** = Rarely (once or twice in the past four weeks); **2** = Sometimes (three to ten times in the past four weeks); **3**= Often (more than ten times in the past four weeks)	
a. Did you worry that your household would not have enough food?	
b. Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	
c. Did you or any household member have to eat a limited variety of foods due to a lack of resources?	
d. Did you or any household member have to eat some foods that you really did not want because of a lack of resources to obtain other types of food?	
e. Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	
f. Did you or any household member have to eat fewer meals in a day because there was not enough food?	

g. Was there ever no food to eat of any kind in your household because of lack of resources to get food?	
h. Did you or any household member go to sleep at night hungry because there was not enough food?	
i. Did you or any household member go a whole day and night without eating anything because there was not enough food?	

8. When do you encounter food shortages?(you may tick more than once)

Any time of the month	Just before month end	Before harvesting	After drought	**Other times:**

9. Do you have any maize or maize meal in storage?
ii) If yes how long do you think it will last?

10. What is causing food shortages in your household?

11. What adjustments or possible solutions have you made to avoid food shortages if any?

12. What type of livestock species do you keep? (Rank specie)

Class	Cattle	Goats	Sheep	Chickens	Pigs	Other (specify)
Number						
Rank						

13. Why do you keep livestock? (Rank 1 as the most important reason)

14. **What are your sources of income?** (Rank 1 as the most important source of income

Source	**Annual income (ZWL)**	**Rank**
Crops		
Vegetables		
Livestock		
Poultry		
Salary/wages		
Pension		
Trade (transport, resale of goods)		
Sale of wild foods		
Other (specify)		

15. How much was the annual household income?

ii) Expenditure	Percentage (%)
Food	
Movable assets	
Non movable assets	
Shelter	
Education	
Other (Specify)	
16. What assets did you purchase last year?	