GREAT ZIMBABWE UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF MANAGEMENT STUDIES

THE INFLUENCE OF BANANA FARMING PRACTICE ON LIVELIHOODS OF FARMING HOUSEHOLDS IN HONDE VALLEY, MUTASA DISTRICT, MANICALAND PROVINCE

BY

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This Research Project is submitted in partial fulfilment of the requirements of the Master of Commerce Degree in Strategic Management at Great Zimbabwe University

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Approval Form

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Dedication

This research project is dedicated to my wife, Alice for the support and prayers during this study period and to my children, Tinovimba and Tanatswa for always checking on me on how I was faring with my studies.

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Abstract

The main aim of this study was to investigate the Influence of Banana Farming Practice on Livelihoods of Farming Households in Honde Valley, Mutasa District, Manicaland Province. There is no transformation of livelihoods in the communities of Honde Valley and this is worrisome as the banana farmers still live in abject poverty and still lack household assets, need assistance in the form of food, seeds, finances, and farm inputs. The study was premised on the main objective of investigating the influence of banana farming practices on the livelihoods of smallholder farming households in Honde valley. Household survey questionnaire, key informant interviews and focus group discussion were used as the main research tools when conducting this study as a qualitative research method. The smallholder banana farmers were the research participants basing on their level of knowledge on banana farming practice and how it influences their livelihoods. The study used a post-positivist research paradigm based cross-sectional descriptive survey research design. Using the saturation principle for the qualitative sample, the Raosoft sample calculator on the internet was used to create samples of 117 and 5 respondents for the quantitative and qualitative approaches, respectively. Since the research employed a mixed methods approach, the probability sampling method, simple random sampling techniques, non-probability method, and convenience sampling approaches were employed. The distribution of 87 self-administered questionnaires resulted in 78 being successfully completed and returned, showing a response rate of 89.7%. Five key informant interviews were also conducted. Descriptive statistics, correlation, and linear regression analysis techniques were used. Thematic analysis was used to analyse qualitative data. The study found that the smallholder farmers were implementing various banana farming practices. The study found out that banana planting material influenced the livelihoods of the smallholder farmers. The study established that soil fertility and water management and livelihoods of smallholder farmers were in a moderate positive relationship. The study established that integrated pest and diseases management and livelihoods of the smallholder farmers were in a strong positive association. The study established also that post-harvest handling techniques and the livelihoods of the smallholder farmers were in a strong positive association. The study results show that value addition and marketing had a significant influence on the livelihoods of the smallholder farmers. Table 5.1 summaries the findings of the hypotheses tests of the study. The study concludes that banana farming practice influences the livelihoods of the smallholder farmers and it was recommended that to improve the livelihoods of the smallholder farmers, banana farming practices have to be

incorporated in the day-to-day running of the farming enterprise. The study also recommends that the farmers focus more on integrated pest and disease management in order to improve banana production productivity.

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CHAPTER 1
INTRODUCTION

1. Introduction

In Honde Valley, Mutasa District of Manicaland Province, bananas are primarily produced by smallholder farmers using poor farming practices. This research focuses on smallholder banana farming practices. Several empirical studies have tried to identify role of banana production in transformation of livelihoods of rural communities. The purpose of this study is to investigate the influence of banana farming practices on livelihoods of smallholder farmers in Honde Valley. This introductory chapter therefore provides a conceptual background of the influence of banana farming practice as the main research construct understudy, in terms of livelihood transformation of smallholder farmers in Honde Valley's livelihoods. The chapter serves to show the research problem and the factors that have triggered this research. Furthermore the chapter describes the objectives guiding this study and the questions to be answered at completion of the research. The chapter also highlights the significance of this research and the practical use that will be made of the findings of the study in the smallholder banana farming sector of Zimbabwe. The scope of the research, its limitations and assumptions as well as how the study is organised in terms of chapters are other aspects of the study that are covered in this introductory chapter.

1.1. Background to the Problem

Banana farming is key to the livelihoods of many communities in different parts of the world with the potential to contribute to food security and incomes at household level (Wahome, et al., 2021). In October 2020 the Government of Zimbabwe launched the Agricultural Systems Transformation Strategy (AFSTS) and the National Horticulture Recovery and Growth Plan which aim at reviving agricultural production in view of climate change. These national development plans stress the importance of investments in sustainable smallholder farming practices in order to ensure food security and reduce poverty in developing economies (Mwalupaso, et al., 2019). The banana value chain is becoming key in small holder agriculture, household consumption and economic development (Tossou, et al., 2011). Despite the food and economic importance of the value chain, the smallholder banana sector still faces some production and marketing challenges (Dassou, et al., 2021).

In Zimbabwe, banana production become very popular in the 1980s soon after attainment of independence and the major banana producing areas are in Manicaland Province particularly in South Eastern Lowveld (Burma Valley [Mutare District], Chipinge [Chipinge District] and Honde Valley [Mutasa District]) with little livelihood transformation (SNV, 2007). To this extent an estimated 7921 hectares are under banana production in Zimbabwe. About 25% of the area is considered to be under commercial farming and 75% under smallholder agriculture According to the 2022 Second Round Crop and Livestock Assessment Report, production levels reached about 300 988 metric tonnes which was a 10% increase from the previous year (MoLFWRD, 2022). In Honde Valley one of the banana producing area, the production levels for small holder farmers are around four (4) metric tonnes per hectare per annum (FAO, 2014). More than 4 000 household in Honde Valley are believed to depend on banana production for more than a third of their income, which is estimated to be less than USD$2 000 per household per year, according to (SNV, 2007). It possible to raise these incomes of smallholder banana farmers by up to 400% through improved banana farming practices and increasing banana quality and quantity (MoLFWRD, 2022).

Banana plants require a tropical climate with high humidity, excellent drainage, and fertile soils. With the above conditions being satisfied, the plants are easy to manage, and this has witnessed banana farming being successful in Honde Valley, Zimbabwe (The Borgen Project, 2018). In Zimbabwe, banana cultivation was targeting reducing poverty in rural areas, enhancing nutrition and food security, raising incomes, and empowering people in rural communities including Honde Valley, however evidence on the ground show most of the households still remain in abject poverty (Mutami, 2015). Banana farming in Honde Valley can open an opportunity for rural smallholder farmers and their families to access credits and bank loans, increase school enrolment and start local small and medium-sized businesses which can transform livelihoods of the communities (Todaro & Smith, 2012).

Smallholder farmers use agricultural practices such as self-propagation of seeds, mixed crop farming, crop rotation, irrigation, use of animal manure, and use of bio-pesticides to control pests (Anibaldi, et al., 2021). Irrigation combined with good soil fertilization was observed to greatly improve yields and making the banana plants more vigorous and disease tolerant (Waseem, et al., 2020). (Muthee, et al., 2019) In studies conducted on banana production practices in Kenya established that poor practices such as using contaminated planting materials, lack of extension advisory services and pests and

diseases negatively impacted on banana production and productivity (Wachira, et al., 2013).

Banana is the world's most widely known and distributed fruit which is viewed as a great contributor to food security and livelihoods in most developing countries. However, many limiting factors affect banana farming, which cut across socio-demographic factors and crop production or management practices (Wahome, et al., 2021). Banana production and international trade is believed to have started in the 1870s with vast tracts of virgin land being cleared to introduce the crop. Banana production was followed by investment and construction of infrastructure that included railway lines, sea ports, hospitals and schools, thereby transforming the economies and livelihoods of the communities (Abbott, 2009). Farmers consider the cultivation of bananas an attractive option since cultivation is done throughout the year, coupled with the existence of lucrative global markets (Raynolds, 2003).

However, recently, banana growers, exporters, suppliers and consumers have raised concern over the sustainability of production, due to the farming practices which include overuse of pesticides which negatively impact human and animal health and the environment (Waseem, et al., 2020). Despite the potential posed by banana farming practices in transforming livelihoods of the smallholder farmers, some challenges still exist from production to marketing affecting farm incomes and the communities remaining in poverty (Dixon, et al., 2001). Hence it is important to understand the influence of banana farming practices on livelihoods of smallholder farmers and give advice to researchers, extension officer, policy makers, non-governmental organisations and the private sector (Okuthe, 2014).

In Vietnam, smallholder farmers were observed to be practicing unsustainable agricultural production techniques which included monoculture, burning of crop residue, poor soil fertility management that resulted in high pest and disease incidences, natural resource degradation and environmental pollution (Van Thanh & Yapwattanaphun, 2015). The study revealed that 65% of the banana households were of low adoption group of sustainable agricultural practices. Studies in Kenya indicated that banana production was limited by factors which included pests and diseases, limited access to quality disease-free planting materials, access to extension services, access to agrochemicals, and limited access to markets (Wahome, et al., 2021). Non-governmental organizations were observed

to play a great role in providing information and extension service on good farming practices to smallholder farmers (Van Thanh & Yapwattanaphun, 2015). A farmer who interacted with non-governmental organization had more chance to get information and training in good agricultural production practices (Tadesse, et al., 2008). In view of the above studies there is a need to also investigate how socio-cultural aspects may hinder adoption of good banana farming practices. The issue of market access, market negotiation, business planning, quality management and post-harvest handling of banana products can also be further studied to identify their influence on smallholder farming practices.

Banana farming practices are the methods and techniques used to grow bananas (Muthee, et al., 2019), which is one of the most popular and widely consumed fruits in the world (FAO, 2022). Bananas are usually grown in tropical and subtropical regions, where they require warm and humid conditions, rich and well-drained soils, and protection from pests and diseases (Abhishek, 2022). Banana farming practices, include but are not limited to, soil fertility management, water management, banana crop production methods, post-harvest handling technologies (harvesting, packaging and transportation) and value addition (FAO, 2017).

Socioeconomic characteristics of farmers which include age, education, farming experience, perception, income, land ownership, farm size, information-seeking behaviour, and extension services are believed to influence banana farming practices (Kainga, 2013). However, some studies do not find socioeconomic characteristics to influence banana farming practices (Okuthe, 2014). This study in Honde Valley aims at investigate the influence of banana farming practice on the livelihoods of the smallholder farmers.

Smallholders' banana production and yields in many Sub-Saharan African (SSA) countries are severely being affected by a variety of biotic and abiotic factors such as soil degradation, access to clean planting material, management of pests and diseases, post-harvest losses, value addition, and market access (Kema & Drenth, 2018). A significant proportion of the rural population of Sub-Saharan Africa (SSA) is food insecure and lives below the poverty datum lime and this can be attributed to poor natural resource management and unsustainable farming practices (Okuthe, 2014). Some food certification bodies in Europe have observed that banana farming practices (especially under organic

farming) promote pests and disease incidences that compromise food safety (Hamadani, et al., 2021). This will in turn impact negatively on trade, farm incomes and livelihoods of farmers of the exporting countries (Bigot, et al., 2020). Training farmers on good banana farming practices, promotion access to agricultural farming technologies, and facilitation of market access and trade will result in transformation of livelihoods (Wanyama, et al., 2016). In addition to the above a conducive policy environment with more robust and better-regulated linkages to markets and trade is needed for the smallholder farmers to realise increased farm incomes through good banana farming practices (Obanga & Mwaura, 2018).

In view of the gaps and knowledge, the purpose of this study is to investigate banana farming practices and how they address the lack of transformation of livelihoods of the smallholder farmers. Banana cultivation has been identified as a meagre industry in Zimbabwe as there are no formal markets and the smallholder farmers experience very low harvest yields, and earn less than US$200 per year (UNDP, 2012). Average yields by the farmers were between 30 to 50 kilograms of bananas per month. Only small-scale farmers produced bananas, which they then sold to middlemen on the side of the road for low prices so they could resell them for much greater prices (The Borgen Project, 2018).

Sustainable agricultural practices which include agro-ecology, integrated pest management (IPM), conservation tillage, intercropping, crop rotation, and use of farmyard manure, are widely appreciated for their role in improving profitability and sustainability of farm operations developing countries (Yang, et al., 2020). The role of sustainable agricultural practices is to reduce the negative effect of agricultural activities on the environment and enhance economic benefits both at farm and national level (Kassie, et al., 2013). In the farming systems of Sub-Saharan Africa (SSA), substantial research and development investments are made in climate-smart agriculture (Lipper, et al., 2018) to reduce risks and increase resilience of smallholders (Cohn, et al., 2017). Safeguarding and enhancing food and nutrition security under changing climates requires adaptation strategies including climate smart agricultural practices that are tailored to agro-ecological diversity and socio-economic contexts for transformation of livelihoods (Vandamme, et al., 2022).

1.2. Justification of the Study

Smallholder farmers in Honde Valley have been practising banana production since time immemorial without meaningful transformation of their livelihoods or standards of living. According to the Food and Agriculture Organisation of the United Nations, good banana farming practices have the potential to address environmental, economic and social sustainability of the communities through production of safe and quality banana and banana products (FAO, 2017). Many private and non-governmental organisations have tried to assist or partner the smallholder farmers to capacitate them in terms of good farming practices and facilitating market access in order to improve the livelihoods of the communities.

Despite these efforts, little or no transformation of standards of living have been experienced by the farmers. In some instances some slight changes were experienced with the support of private companies such as Matanuska and developmental partners such as the Danish International Development Agency (DANIDA) and United States Agency for International Development (USAID). However, as soon as the donor funded programme ended, the smallholder farmers could not maintain the good banana farming practices and lucrative markets that had the potential of improving their farm incomes and standards of living. This research now aims to investigate the influence of banana practices on livelihoods of smallholder farmers in Honde Valley, Mutasa District of Manicaland Province and come with some policy recommendations that will feed into the Government of Zimbabwe's Agricultural Food Systems Transformation Strategy (AFSTS) and the National Horticulture Recovery and Growth Plan (NHRGP).

1.3. Statement of the Problem

Ideally banana production should result in increased farm incomes and improved standards of living of the smallholder farming households. Banana farming has been existence for several years, but what is observed is that there is no transformation of livelihoods in the communities of Honde Valley and this is worrisome. The banana farmers still live in abject poverty and still lack household assets, need assistance in the form of food, seeds, finances, and farm inputs. Despite the region being well known for banana production, there is still lack of transformation of livelihoods of the smallholder farmers. This has resulted in some of the community members abandoning the banana production entirely to seek employment or opportunities in other sectors of the economy or in the cities. To ensure sustainable livelihoods in the horticulture value chains, Zimbabwe

introduced the Agricultural Food Systems Transformation Strategy (AFSTS) and the National Horticulture Recovery and Growth Plan (NHRGP) in October 2022 but no livelihood transformation has been witnessed in the wards in Mutasa District being investigated under this research (FNC, 2022) (MoLFWRD, 2022). Farm-system theory posit that farming practices influence income generation and transformation of livelihoods (Dillon, 1992). What is unknown is the influence of banana farming practice on Honde Valley smallholder farmers' livelihoods. Therefore the purpose of this study is to investigate the influence of banana farming practices on the livelihoods of smallholder farmers in Honde Valley, Zimbabwe

1.4. Research Objectives

1.4.1. Main Research Objective

This research was conducted to accomplish the following objectives:

i. To investigates the influence of banana farming practices on the livelihoods of smallholder farming households in Honde valley.

1.4.2. Sub Research Objectives

The research also intended to address the following sub-research objectives:

i. To identify the effect of banana planting material and where it is sourced on smallholder banana farming in Honde valley.

ii. To examine the influence of soil fertility and water management practices being implemented by the smallholder banana farmers on their livelihoods.

iii. To assess the consequence of integrated pests and disease management practices being implemented by the smallholder farmers in Honde Valley.

iv. To determine the magnitude of post-harvest handling techniques being practiced by the smallholder farmers.

v. To investigate the extent the smallholder farmers in Honde Valley are practising any value addition and marketing of their banana produce.

1.5. Research Questions

To achieve the research objectives stated above the study was conducted to answer the main and specific research questions below

1.5.1. Main Research Question

i. What are the influences of banana farming practices being implemented by the smallholder farmers in Honde Valley?

1.5.2. Sub Research questions

The following were the sub-research questions to be answered:

i. What is the effect of banana planting material being used by the smallholder farmers in Honde valley?

ii. What is the influence of soil fertility and management practices being implemented by the smallholder banana farmers?

iii. What is the consequence of integrated crop pests and diseases management being practiced by the smallholder banana farmers?

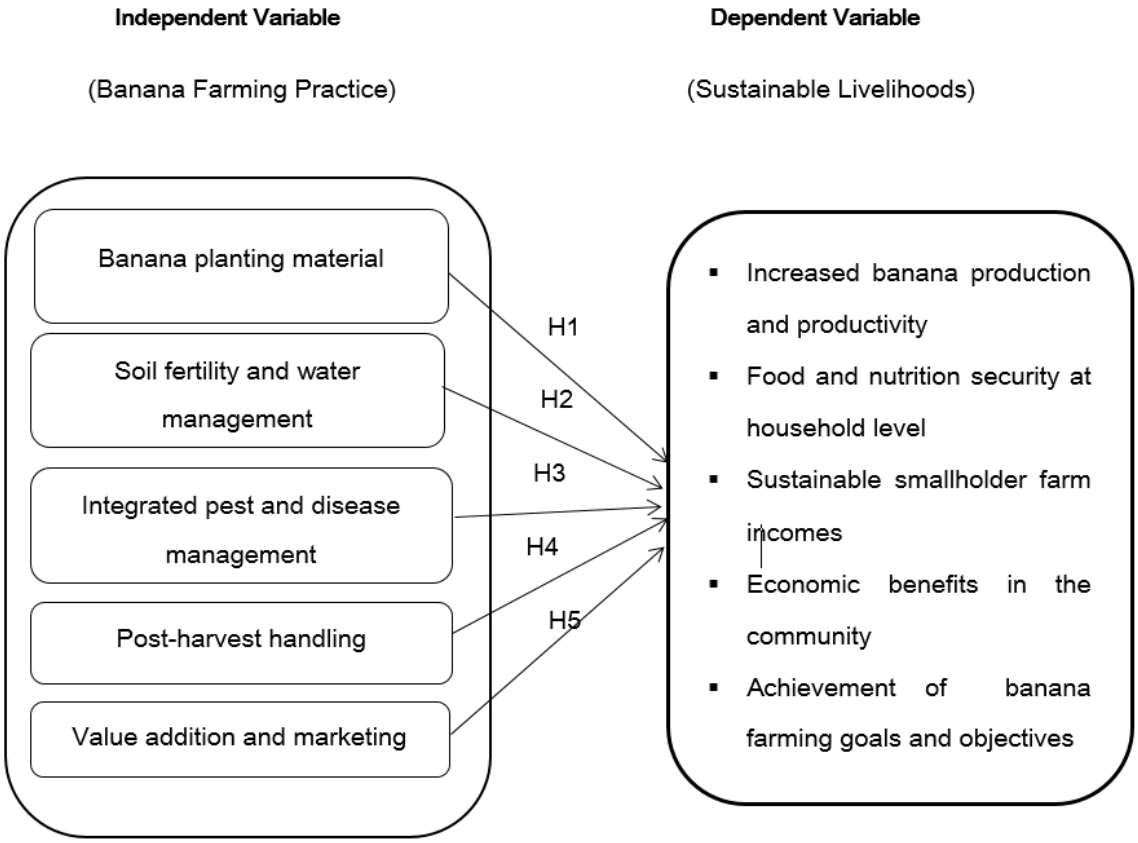
iv. What is the magnitude of post-harvest handling techniques being practiced by the smallholder farmers?

v. What is the extent of value addition and marketing of their banana produce being practised smallholder farmers in Honde Valley?

1.6. Conceptual Framework

Banana farming practices may include soil fertility and water management (Nyombi, 2013), plant health and nutrition, integrated pest and disease management (Wachira, et al., 2013), good agricultural practices including weeding, post-harvest handling technologies, and value addition (Rajput, et al., 2017) and these can influence banana production and productivity (Okuthe, 2014), food and nutrition security, smallholder faming households incomes, sustainable livelihoods and rural development (Chitamba, et al., 2016) and this is illustrated by the table below:

Table1.1: Independent and Dependent Variables



Source: Author (2023)

1.7. Statement of Hypothesis

The research was guided by the main and specific hypothesis which are below that were derived from the above research objectives and questions.

1.7.1. Main Hypothesis

H1: Banana farming practices influences the livelihoods of smallholder farming households in Honde valley.

1.7.2. Specific Hypotheses

H1a: Banana planting material influences livelihoods of the smallholder banana farmers.

H1b: Soil fertility and water management influences livelihoods of smallholder banana farmers.

H1c: Integrated pest and disease management influences livelihoods of smallholder banana farmers.

H1c: Post-harvest handling technologies influences the livelihoods of smallholder banana farmers.

H1d: Value addition and marketing influences the livelihoods of smallholder banana farmers.

1.8. Significance of the Study

This study has enormous theoretical and practical implications to many of the organisations and value chain actors in the agriculture sector. In line with the country's national development strategies that aim at sustainable livelihoods and rural economic development which is agriculture-led. The study's findings and recommendations therefore have the practical advantage of providing a remedy for the low agricultural production and productivity the country is currently experiencing. The government may use the researcher's findings to strengthen their competencies and develop practical solutions to challenges being faced by the agriculture sector, which could ultimately lead to increased performance of the sector. It was anticipated that the study will produce new insights regarding the influence of banana farming practice on the livelihoods of the smallholder farmers in Honde Valley, Mutasa District in Manicaland Province. The new information might help the smallholder farmers increase production and productivity and have sustainable livelihoods. The study therefore has theoretical value and the literature that is already available will be enhanced in terms of knowledge gaps being filled. Through the study, the researcher also benefited from the new information gathered, research techniques, and knowledge generated. Last but not least, if the study is published, the reputation and standing of Great Zimbabwe University will also be enhanced.

1.9. Delimitation (Scope) Of the Study

The scope of a study refers to the domain of research that specifies what is being studied and what is not. The conceptual scope of this research study is on banana farming practices and sustainable livelihoods. The study was on the influence of the influence of banana farming practices and livelihoods of smallholder farming households. The research was conducted in Honde Valley in ward 5, 6, and 7 of Mutasa District. This is the geographical scope of the study. Smallholder farming households out of these Mutasa wards were not included in the physical delimitation part of the research. On the other hand, theoretical scope of the study is included theory of agriculture knowledge and practice (Stone, 2016), which focuses on farmers' agricultural knowledge, practices

(Paladimo & Jansen, 2016). The population scope of the research which included smallholder banana farmers who are the target of the study.

1.10. Limitations of the Study

Every study which is conducted has some limitations which can be viewed as potential shortfalls that are generally beyond the researcher's control and usually linked to the research design, statistical model constraints, financing constraints, geographical locations or other reasons (Theofandis & Fountouki, 2019). In view of this (Theofandis & Fountouki, 2019), point out that a challenges beyond the control of the researcher and they should be clearly stated. As such, one of the major overriding limitation for the research was time and funding constraints. The time dedicated to the research study was less than six (6) months and being self-funded. These limitations meant data collection was restricted as the dissertation had to be submitted within the six (6) months' period for examination. In addition to this, data was also generalized as the as farmers and other key informants interviewed were at the peak of the agricultural production season.

1.11. Assumptions of the Study

According to (Simon & Goes, 2013) assumptions in research are those things which are considered to be true and are not within the control of the researcher that make the research very relevant. The study was conducted based on the following assumptions. It was assumed that banana farming practices and livelihoods of the smallholder farmers are critical in the communities. Additionally, it was believed that the respondents would react honestly and truthfully, when completing the questionnaires and interview guides. The research study's methodology was based on the researcher's premise that the sample size was representative of all of the smallholder banana farmers.

1.12. Organisation of the Research

The research is composed of five chapters. The first chapter is the introductory chapter dealing with the background of the study, the statement of the research problem, objectives and questions, primary to the study. The second chapter the literature review chapter which focuses on literature from previous researchers' study findings on similar topics and problem. The third chapter is known as the research methodology. This covers the philosophy of the study, its design, population, sampling methods, research tools used and data analysis procedures applied to produce results. Chapter four is on results

and discussion. Finally, the last chapter is chapter 5 which deals with findings, conclusion and implications.

1.13. Operational Definitions

The key words in this research are defined as below:

1.13.1. Farming Practice

Farming practices include the type and tools used for tillage, soil fertility management, integrated weed and pest management, protection and promotion of local biodiversity and the origin or source of seeds and seedlings (Pepin, et al., 2021).

1.13.2. Banana Farming Practices

A banana farming practice is an expansive term that encompasses biophysical and socioeconomic aspects, including household characteristics, crop production, animal raising, and resource management, which transforms important production factors (land, labour, and capital) into useful goods (Agajie, et al., 2018).

1.13.3. Smallholder Agriculture

Smallholder agriculture is a type of small-scale farming that entails crop and livestock production on small plots of land with the help of family members and using some of the produce for personal consumption and the surplus for sale (Feyso, et al., 2021).

1.13.4. Sustainable Livelihoods

The abilities, possessions, and pursuits necessary for a means of subsistence are considered a livelihood (Fuchs, et al., 2019). A livelihood is regarded sustainable when it can withstand stresses and shocks, recover from them, and retain or improve its capacities, resources, and activities both now and in the future without compromising the natural resource base (Natarajan, et al., 2022). A sustainable livelihood is a livelihood that can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term (Kashyap, et al., 2022). This implies that a sustainable livelihood is not only about income or material well-being, but also about capabilities, assets, resilience, opportunities, and impacts and not about the present, but also about the future and the wider context (Makate, et al., 2017). A sustainable livelihood

approach is a way of thinking about the objectives, scope, and priorities for development activities and it is based on the idea that people are best placed to decide what they need to achieve their own livelihood goals (Fuchs, et al., 2019).

1.14. Dissertation Outline

This study is composed of five (5) chapters that aim at addressing the five (5) sub-research objectives outlined in section 1.4.2 and answer the five (5) sub-research questions highlighted in section 1.5.2. The second (Chapter 2) looks at the literature review of the study, with the main focus of the chapter being theoretical literature review, conceptual framework, and empirical literature review on banana farming practices and its significance on smallholder farmers across the globe. The third chapter (Chapter 3) describes the research methodologies in view of the target population and sample size and the approach to research (positivism and interpretivist) used to address the objectives and questions stated in the first chapter. The empirical results and findings of the study are presented and discussed in the fourth chapter (Chapter 4) and the last chapter (Chapter 5) summarises the research findings and results, discussions and conclusions derived from the research and policy implications and recommendations.

1.15. Chapter Summary

As a way of summary, this chapter introduced the research by indicating the topic and the research problem. This chapter gave the background of the study by discussing existing research on the influence of banana farming practices on livelihoods of smallholder farmers. This included identifying gaps in studies previously conducted by other scholars on banana farming practices by smallholder farmers at international, regional and national level. The chapter went on to describe the objectives and questions and hypotheses supporting the research study. The importance of the study to the agriculture sector and smallholder banana farmers of country, its value to literature, Great Zimbabwe University and the researcher were also presented. The chapter further described the scope, limitations and assumptions of the study. Finally, the main terms highlighted in the study were defined. The next chapter is the literature review.

CHAPTER 2

LITERATURE REVIEW

2. Introduction

This Chapter reviews current literature on the subject of the study on the influence of banana farming practice on the livelihoods of smallholder farming households Honde

Valley, Mutasa District, Manicaland Province. Literature review identifies the key themes connected to the dependent and independent constructs of the study, highlighting areas of convergence and divergence, gaps identified from our knowledge about the subject of the research area, and directs further research on the subject (Khotari, 2019). This literature review is directed by the objectives, questions and hypotheses of the study. This is followed by a deep dive into smallholder agriculture, banana farming practices, importance of smallholder banana farming, smallholder farming household livelihoods and the influence of banana farming practices. In this chapter, literature on the theoretical framework which build the conceptual framework and hypotheses of the study are also presented.

2.1. Smallholder Banana Farming

Agriculture is essential for economic development as according to (Worldbank, 2023), agriculture contributes about 4% of the world's gross domestic product (GDP) and as much as 25% of GDP in some least developed nations. However, food security, poverty reduction, and agriculture-driven growth are all in jeopardy due to numerous shocks which include the COVID-19-related disruptions, extreme weather, pests, and conflicts (FAO, 2022), that are having a negative impact on agricultural practices, driving up food prices and escalating hunger (Worldbank, 2023).

Agricultural activity is year round job in most parts of the African continent as most smallholder farmers cultivate both annual and perennial crops (Anibaldi, et al., 2021). Smallholder agriculture is a type of small-scale farming that entails crop and livestock production on small plots of land with the help of family members and using some of the produce for personal consumption and the surplus for sale (Feyso, et al., 2021).. The vast majority of farmers in developing nations or in economies in transition, supply a significant portion of the world's food and nutrition needs and sustain the livelihoods of billions of people (Tinsley, 2004).

In Asia, small family farms, sometimes known as smallholders, were thrust into the spotlight by the Green Revolution (Waseem, et al., 2020). Asia is home to about 87% of the world’s smallholder farmers who produce about 80% of the region’s food requirements. In addition to lowering the cost of basic foods, productivity increase in smallholder farms boosts demand for labour in rural regions, creating jobs for the unemployed and rising the wage rate for unskilled labour (Huttunen, 2019). The

smallholder farmers in Asia face quite a number of challenges, chief among them, land fragmentation, soil degradation, water shortages, negative impacts of climate change, limited market access and lack of extension services (FAO, 2015).

A total of 33 million smallholder farms exist in Africa, making up roughly 80% of the continent's farms and providing around 70 percent of the continent's food requirements (Anibaldi, et al., 2021). The main crops grown by smallholder farmers in Africa include maize, sorghum, millets, cassava, yam, plantains, and bananas, as well as cash crops like cocoa, cotton, and tobacco (Feyso, et al., 2021). In Africa, smallholder farmers face difficulties such as low production and productivity, inadequate infrastructure, restricted access to affordable inputs and loans, pest and disease outbreaks, and climate change effects (Cohn, et al., 2017). In Southern Africa smallholder farmers are usually defined as non-productive, backward, non-commercial, subsistence agriculture that is located in marginal areas (Kirsten & Van Zyl, 1998). Smallholder farmers are defined as farmers that derive benefits from subsistence agriculture and this include the group of farmers that produce mainly to generate an income as well as those who produce for their own consumption, but excluded those who earn wages from farm work (Aliber, et al., 2010).

There are over 16 million smallholder farms in Latin America, which together make up about 20% of the total number of farms on the continent and provide about 40% of the food needed (Anibaldi, et al., 2021). In Latin America, smallholder agriculture is primarily based on the production of maize, but it also includes the growing of other crops which include sugar beans, potatoes, quinoa, fruits, and cash crops such as coffee and sugarcane. Insecurities surrounding land tenure, volatile markets, competition from large agribusinesses, environmental degradation, the effects of climate change, and social exclusion are just some of the difficulties being faced by smallholder farmers (Worldbank, 2023).

If properly supported and enabled, smallholder agriculture has the potential to reduce poverty, improve food security, livelihoods, and support environmental sustainability in the communities (Dassou, et al., 2021). In many rural areas, smallholder agriculture plays a significant role in transformation of livelihoods, fostering social cohesiveness and cultural diversity hence governments, development partners, and the private sector are paying more attention and allocating more resources to smallholder agriculture (Cohn, et al., 2017).

Smallholder banana production saw a resurgence in some areas throughout the second half of the 20th Century due to a variety of factors, including land reforms, political shifts, market diversification, consumer tastes, and environmental concerns (Jenkins, 2000). New farming practices which included organic certification, fair trade labelling, and regional integration plans were adopted by some of the smallholder farmers (Fairtrade, 2020). Additionally, the smallholder farmers embraced novel banana cultivars like Cavendish and FHIA hybrids (Coleman, 2020). Nevertheless, the smallholder farmers are confronted by a number of difficulties that included unstable land tenure, low productivity, and restricted access to affordable resources and markets, the negative effects of climate change, pest and disease outbreaks, and competition from large-scale producers (Feyso, et al., 2021).

Smallholder banana farmers who depend on cultivating bananas for their livelihoods, are currently facing challenges that include increased production costs but stagnant pricing, as well as the severe effects of changing weather patterns that make production uncertain and unsustainable (FAO, 2022). The success of smallholder banana production and productivity and transformation of livelihoods are determined by the different biophysical conditions of the farming areas (Chamberlin & Schmidt, 2011). Smallholder agricultural production and the banana farming practices in Zimbabwe are mainly characterized and influenced by the rain-fed and seasonality of agriculture under the different agro-ecological conditions and zones (Feyso, et al., 2021). Smallholder agriculture in Sub-Saharan Africa in general and in Zimbabwe in particular is affected by quite a number of challenges that include limited funding, poor infrastructure, limited extension services and marketing information, and high cost of inputs, among others (Kirsten & Sartorius, 2002).

2.2. Importance of Smallholder Banana Farming

Banana farming practice plays a crucial role in implementing sustainable land use management techniques to enhance water use efficiency, soil fertility, and pest and disease control (Bigot, et al., 2020). Utilizing compost residue, legume species, human urine, and organic farm waste are some of the soil and water management techniques employed by smallholder farmers in addition to intercropping bananas with other plants like maize, beans, coffee or other crops (Dessart, et al., 2019).

Banana farming practice has the potential to conserve soil fertility, water resources and wildlife habitats through the implementation of crop rotation, planting cover crops, use of organic fertilizers and water saving techniques (Dassou, et al., 2021). Fertile soils with good drainage are necessary for banana plant growth (Anibaldi, et al., 2021). To replace the nutrients lost during harvesting or production, farmers may use organic or inorganic fertilizers (FAO, 2017). Banana production serves as a primary source of mulch for supplying and maintaining soil fertility and reduces soil erosion on steep slopes in East and Central Africa (Mbaka, et al., 2008). Banana farming practice can also provide employment and income for millions of people in tropical regions, especially the smallholder farmers and workers on plantations (Fairtrade, 2020).

Bananas are the most exported fresh fruit in the world ($10 billion annually) and it is crucial source of income for rural households in developing nations (FAO, 2022). Bananas are the primary source of food and income for about 20 million people in East and Central Africa (Mbaka, et al., 2008). Banana production generates the vital foreign currency earnings that governments depend on to improve health, education, infrastructure and other social services (Fairtrade, 2020). The importance of banana production on the livelihoods of smallholder farmers depend on good agricultural practices and availability of input and the benefits include food and nutrition security and environmental sustainability (Obanga & Mwaura, 2018). Millions of small farmers worldwide, particularly in developing nations, rely on banana production as a major source of income (Abhishek, 2022). It is estimated that about 135 countries practice banana production and the activity is a major source of income and livelihoods for the smallholder farmers (IICA, 2021). Some populations who are more vulnerable consume up to 25% of their daily calories from bananas (FAO, 2022).

Through utilizing organic farm waste, human urine, legume species, and compost residue, smallholder banana production can optimize nutrient cycles and increase soil fertility and water conservation (Okuthe, 2014). These techniques can also boost yields and decrease the requirement for outside crop inputs (Reetsch, et al., 2021). To yield fruits of the highest quality, banana plants require adequate and consistent irrigation (Abbott, 2009). Depending on the cost and availability of water, banana farmers may choose to utilize different irrigation techniques, such as drip, sprinkler, or furrow irrigation (Bigot, et al., 2020). Farmers must also keep an eye on the soil and crop water conditions and plan irrigation accordingly (Anibaldi, et al., 2021). To conserve water resources, the banana farmers can also use recycling and water-saving techniques (FAO, 2017).

By cultivating many banana types and intercropping them with other crops like coffee, beans, or maize, smallholder banana production can improve biodiversity and resilience (Anibaldi, et al., 2021). Intercropping as also been observed to reduce the incidences of pests and diseases on banana crops resulting in increased farm incomes and revenue (FAO, 2022).

2.3. Banana Farming Practices

Farming practices include the type and tools used for tillage, soil fertility and water management, integrated weed and pest management, protection and promotion of local biodiversity and the origin or source of seeds and seedlings (Pepin, et al., 2021). Farming practices has the main aim for maintaining biodiversity, water, soil and landscapes in the presence of climate change, post-harvest handling techniques and value addition (Cohn, et al., 2017). The sustainable practices include conservation tillage, crop rotation, reduction of fertilisers, pesticides and fungicides usage, rotational grazing and landscape preservation (Dessart, et al., 2019). The most commonly used sustainable farming practice in crop farming is minimum tillage or soil disturbance, use of permanent soil cover, crop rotation, mixed crop farming, improved seed varieties that are drought and heat tolerant, water and soil conservation, and ecological pest control (Anibaldi, et al., 2021).

A banana farming practice is an expansive term that encompasses biophysical and socioeconomic aspects, including household characteristics, crop production, animal raising, and resource management (Chitamba, et al., 2016), which transforms important production factors (land, labour, and capital) into useful products – post harvest handling and value addition (Agajie, et al., 2018). Banana farming practice also considers socioeconomic factors like gender roles, food security, and cost-effectiveness in addition to biophysical elements like soil nutrients and water balance. (Dixon, et al., 2001).

Banana farming practices are also described as the techniques of growing bananas along with other different crops, animals or enterprises to optimize the use of resources and maximize the benefits (Feyso, et al., 2021). The common banana farming systems include the banana-coffee-based farming system, banana-based composting system, and banana-based integrated farming system (Chitamba, et al., 2016). Banana-coffee-based farming system is a typical smallholder, rain-fed, agroforestry-based subsistence farming method usually practiced in a tropical, and hilly climatic conditions (Anibaldi, et al., 2021).

Along with a few annual crops and native trees, the two main perennial crops grown here are coffee and bananas. This method is believed to promote biodiversity, promote soil healthy, increase food security, and diversify sources of income (Dixon, et al., 2001).

The banana-based composting technique creates compost from leftover bananas and other organic materials, which can increase crop productivity and soil fertility (Anibaldi, et al., 2021). Banana pseudo-stems, leaves, peels, and other trash are gathered from the farm or local markets and combined with microbes, animal dung, and crop leftovers (Muthee, et al., 2019). The compost can be used as a source of nutrients and organic matter to feed banana plants and other crops (Agrifarming, 2017).

The banana-based integrated farming system combines the production of bananas with complementary intercrops and farm enterprises like poultry, dairy, mushroom, and fishing (Reetsch, et al., 2021). The system seeks to boost the farmers' food and nutritional security and incomes by making optimal use of the resources at hand and lowering the likelihood of crop failure (Okuthe, 2014). Additionally the banana-based integrated farming, also improves soil health, water conservation and lowers pest and disease incidences (Kashyap, et al., 2022).

Banana farming practice is the term used to describe the methods and techniques used by banana growers to produce and market their crops and these can vary depending on the location, climate, soil type, cultivar, and market demand of the bananas (Feyso, et al., 2021). The role of banana production practice is to ensure the quality and quantity of bananas for different purposes, such as food, income, trade and nutrition (FAO, 2016). Banana farming practice aims at producing bananas in a sustainable, efficient and safe way and this possess various benefits for the environment, the economy and the society at large (Dassou, et al., 2021). Banana production practice can involve choosing the best banana cultivars for diverse markets and climates as there are more than 1000 different varieties of bananas are grown and eaten around the world (Muthee, et al., 2019). However, the Cavendish variety, makes up around 47% of total output of banana production and is the most commercialized variety (Fairtrade, 2020). A popular and significant staple meal in many countries, plantains are a cooking banana variety that is among the other types (FAO, 2022).

Good agricultural practices (GAP) has been cited as crucial for the sustainability, quality, and safety of banana production, and these include crop production, pest and disease management, soil and water management, and post-harvest handling technologies (FAO, 2017). In addition to the above, the good agricultural practices have been reported lessen the negative effects of banana farming practices on the environment and health hazards (FAO, 2022).

2.3.1. Smallholder Banana Farming Practices

Most banana smallholder banana farmers have access to irrigation water from year round flowing rivers where the water is siphoned using pipes and flows to the fields by gravitation (Chitamba, et al., 2016). In some cases the water from these rivers is diverted into different smaller canals leading to the fields by dams made of plant material or mud and some has well-developed canals made from cement and mud (Feyso, et al., 2021). The agrochemical-intensive production and falling producer prices have created several environmental and social problems for the smallholder farmers involved in banana production (FAO, 2016).

The direct sale of bananas to consumers, traders, cooperatives, or exporters is an option for banana growers (Abbott, 2009). The fruits' quality, size, variety, season, supply, and demand can all affect the price of bananas (FAO, 2022). Low prices, a lack of market intelligence, inadequate infrastructure, and unfair trade practices are just a few difficulties that banana producers may encounter (Fairtrade, 2020). Challenges abound for smallholder farmers who depend on cultivating bananas for a living, including increased production costs but stagnant pricing, as well as the severe effects of changing weather patterns that make production uncertain and unsustainable (FAO, 2022).

Although the trade in bananas is a vital component of the economies of many nations, the social issues in the sector are numerous and intricate as evidenced extremely difficult circumstances for workers are frequently highlighted in reports about issues in the banana industry (FAO, 2022). These issues include low wages, precarious employment, limitations on the right to form groups, and the handling of harmful and environmentally hazardous chemicals without adequate personal protective equipment, to name just a few (Fairtrade, 2020). The agrochemical-intensive production and falling producer prices have created several environmental and social problems for the smallholder farmers involved in banana production (FAO, 2016). The banana farming sector is targeting to meet the growing

global demand of bananas as the crop is classified under the most produced, traded and consumed in the world (FAO, 2016).

Smallholder banana contract farming has been identified to have the potential to address some of the production and productivity barriers and provide an institutional response to the issues of finance and information market failure (FAO, 2015). However, challenges may still exist with regard to the power imbalance between the smallholder banana farmers and businesses, agreement violations, a lack of contract enforcement, and social segregation (Konig, et al., 2013).

Smallholder banana farming is influenced by demand and market competition (Kirsten & Sartorius, 2002) and challenges such as limited access to loans, farm inputs, equipment, excellent road infrastructure, extension services, and market knowledge (Kainga, 2013). Banana smallholder farmers are confronted with a number of issues which include a lack of finance, high input costs, inadequate infrastructure, pest and disease outbreaks, low prices, and marketing challenges (Ogbonna, et al., 2016). Emerging pests and diseases like the Banana Fusarium Wilt (*Foc TR4*), are also effecting smallholder banana export industry and the smallholder banana farming business in general, even in countries where the disease is not yet prevalent (Bigot, et al., 2020). These emerging pests and diseases are already having an effect on production costs as most of the smallholder banana farmers have to investment on biosecurity (Dassou, et al., 2021). The smallholder farmers require strategies to deal with Banana Fusarium Wilt (Foc TR4) and stop the disease's spread (Solis, 2020).

The smallholder farmers are also adopting sustainable banana production methods such as reducing the use of agrochemicals, improving soil and water management will lessen the negative effects of banana production on the environment and society, and this will ensure the health and safety of the smallholder farmers and workers, and adhering to quality and safety standards (FAO, 2022). The agrochemical-intensive production and falling producer prices have created several environmental and social problems for the smallholder farmers involved in banana production (FAO, 2016). Increasing pest and disease resistance through breeding superior varieties is one of the opportunities in that currently that is pursued in the smallholder banana production (Chitamba, et al., 2016).The Consultative Group for International Agricultural Research (CGIAR) Research Program on Roots, Tubers, and Bananas (RTB) is attempting to create new hybrids that combine the

production and quality of cultivated bananas with the resistance of wild banana varieties. This is believed to increase smallholder banana production yields and profitability (CGIAR, 2021).

The smallholder banana farming sector of Zimbabwe has been experiencing low production and productivity in recent years, as the sector performance has been severely affected by lack of agricultural inputs, lack of affordable finance, high input costs, poor infrastructure, severe weather patterns and emerging pest and disease outbreaks (Chitamba, et al., 2016). The smallholder banana farming sector has not been spared by the climate change phenomenon that is characterised by extreme weather conditions such flash floods, droughts, heat waves, long mid-season dry spells and pest and disease outbreaks which have further exacerbate low productivity and negatively impacted on agriculture production (Mutami, 2015). In order to address these challenges bedevilling the smallholder banana farming sector of Zimbabwe, the government, private sector and development partners are implementing various interventions that are aiming at increasing smallholder banana production and productivity (SNV, 2008). The smallholder banana farming interventions include climate-smart agriculture, value chain development, financial inclusion, and policy support of smallholder farmers' profitability, resilience and livelihood transformation (IFAD, 2021).

2.4. Smallholder Livelihoods

In Zimbabwe, about 70 percent of population derive their livelihood from agriculture and about 30% of the formal labour force is found in the agriculture sector (ZIMSTAT, 2022). Around 40 percent of agricultural products are exported while 60 percent are raw materials for the manufacturing sector (Zimstat, 2017). Zimbabwe's economic growth is underpinned by the smallholder agriculture-led development (Todaro & Smith, 2012).

Banana production generates the vital foreign currency earnings that governments depend on to improve health, education, infrastructure and other social services (Fairtrade, 2020) which can positively impact on the livelihoods of smallholder farmers (FAO, 2015). If properly supported and enabled, smallholder banana farming has the potential to reduce poverty, improve food security, livelihoods, and support environmental sustainability in the communities (Dassou, et al., 2021). In many rural areas, smallholder banana farming plays a significant role in transformation of livelihoods, fostering social cohesiveness and cultural diversity hence governments, development

partners, and the private sector are paying more attention and allocating more resources to smallholder banana production (Cohn, et al., 2017).

Smallholder banana practice saw a resurgence in some areas throughout the second half of the 20th Century due to a variety of factors, including land reforms, political shifts, market diversification, consumer tastes, and environmental concerns (Jenkins, 2000). New banana farming practices which included organic certification, fair trade labelling, and regional integration plans were adopted by some of the smallholder farmers (Fairtrade, 2020). Additionally, the smallholder farmers embraced novel banana cultivars like Cavendish and FHIA hybrids (Coleman, 2020). Nevertheless, the smallholder farmers are confronted by a number of difficulties that included unstable land tenure, low productivity, and restricted access to affordable resources and markets, the negative effects of climate change, pest and disease outbreaks, and competition from large-scale producers (Feyso, et al., 2021).

2.4.1. Measuring Smallholder Banana Farmers' Livelihoods

The sustainable livelihoods approach framework is used for examining and planning development interventions with the goal of improving the sustainability of people's livelihoods (Serrat, 2017). Instead of concentrating on the needs and issues of individuals, the sustainable livelihoods approach framework emphasizes the strengths and opportunities that smallholder farmers livelihoods are influenced by various factors, such as access to land, water, inputs, credit, markets, information, and extension services, as well as exposure to risks, shocks, and stresses (Feyso, et al., 2021). Moreover, their livelihoods have implications for their food security, nutrition, health, income, well-being, and environment (Serrat, 2017).Additionally, it acknowledges the complexity and diversity of livelihoods as well as how institutions and policies shape people's decisions and outcomes (Chitamba, et al., 2016). The sustainable livelihoods approach can assist in determining the best strategies for assisting individuals in reaching their own livelihood objectives (Serrat, 2017).

There is no single or universally accepted definition or indicator of smallholder banana farmers' livelihoods (Feyso, et al., 2021). Different studies may use different methods and criteria to measure and compare the livelihoods of different groups of farmers (Reetsch, et al., 2021). However, some of the common elements that are often considered in measuring smallholder banana farmers' livelihoods are farm assets, activities and

outcomes such as health and nutrition status (FAO, 2022). One possible way to measure smallholder banana farmers' livelihoods is to use a combination of quantitative and qualitative methods that capture the diversity and dynamics of their livelihood systems (Dixon, et al., 2001). By using a mixed-methods approach that combines quantitative and qualitative methods, it is possible to obtain a more comprehensive and nuanced understanding of smallholder banana farmers' livelihoods that can inform policy and practice interventions (Feyso, et al., 2021)

Agricultural production has been at the centre of rural development, and agricultural modernisation was seen as the key to transformation of rural livelihoods, driven by the need to provide food and incomes (Shucksmith, 2012). The importance of agriculture in rural transformation is reflected in the development of farming practices (Huttunen, 2019). To a larger extent the process of livelihood transformation involves moving the smallholder banana farming households from subsistence production to producing for the organised lucrative markets (Mpandeli & Maponya, 2014). Banana farming practice also considers socioeconomic factors like gender roles, food security, and cost-effectiveness in addition to biophysical elements like soil nutrients and water management (Dixon, et al., 2001).

Livelihoods and rural development can also be addressed using the farming practice theory (Stone, 2016), which implies that by focusing on farmers' agricultural practices, and on the diverse materials it is possible to identify how transformation occurs following the introduction of a technology, or its adoption and modification (Huttunen, 2019).

2.4.2. Influence of Smallholder Farming Practice on Livelihoods

Smallholder farming practice can influence livelihoods through various channels, such as income, food security, employment, and resilience (Barrett, 2008). Contract farming, a pre-harvest agreement between farmers and buyers, can facilitate smallholder market participation, improve household welfare, and promote rural development in some countries (Meemken & Bellemare, 2019) though the effects are not uniform and depend on the contract design, crop characteristics, and institutional environment. The smallholder farming practice can also be influenced by various factors, such as agronomy, supply chain, and the enabling environment (Cohn, et al., 2017). Several challenges faced by smallholder producers, include low yields, poor quality, limited access to inputs and finance, and environmental and social issues (Feyso, et al., 2021). Some private sector

efforts to address these challenges and improve smallholder livelihoods include technical assistance, certification, advocacy, innovation, and partnerships and inclusive business models (Chamberlin & Schmidt, 2011). Smallholder farming practice can have significant implications for global food security, poverty reduction, and environmental sustainability (Kassie, et al., 2013). Smallholder farms produce 80% of the world's food supply and are key to achieving the United Nations' Sustainable Development Goals (FAO, 2022).

Farmers' livelihoods that were assessed in Western Kenya by computing total harvest values and examining the overall increase in income brought about by the adoption of climate-smart agricultural techniques taking into consideration households' socioeconomic data were taken into account, the results showed that the adoption and effectiveness of sound farming techniques positive impacted livelihoods (Fuchs, et al., 2019). Agricultural funding, operating land size, horticultural farming, animal ownership, title deed ownership, hours worked, and crop species and yields were other noteworthy positive characteristics that influenced livelihoods. In order to improve productivity and food security, climate-smart agriculture (Lipper, et al., 2018) has also been suggested as a potential option for positive livelihood outcomes (Fuchs, et al., 2019). Additionally, climate-smart agriculture had the potential to achieve climate goals, which would increase the sustainability of local communities' livelihoods (Lipper, et al., 2018).

A study to examine the impact of livelihood assets, risk perception, and shocks on smallholder coffee farmers' decisions to engage in unconventional agricultural methods was carried in San Martn, Peru (Jezeer, et al., 2019). Depending on their resources for sustaining their livelihood and the potential for diverse environmental and economic results, smallholder farmers would use various agricultural practices to deal with a variety of shocks and stresses (De Beenhouwer, et al., 2013). There has been an increasing threat to conventional farming practices due to climate change, however this issue might be handled if the livelihood assets that influence decision-making are modifiable (Jezeer, et al., 2019).

2.4.3. Influence Traditional Farming Practice on Livelihoods

Traditional farming practice can influence livelihoods through various channels, such as income, food security, employment, resilience, and health basing on the indigenous knowledge and experience developed over the centuries and have remained popular even now (Singh & Singh, 2017). The farming systems now involve the application of natural

resources, organic fertilizers, and cultural beliefs of the farmers and help in improving soil fertility, carbon sequestration, resource utilization, biodiversity maintenance, sustainability, and environment protection (Hamadani, et al., 2021). Traditional farming practice can also be influenced by various factors, such as climate change, population growth, natural resource degradation, and market access though being used by half of the world's farming population (De Beenhouwer, et al., 2013). The traditional farming practice faces many challenges such as low productivity, high labour demand, land fragmentation, and lack of modern inputs and technologies. Some ways to improve traditional farming such as enhancing farmers' knowledge and skills, promoting agroforestry and intercropping systems, and facilitating market linkages and value addition (Hamadani, et al., 2021). Traditional farming practice can have significant implications for global food security, poverty reduction, livelihoods and environmental sustainability through adopting the practice as an alternative method for sustainable food production in changing climate (Singh & Singh, 2017). Besides mitigating climate change, traditional agriculture is also helpful for human health safety, natural resource management, energy conservation and socio-ecological integrity (De Beenhouwer, et al., 2013).

2.4.4. Influence of Modern Farming Practices on Livelihoods

Modern farming practice can influence livelihoods through various channels, such as income, food security, employment, resilience, and health as modern farming involves the use of improved seeds, fertilizers, pesticides, irrigation, mechanization, and market linkages (Brockington, et al., 2018). They can help in increasing productivity, quality, and profitability of agricultural production. However, they also entail some risks and challenges such as high costs, environmental degradation, health hazards, and dependency on external inputs and markets (Snyder, et al., 2020). Modern farming practice can also be influenced by various factors, such as climate change, population growth, natural resource degradation, and market access as modern farming is a response to the growing demand for food and income in rural areas (Makate, et al., 2017). However, modern farming practice faces many challenges such as climate variability and change, land scarcity and degradation, water scarcity and pollution, pest and disease outbreaks, and market volatility and uncertainty (Binswanger-Mkhize & Savastano, 2017). The modern farming practice can be improved through enhancing farmers' knowledge and skills, promoting sustainable agriculture practices, and facilitating market linkages and value addition (Snyder, et al., 2020). Modern farming practice can have significant implications for global food security, poverty reduction, livelihoods and environmental sustainability of rural

communities (Brockington, et al., 2018). Smallholder farmers have responded to the shifts in the wider political-economic context by adopting modern farming methods and increasing their asset ownership have improved their livelihoods and ideas about farming and wealth (Snyder, et al., 2020). However, the smallholder farmers are being cautioned against the negative impacts of modern farming such as land fragmentation, soil erosion, water depletion, and social differentiation (Binswanger-Mkhize & Savastano, 2017).

2.5. Theoretical Framework

Changes in banana farming practice contribute to differently to livelihoods and rural development and this is addressed using the theory of agriculture knowledge and practice (Stone, 2016), which implies that by focusing on farmers' agricultural knowledge, practices (Paladimo & Jansen, 2016), and on the diverse materials it is possible to identify how smallholder livelihood transformation occurs following the introduction of a technology, or adoption and modification of the agricultural knowledge (Huttunen, 2019). Agricultural production has been at the centre of rural development, and agricultural modernisation was seen as the key to transformation of rural livelihoods, driven by the need to provide food and incomes (Shucksmith, 2012). The importance of agriculture in rural transformation is reflected in the development of farming practices (Huttunen, 2019).

In addition to the above, the resource-based view of the firm and the resultant resource-based theory are also crucial frameworks that are to be referred to as part of explaining and predicting the competitive advantage of the banana farming practice and the performance of the smallholder enterprises (Barney, et al., 2011). The resource-based theory relies on two fundamental assumptions about the firm-based resources to explain how they generate sustained competitive advantage and why some firms may persistently outperform others (Kozlenkova, et al., 2014). The firms stated in the resource based theory can be equated to the smallholder banana farming households. First, smallholder farming households possess different bundles of resources, even if they operate within the same sector and environment and this resource heterogeneity assumption implies that some farms, are more qualified in accomplishing certain activities that is, banana production and productivity, because they possess unique set bundle of resources (Peteraf & Barney, 2003). Second, these differences in resources may persist, due to the difficulty of trading resources across farms, referred to as the resource immobility assumption, which allows the benefits from heterogeneous resources to persist over time as well (Barney & Hesterly, 2012). A resource-based logic proposes that if a farm possesses valuable resources that

few other farms have, and if these other farms find it too costly or difficult to imitate these resources, then the farm controlling these resources likely can generate sustainable competitive advantage and profitability (Barney, et al., 2011).

In this research I shall also be using the terms: Sustainable Livelihoods to cover conceptualisation, approach, and method; the Sustainable Livelihoods Approach to refer to the sedimentation of sustainable livelihoods in research, policy and practice; and the Sustainable Livelihoods Framework to refer to the operationalisation of sustainable livelihoods in methodological terms (Natarajan, et al., 2022).

In this research, I shall also be referring to the theory of reasoned action and planned behaviour (Ajzen, 1985) which is the theory used to understand how the smallholder farmers practices can be influenced by their motivations and attitudes which can later impact on their livelihoods. The smallholder farming practices can attributed to aspects such as farm factors, farmer socio-economic characteristics, availability and access to information, and socio-cultural dynamics (Mozzato, et al., 2018).

Among other models to be used in this research is the Theory of Planned Behaviour, (Ajzen, 1991) which seeks to explain human behaviour through behavioural intention based on attitudes, subjective norms, and perceived behavioural control attributes important to understand smallholder farmers' decisions to adopt certain farming practices.

2.6. Conceptual Framework and Hypotheses

The banana farming practice is driven by factors, including socio-environmental setting, socio-cognitive factors, agricultural institutions, policy and regulatory environment. This research shall be using the knowledge, attitude, and practice (KAP) model to investigate the effects of the farmers' knowledge, attitudes, and farming practices on their livelihoods (Liao, et al., 2022). it is hypothesized that the banana farming practice interventions incorporated the smallholder banana farmers in Honde Valley will have a positive impact in the transformation of the livelihoods of the farming households. Due to lack of lack of resources the farmers might end up bad or poor banana farming practices which will negatively impact on production and productivity (Wachira, et al., 2013) resulting in no transformation of livelihoods, the smallholder farmers can end up engaging in off-farm non-farm income generating activities (Muthee, et al., 2019). It is believed that to a larger

extent the process of agricultural transformation in involves moving the smallholder banana farming households from subsistence production to producing for the organised markets (Mpandeli & Maponya, 2014).

2.7. Summary

The main aim of this chapter was to review the literature on the subject being studied which is the influence of banana farming practices on the livelihoods of smallholder farmers. The major aspects of the study which include smallholder agriculture, banana farming practices, smallholder livelihoods, influence of traditional and modern farming practices and the theoretical and conceptual frameworks were evaluated in the literature. The literature review showed that banana farming practice and livelihoods of smallholder farming households have many attributes and components. In this study good agricultural practices and their potential to transform livelihoods have been investigated. This study's theoretical underpinnings and supporting hypotheses have also been reviewed and these include theory of agriculture knowledge and practice, theories of farmer knowledge and food security and the resource-based theory. The study of the literature also looked at earlier empirical studies on banana farming practices and its influence on production and productivity and challenges faced in order to identify what is already known and gaps for further research. A review of studies has showed that some relationship existed between banana farming practices and production capacities of the smallholder households had been examined; however, the relationship between banana farming practices and livelihoods of smallholder farmers in rural Zimbabwe had not been studied. The conceptual framework at illustrating the relationship between the independent and dependent variables. The methodology to study these interrelationships is presented in the next chapter.

CHAPTER 3
METHODOLOGY

3. Introduction

This chapter explains research methodology used in this study. A research methodology of a study explains how the researcher conducted the study in order to gather accurate, legitimate data to address the research objectives, questions and hypotheses (Khotari, 2019). The research methodology describes in detail the methods, strategies and designs that were implemented in the study with a focus to the target population (Kumar, 2019). The research methodology justifies the procedures selected by highlighting the merits and demerits taking into consideration how practically applicable the methods were to the study (Saunders, et al., 2012). Chapter 3 also includes the data the researcher gathered, where the data was gathered from, how it was gathered and how the data was analyzed. The chapter also presents discussions on the research tools used in the data collection and analysis of the influence of banana farming practice on livelihoods of smallholder farming households. The section on data collection methods explains the nature of the data, the tools that were employed and the sampling techniques, including the basis on which the sample was designed and drawn. In addition to the above, the chapter then goes on to discuss the procedures for collecting the data and how the data was cleaned and analysed. The details of the models adopted for study are also presented and the data variables that were considered for each research objective, question and hypothesis were also addressed.

3.1. Philosophy of the Research

The nature of a research, interpretations, views and traditions and expectations about a generational truth or knowledge is what is referred to as a research philosophy (Kumar, 2019). This deals with methods of development of items of knowledge (Bajpai, 2011) and dictates the research plan and methodologies to be followed (Tsung, 2016). The researcher is permitted to choose the strategy that he or she must follow to address the research questions and create knowledge about the issue under is investigation (Kumar, 2019). In research studies, philosophies that can be selected from depend on the nature of the research topic and issues to be investigated and these include interpretivism, positivism, post-positivism, realism and pragmatism. In this study, the researcher followed the post-positivism philosophy.

3.1.1. Post-positivism

Post-positivism refers to a philosophy that originated from criticism and dissatisfaction with the application of positivism in a social science research (Fusch & Ness, 2015). Post-positivism is not similar to positivism. Post-positivism, can be defined as the study of social phenomena, such as the influence of banana farming practices on livelihoods of smallholder farming households, and can be viewed as emerging from the individual or group of ideas, values, beliefs, ethics, and norms of players within a social field rather than as being objective and independent of the researcher (Kothari, 2019). The researcher's position as a data interpreter is fully accepted in post-positivism as opposed to positivism which states that researcher is an objective analysis and is detached from the knowledge creation process. Post-positivists concur that there are various realities, that reality cannot ever be fully known, and that attempts to grasp reality are constrained by the sensory and intellectual capacities of human beings. Hence, knowledge about anything is not absolute but approximated (Flick, 2014). Post-positivism holds that in order to know something a researcher should use multiple methods (Cresswell, 2014). The researcher used post-positivism because understanding banana farming practices on the livelihoods of the smallholder farming households is a subjective social phenomenon and in an attempt to understand the issue being investigate this requires the use of different methods and knowledge about it is not absolute given that the methods used are not perfect and have no limitations.

3.2. Research Strategy

Basically, there are three research strategies, mixed, quantitative, and qualitative (Kothari, 2019). The researcher adopted the mixed methods strategy.

3.2.1. Mixed methods

According to post-positivism research philosophy, researcher studying social phenomena should adopt the mixed methods strategy, which is basically a blend of quantitative and qualitative methods (Kaushik & Walsh, 2019). This was applied because centralised procurement function, project performance and the relationship between these variables are subjective things whose knowledge cannot be understood objectively and generating knowledge about them requires using many methods of data collection and analysis. The mixed methods strategy was inclined towards the quantitative methods and less of qualitative methods. Both quantitative and qualitative data collection and analyses are done independently in the research process. The research then combines comparison,

relation and interpretation of the results. The convergent parallel mixed methods model was adopted because the researcher wanted to triangulate to ensure that the methods complement each other.

3.3. Research Design

A study design is a framework that specifies how participants were selected and how information was acquired and processed (Flick, 2014). It is a framework that outlines participants are chosen, how is gathered and analysed it (Kumar, 2019). By study goal, there are at least three different research designs: exploratory, explanatory, and descriptive. When data is gathered once at a certain period and then analysed to provide findings the design is cross-sectional (Kumar, 2019).

3.3.1. Descriptive Cross-Sectional Research Design

Descriptive cross-sectional research design was used because the researcher wanted to characterize the centralised procurement system and its effect on project performance. The study aimed to describe the relationship between the variables and this is the aim of descriptive study (Kumar, 2019).

3.3.2. Target Population and Sample Size

3.3.2.1. Sampling Techniques

The people, dyads, teams, companies, or other things that one aims to understand and to whom or to whom the research findings may be generalized or transferred make up the population of interest to a researcher, which is the main group that the research is focused on (Casteel & Bridier, 2021). This is called the general population (Asiamah, et al., 2017). The target population however is the narrowly defined, conceptually constrained set of possible participants to which the researcher may have access and which best captures the characteristics of the population of interest (Casteel & Bridier, 2021). While the general population of the study were the employees of the Ministry of Transport and Infrastructural Development, the target population consisted of those employees who were from purchasing departments and those who worked in projects. Researchers should engage the study's research participants in order to prevent having volunteers who do not match the needs of the research and hence inaccurately reflect the target population, the target group must also be exclusive enough (Casteel & Bridier, 2021). These researcher conducted the research interviews by himself because of his work experience and knowledge and information about the study area.

3.4. Sampling Procedure

The study used both non-probability and probability sampling methods because it was guided by post-positivism research philosophy and the mixed methods research strategy. Sampling is defined as the action of selecting a subset from a larger population or sampling frame. Sampling as the action of selecting a subset from a larger population so that one can come up with conclusions (Taherdoost, 2016). Probability sampling and simple random sampling techniques were used in the quantitative methods and non-probability sampling and convenience sampling for the quantitative methods of the research to produce two samples for the collection of quantitative and qualitative data. Probability sampling methods were used because the study involved quantitative testing of research hypothesis to establish relationships between the variables and the stratified random sampling was used because the target population was not homogenous. Since study was also exploratory in nature, non-probability sampling methods was used to produce in-depth understanding of the variables that were studied and convenience sampling was used to come up with the sample of interview participants in order to save time.

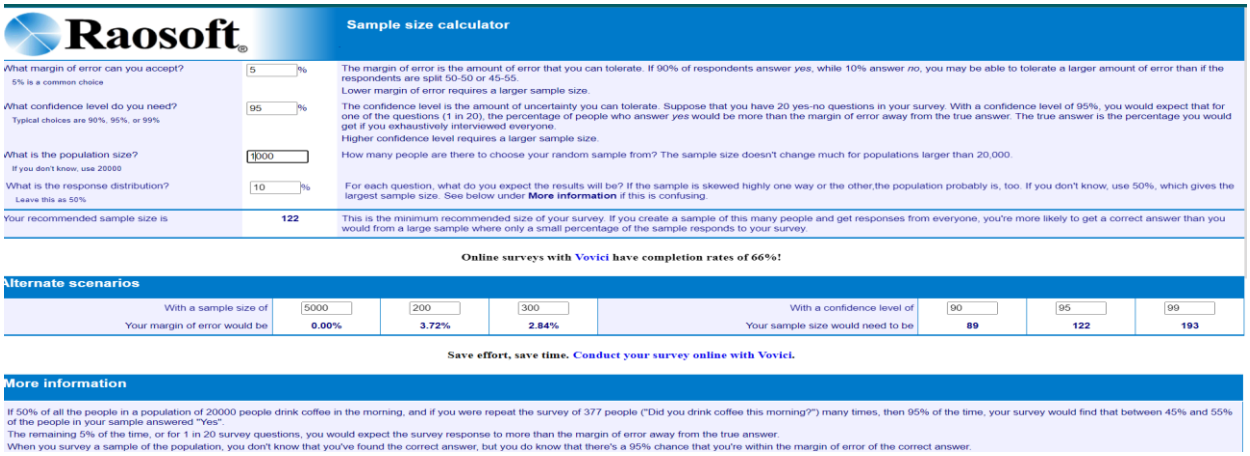
3.4.1. Sample and Sample Size Determination

The research produced two samples in line with the mixed research methods guided by post-positivism philosophy.

3.4.2. Sample for Quantitative Data Collection

Sample size for the sample of the quantitative part of the research was determined using Raosoft sample size determination software available on the internet. Table 3.1 below shows the Raosoft sample size calculator.

Table 3.1 Sample Size Calculation for the Study



Raosoft

Sample size calculator

What margin of error can you accept? (5% is a common choice)	5 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer *yes*, while 10% answer *no*, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? (Typical choices are 90%, 95%, or 99%)	95 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer *yes* would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? (If you don't know, use 20000)	1000	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? (Leave this as 50%)	10 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other,the population probably is, too. If you don't know, use 50%, which gives the largest sample size. See below under **More information** if this is confusing.
Your recommended sample size is	122	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Online surveys with Vovici have completion rates of 66%!

Alternate scenarios

With a sample size of	5000	200	300	With a confidence level of	90	95	99
Your margin of error would be	0.00%	3.72%	2.84%	Your sample size would need to be	89	122	193

Save effort, save time. Conduct your survey online with Vovici.

More information

If 50% of all the people in a population of 20000 people drink coffee in the morning, and if you were repeat the survey of 377 people ("Did you drink coffee this morning?") many times, then 95% of the time, your survey would find that between 45% and 55% of the people in your sample answered "Yes".
The remaining 5% of the time, or for 1 in 20 survey questions, you would expect the survey response to more than the margin of error away from the true answer.
When you survey a sample of the population, you don't know that you've found the correct answer, but you do know that there's a 95% chance that you're within the margin of error of the correct answer.

The sample size for the quantitative methods was 97 respondents drawn from 122 farming households into banana farming practice who collaborated closely with Agricultural and Rural Development Advisory Services (AGRITEX) under the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development.

3.4.3. Sample for Qualitative Data Collection

The sample for the qualitative methods was determined using the principle known as saturation which is brought about as a rule used in qualitative research. In using saturation, the sample size is not predetermined but is determined during the data collection process (Morse, 2015). The researcher using this rule stops adding respondents to the sample when no additional data is obtained and when the researcher sees the same occurrences and information repeatedly (Fusch & Ness, 2015). The sample size was the same as the size interviewees.

3.4.4. Research Instruments

A research instrument is used for collecting data in research (Kumar, 2019) and these include questionnaires, observation checklists and interview guides (Saunders, et al., 2012). In this study, the researcher used a self-administered pre-coded household survey questionnaire for collecting quantitative data, key informant interview and focus group discussion guide for gathering qualitative data. Household survey questionnaires are adaptable, easy to disseminate and administer, efficient and enable uniformity and confidentiality when administering (Saunders, et al., 2012). The household survey questionnaire an affordable and fast method of gathering primary data (Kumar, 2019). An interview guide is a document that summaries interview questions and themes illustrating how each question relate to the research study topic.

3.4.5. Data Collection Procedures

In order to address the research objectives, questions, hypotheses, and evaluate results, data collecting was organized in such a manner of gathering and documenting information on variables of interest (Kumar, 2019). Both qualitative and quantitative data were gathered for the study. The researcher administered the household survey questionnaire and gathered the data in a period of two weeks. Qualitative data was collected using the interview guides during face-to-face interviews and discussions with the key informant and groups of farmers.

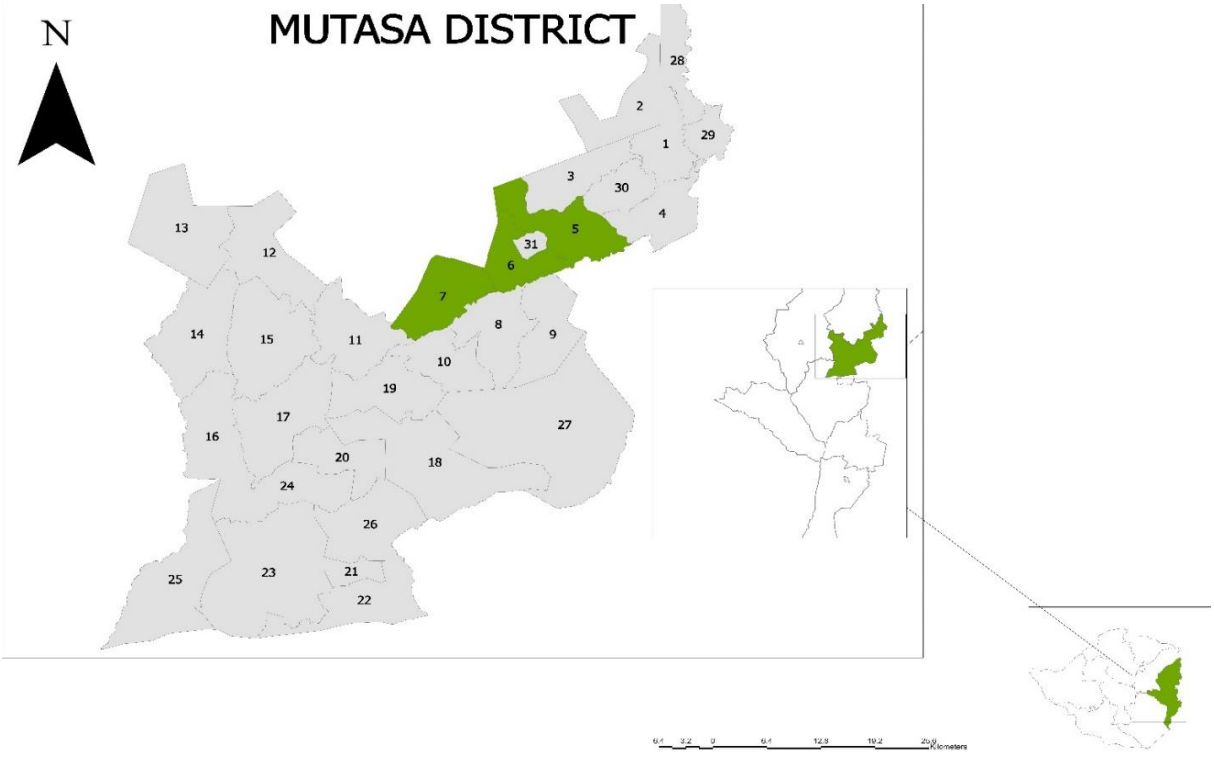
3.4.6. Data Analysis Procedures

Data analysis is about condensing obtained information, creating abstracts, looking for patterns, and applying statistical techniques (Saunders, et al., 2012). Data was analysed using quantitative and qualitative data analysis methods. Descriptive and inferential statistical tools were used for quantitative analysis (Cresswell, 2014). Descriptive statistics make use of frequencies and percentages, means, and standard deviations, while correlational research employ inferential statistical data analysis methods including Spearman and Pearson correlation tests (Cresswell, 2014). Depending on the type of data and its normality, non-parametric statistical data analysis techniques are used when the data is non-normal. To assess normal data, parametric tests were performed.

3.5. Delimitations - Geographical, Data Period, Participant, Theoretical

The scope of a study refers to the domain of research that specifies what is being studied and what is not. The conceptual scope of this research study is on banana farming practices and sustainable livelihoods. The study was on the influence of the influence of banana farming practices and livelihoods of smallholder farming households. The research was conducted in Honde Valley in ward 5, 6, and 7 of Mutasa District.

Map 1: Mutasa District Ward 5, 6, and 7



This is the geographical scope of the study. Smallholder farming households out of these Mutasa wards were not included in the physical delimitation part of the research. On the

other hand, theoretical scope of the study included the theory of agriculture knowledge and practice (Stone, 2016), which focuses on farmers' agricultural knowledge and practices (Paladimo & Jansen, 2016) and on the diverse materials and proved that it is possible to identify how smallholder livelihood transformation occurs following the introduction of a technology, or adoption and modification of the agricultural knowledge (Huttunen, 2019). The population scope of the research included smallholder banana farmers who are the target of the study.

3.6. Reliability and Validity (Cronbach Alpha Value)

Credibility of research instruments and data were ensured and by validity the researcher refers how well the obtained data covers the real field of research and reflects the degree to which a measurement solves what it intends to address (Saunders, et al., 2012). Validity also describes the degree to which a research tool measures what it claims to measure to produce consistent findings, as well as the degree to which the results acquired by a measurement and process can be repeated, is referred to as reliability (Taherdoost, 2016). Validity and reliability were ensured in the study. How well a survey or test evaluates a concept it is intended to examine is referred to as content validity. The validity of tests that measure subject knowledge is frequently evaluated in practice using the concept of content validity. This is the capacity of a tool to measure the characteristics of the construct being studied. Construct validity index was established and an average index of 0.7 or above indicated that questionnaire measured the constructed which were studied (Table 4.4 under chapter 4). Reliability was ensured through calculating the Cronbach alphas of the research constructs and a threshold of 0.7 was used as shown in Table 4.3 under Chapter 4.

3.7. Ethical Considerations

According to research ethics, researchers must respect the rights of their subjects and present their findings in a credible way (Kothari, 2019). Falsification involves manipulating materials, equipment, or processes to change results or omit some data or findings so that the research is not accurately represented or recorded. Fabrication involves creating, inventing, or fabricating data or results before they are recorded or reported (Saunders, et al., 2012). The research maintained honest and integrity that is expected of researchers. The researcher made sure that participants understood why they were taking part in the study and what was expected of them. Included were the study's objectives, methods, potential findings, and any demands, inconveniences, obstacles, or dangers that the

participants might run into as a result of participating in the study. The protection of study participants' privacy, confidentiality and identification was also emphasised.

3.8. Chapter Summary

This chapter details the research approach implemented in this study. The chapter appreciates and explains the quantitative research approach based on positivism as the research's guiding principle. The research design, an explanatory cross-sectional survey design, was also discussed in the chapter. Probability sampling approach employing stratified random sampling and Raosoft sample determination software (Raosoft sample calculator) was used to calculate the sample size. The techniques of data collection, presentation, and analysis, as well as the credibility of the instruments, were all highlighted in the chapter. Ethical issues that must be taken into account while conducting the research study and data collection were also presented in the chapter. The next chapter, chapter 4, captures presentation, data analysis, and discussion of results are the main subtopics.

CHAPTER 4

DATA PRESENTATION, ANALYSIS, AND DISCUSSION OF FINDINGS

4. Introduction

The purpose of this chapter is analysis of data to produce research results and accordingly discuss them making comparison with past research findings. Both quantitative and qualitative analyses were conducted since the study applied mixed method research strategy. For the quantitative data analysis, the chapter covers analysis of demographic data of respondents, reliability and validity tests as well as normality test. The chapter primarily focuses on descriptive analysis of the independent variables of the study which included banana planting material, soil fertility and water management, integrated pest management, post-harvest handling techniques, and value addition and market access on the influence of livelihoods of smallholder farmers. Inferential analysis was used to test the hypotheses using linear regression to establish the influence of banana farming practice on livelihoods of smallholder households. Qualitative analysis used thematic analysis.

4.1. Data presentation

4.1.1. Response Rate

Response rate is determined by dividing the number of respondents with whom interviews are conducted by the total number of respondents in the sample, including non-respondents. Table 4.1 below describes the rate of response that was achieved and used in this study.

Table: 4.1.1.1 Response Rate

	Administered	Returned	Unreturned
Count	97	88	11
Percentage		90.7%	9.3%

Source: Current Survey Data (2023)

Response rate is the degree to which the final data sets contain all sample members. 97 questionnaires were given out in total by the researcher. As indicated in Table 4.1, 88 of the 97 questionnaires were completed and returned, which represents a 90.7% percent return rate. This was an excellent rate of response which could enable generalization of results to be achieved. This response rate holds, since a response rate of 50% is sufficient

for analysis, a rate of 60% is good, and a rate of 70% or above is exceptional (Mugenda & Mugenda, 2013).

4.2. Respondents' Demographic Details

Table 4.2 Participants' Personal Information

Variable		Count	%
Gender	Female	51	57.90
	Male	37	42.10
	Total	**88**	**100**
Age	20-30	13	14.77
	31-40	29	32.95
	41-50	20	22.72
	51-60	11	12.50
	Above 61	15	17.04
	Total	**88**	**100**
Length of time in banana farming	0-5 years	35	39.77
	6-10 years	19	21.59
	11-15 years	23	26.13
	16 years and above	11	12.5
	Total	**88**	**100**
Education	None	29	32.95
	Primary	39	44.31
	O' Level	6	6.81
	A' Level	3	5.68
	Certificate/Diploma	7	7.95
	At least a Degree	2	2.27
	Total	**88**	**100**
Position in the household	Man, head of household	14	15.90
	Woman, head of household	28	31.81
	Man, member of household	15	17.04
	Woman, member of household	19	21.50
	Other	12	13.63
	Total	**88**	**100**
Employment Status	Unemployed	23	26.13
	Full time farmer	16	18.18
	Part time farmer	8	9.09
	Pensioner	19	21.59
	Employed on a salaried job	12	13.63
	Other	10	11.36
	Total	88	100

Source: Primary Data (n = 88)

According to gender, age, education level, and job title, Table 4.2 above details the participants' demographic data. 42.10 percent of the respondents were male, while 57.90 percent of participants were women. This shows that most of the interview respondents were male. In the age range 20-30 there was 14.77% and 32.95% of the respondents was in the age range 31 to 40. 22.70% were in the 41 to 50 age range and 12.50% of participants were aged 51 to 60, while 17.04% were 61 years and above. The participants were therefore mature to take part in the study. Only 11% of participants had had been into banana farming for 16 years and above, while 21.59 % had spent between six and ten years in banana production, and 39.77% had 5 years or less in banana farming. 26.13% of the respondents had been into banana farming for between 11 to 15 years. 32.95% of the respondents reported that they had never received a formal education, while about 44.31% only attained primary education, and this can be attributed to the background of belonging to an apostolic sects, a certificate or diploma was at least held by 7.95% of participants, whereas graduate and postgraduate degrees were held by 2.27% of respondents. Therefore, the majority of the participants lacked formal education and this meant the researcher had to explain the research questions in order to gather accurate information. 31.81% of the respondents were women, head of household, followed by woman, member of household, 21.50%. Man, head of household were 15.90%, while man member of household 17.04% and others were 13.63%. 26.13% of the respondents reported to be unemployed, 18.18% as full time farmers, while 9.09 were practicing part time farming. 21.59% of the respondents were pensioners and 13.63% were employed somewhere on salaried jobs.

4.2.1. Reliability and Validity analysis

4.2.1.1. Reliability Analysis

The reliability tests were done using Cronbach`s alpha which measures the internal consistency of the questionnaire and results are shown on Table 4.3 below.

Table 4.3: Reliability Statistics

Variable construct	Cronbach's Alpha	Number of items
Banana planting material	.832	7
Soil fertility and water management	.824	5
Integrated pest management	.807	5
Post-harvest handling techniques	.815	6
Value addition and market access	.819	6

Source: Current Survey (n = 88)

The Cronbach alpha values should be interpreted according to three rules (Cresswell, 2014). These are: 0.9 outstanding, indicating high instrument dependability; 0.8 good, indicating moderate instrument reliability; and 0.7 good, indicating poor instrument reliability, but still suitable for data collection. Cronbach's alpha values for every study variable in Table 4.3 above were higher than 0.7. The data set reveals that the study items were congruent and constant across all study variables, which gives the collected data credibility.

4.2.1.2. Validity Analysis

By evaluating content validity, an examination of validity was conducted. Regardless of the statistical analytic technique utilized, a survey instrument that is content defective cannot pass the test of construct validity, according to (Fusch & Ness, 2015). A team of lead banana farmers were evaluated to determine the instrument's content validity. The content validity measure is the whole test's mean content validity ratio (CVI). The range of the CVR is -1.0 to 1.0. The closest the CVI is to 1, the greater the test's overall content validity will be. The lower threshold for approving the study questionnaire's content validity was set at a rating of 0.80.

Table 4.4 Analysis of Content Validity

Evaluators	Total Items	Valid Items	Fraction
1	23	20	0.87
2	23	23	1.00
3	23	21	0.91
4	23	22	0.96
5	23	23	1.00
6	23	22	0.96
7	23	23	1.00
CVI	**34**		**0.98**

Source: Current Survey Data

Results of the analysis of content validity are shown in Table 4:4 above. A CVI of 0.98 indicates that the instrument utilized was effective in measuring the researched components when compared to the standard index of 0.80.

4.3. Descriptive and Inferential Statistics

4.3.1. Univariate Analysis of the Variable Using Descriptive Statistics

To explain the researched constructs, the researcher employed descriptive statistics, including the arithmetic mean and standard deviation. The five (5) research constructs underpinning this research were banana planting material, soil fertility and water management, integrated pest management, post-harvest handling techniques, and value addition and market access.

4.3.2. Descriptive Statistics for Banana Planting Material

A descriptive statistical analysis of banana planting material which was one of the independent variable was performed to provide a description of the livelihoods of smallholder farming households. Banana planting material was measured on six (6) measurements. The mean score and standard deviation for each item that were used to measure this variable are presented in Table 4.5. Table 4.5 shows descriptive statistics the mean and standard deviation of the measurement items of banana farming material. The aggregate mean score of company performance is 2.125 and standard deviation of 0.225. The mean score denotes the response and the standard deviation denotes the variability of responses around the mean suggesting whether the respondents had the same or similar view about the measurement items and the variable.

Table 4.5 Descriptive Statistics for Banana Planting Material

Measurement items	Mean score	Mean response	Std. Dev.
Our farm is always implementing good agricultural practices	2.251	Disagree	0.257
Our farm is always implementing climate smart agriculture	2.406	Disagree	0.164
Our farm always attains targeted profit levels	2.382	Disagree	0.175
Our farm always attains targeted production output	2.078	Disagree	0.296
Our farm always achieves its desired results	2.188	Disagree	0.273
Our farm always meets the expectations, interests and needs of its stakeholders and clients	1.443	Disagree	0.187
Aggregate	**2.125**	**Disagree**	**0.225**

Source: Current Survey Data (n = 88)

The aggregate mean score 2.125 means the respondents disagreed that their smallholder farms were always implementing good agricultural practices, climate smart agriculture, attaining targeted profit levels, attaining targeted production output, always achieving its desired results, and meeting the expectations, interests and needs of its stakeholders and clients. The small standard deviation of 0.225 implies that the respondents had the same or similar understanding of the issue under discussion. The analysis reveals that the banana farming households were not achieving their goals and objectives as planned. The participants disagreed that their banana farming households attained targeted sales and profit levels and met their crop production targets. The banana farming households were not achieving desired results and meeting expectations and interest of stakeholders and clients.

4.3.3. Descriptive Statistics for Soil Fertility and Water Management

A descriptive statistical analysis of soil fertility and water management which was one of the independent variable was performed to provide a description of the livelihoods of smallholder farmers in Honde Valley. Soil fertility and water management was measured on four (4) measurements. The mean score and standard deviation for each item that were used to measure this variable are presented in Table 4.6 below.

Table 4.6 Descriptive Statistics for Soil Fertility and Water Management

Measurement item	Mean score	Mean response	Std. Dev.
Our farm has adequate irrigation water and irrigation infrastructure	4.008	Disagree	0.172
Our farm uses little or no chemical fertilisers	4.279	Disagree	0.203
Our farm promotes mulching and cover crops	4.196	Disagree	0.169
Our farm promotes minimum soil disturbance	3.986	Disagree	0.260
Aggregate	**4.103**	**Agree**	**0.230**

Source: Current Survey Data (n = 88)

Descriptive statistics as seen Table 4.6 were computed in order to understand the influence soil fertility and water management on the livelihoods of the smallholder farmers. The measurement items of soil fertility and water management had mean scores above 4 (3.874 – 4.279) with small variability. The aggregate mean score 4.103 denotes the response 'agree' with a standard deviation of 0.230. The small standard deviation

implies that responses given by the respondents were close to the mean score suggesting they were in common agreement. Thus the aggregate mean score implies that the smallholder banana farmers were implementing soil fertility and water management. Given that the overall mean score is agree it means the smallholder banana farmers had the capacity and abilities to implement soil fertility and water management. The study reveals that the smallholder banana farms were to have adequate irrigation water, little use of chemicals, promote mulching and cover crops and minimum soil disturbance to protect the environment.

4.3.4. Descriptive Statistics for Integrated Pest Management

A descriptive statistical analysis of integrated pest management which was one of the independent variable was performed to provide a description of the nature of the livelihoods of the smallholder banana farmers in Honde Valley. Integrated pest management was measured on four (4) measurement items. The mean score and standard deviation for each item that were used to measure this variable are presented in Table 4.7 below.

Table 4.7 Descriptive Statistics for Integrated Pest Management

Measurement item	Mean score	Mean response	Std. Dev.
Our farm is always concerned about environmental management	4.506	Strongly agree	0.316
Our farm advocates for safe use of pesticides	4.423	Agree	0.185
Our farm promotes the use of alternatives to pesticides	4.601	Agree	0.211
Our farm practices crop rotation	4.272	Strongly agree	0.138
Aggregate	**4.096**	**Agree**	**0.225**

Source: Current survey data (n = 88)

Descriptive statistics as seen Table 4.7 were computed in order to understand integrated pest management on the livelihoods of the smallholder farmers. The measurement items of integrated pest management had mean scores around 4 (4.272 – 4.601). The stand deviation indicates small variability in the responses given by the respondents. The aggregate mean score 4.096 denotes the response 'agree' with a standard deviation of 0.225. The small standard deviation implies that responses given by the respondents were close to the mean score suggesting they were in common agreement. Thus the aggregate mean score implies that the farming households were able to implement integrated pest management in order to increase banana production and productivity and improve their livelihoods.

4.3.5. Descriptive Statistics for Post-Harvest Handling Techniques

A descriptive statistical analysis of post-harvest handling techniques which was one of the independent variable was performed to provide a description of the nature of livelihoods of the smallholder farmers. Post-harvest handling techniques was measured on five (5) measurement items. The mean score and standard deviation for each item that were used to measure this variable are presented in Table 4.8 below.

Table 4.8 Descriptive Statistics for Post-Harvest Handling Techniques

Measurement Item	Mean score	Mean response	Std. Dev.
Our farm has post-harvest handling facilities	4.118	Agree	0.272
Our farm implements some post-harvest handling techniques	4.608	Strongly agree	0.364
At our farm crop losses are minimum due to post harvest handling methods	4.070	Agree	0.374
At our farm we always coordinate all its activities to handle production timeously	4.428	Agree	0.273
Our company is always able to deliver banana timeously	4.197	Agree	0.204
Aggregate	**4.284**	**Agree**	**0.290**

Source: Current survey data (n = 88)

Descriptive statistics as seen Table 4.8 were computed in order to understand post-harvest handling techniques influence on livelihoods of smallholder farmers. The measurement items of post-harvest handling techniques had mean scores around 4 denoting agree (4.070 – 4.608). The small standard deviations of the measurement items indicate small variability in the responses given by the respondents. The aggregate mean score 4.284 denotes the response 'agree' with a standard deviation of 0.290. The small aggregate standard deviation implies that responses given by the respondents were close to the mean score suggesting they were in common agreement. Thus the aggregate mean score implies that the post-harvest handling techniques means the smallholder farming households were able to arrange their operations to solve post-harvest loss challenges, execute business operations effectively and efficiently as well as coordinate activities to handle production timeously and deliver goods and services timeously.

Table 4.9 Descriptive Statistics for Value Addition and Marketing

Measurement Item	Mean score	Mean response	Std. Dev.
Our farm household is able to value add and market its banana produce	4.118	Agree	0.272
Our farm household is able to execute business operations effectively	4.608	Strongly agree	0.364
Our farm household is able to execute business operations efficiently	4.070	Agree	0.374
Our farm is always able to coordinate all its activities to handle production, value addition and marketing timeously	4.428	Agree	0.273
Our farm is always able to deliver value added banana produce timeously	4.197	Agree	0.204
Aggregate	**4.114**	**Agree**	**0.209**

Source: Current survey data (n = 88)

Descriptive statistics as seen Table 4.9 were computed in order to understand value addition and market access influence on livelihoods of smallholder farmers. The measurement items of post-harvest handling techniques had mean scores around 4 denoting agree (4.070 – 4.608). The small standard deviations of the measurement items indicate small variability in the responses given by the respondents. The aggregate mean score 4.284 denotes the response 'agree' with a standard deviation of 0.209. The small aggregate standard deviation implies that responses given by the respondents were close to the mean score suggesting they were in common agreement. Thus the aggregate mean score implies that the value addition and marketing by the smallholder farmers means they were able to configure their farming operations to solve challenges, execute business operations effectively and efficiently as well as coordinate activities to handle production timeously and deliver goods and services timeously to the market.

4.4. Normality Test

A normality test was conducted to determine whether the data was normal or not using the Shapiro-Wilk test in order to use the appropriate bivariate analysis tool Spearman's correlation or Pearson's correlation test. Table 4.9 below presents the results.

Table 4.10: Shapiro Wilk Tests

Variable construct	Shapiro Wilk statistic	df	Sig
Banana planting material	0.788	88	0.012
Soil fertility and water management	0.912	88	0.020
Integrated pest and disease management	0.843	88	0.018
Post-harvest handling techniques	0.757	88	0.016
Value addition and market access	0.819	88	0.019

Source: Current Survey Data (n=88)

The Shapiro Wilk test results show that none of the research variables have p-values greater than 0.05. According to Pallant (2005), when significant values are less than 0.05, the data is not normally distributed and non-parametric tests can be applied and the Spearman rank correlation to infer associations between the variables was then used.

4.5. Correlation Analysis

Spearman's correlations were also measured to determine the extent to which the dynamic capability, process capability and operational capability which the independent variables were related to company performance. Table 10 refers

Table 4.11 Correlation Results of the Relationship between the Variables

No.	Variable	1	2	3	4	5
1	Banana planting material	1.000				
2	Soil fertility and water management Significant value	0.512** 0.000	1.000			
3	Integrated pests and disease management Significant value	0.637** 0.000	-	1.000		
4	Post-harvest handling techniques Significant	0.000** 0.000	-	-	1.000	
5	Value addition and market access Significant value	0.000** 0.000	-	-	-	1.000

Source: Current Survey Data (n = 88)

The association between banana farming practice and the livelihoods of the smallholder farmers is shown in Table 4.11. The probability values of all the five banana farming practice

variables are all less than 0.05 implying that all the variables of banana farming practice were associated with the livelihoods of the smallholder farmers. When the probability value of greater than 0.05 it means that there is no association between the variables. The Spearman rank correlation range is from +0.1 to -0.1, with zero signifying that there is no association, -1 denotes a perfect negative relationship and 1 means a perfect positive association between variables. In addition, less than 0.1 signify a very weak association, when correlation coefficient is between 1 and 2 it means there is a weak association while less than 0.3 signifies a moderate and 0.5 to 0.9 means a strong association. The Spearman's rank correlation value of 0.512 between soil fertility and water management and livelihoods of smallholder farmers means that there is a moderate positive relationship between soil fertility and water management and livelihoods of the smallholder farmers. The correlation coefficient value of 0.637 between integrated pest management and the livelihoods of the smallholder farmers means there is a strong positive association between the two variables. The correlation coefficient value between post-harvest handling techniques or value addition and market access and the livelihoods of the smallholder farmers of 0.728 present a strong positive relationship between the two variables.

4.6. Linear Regression Analysis

A linear regression analysis was performed to establish the influence of each independent sub-variable of banana farming practice to test the hypothesized cause-effect relationships. The results of the regression are presented in Table 4.12 below.

Table 4.12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.871[a]	.759	.721	.34813

a. Predictors: (Constant) Banana planting material, Soil fertility and water management, Integrated pests and disease management, Post-harvest handling techniques, Value addition and market access.

The adjusted R square of 0.721 signifies the explanatory power of the regression model which stood at 72.1%. This implies that 72.1% of variability in livelihoods of the smallholder farmers was accounted by the five (5) variable: Banana planting material, Soil fertility and water management, integrated pests and disease management, Post-harvest handling techniques, Value addition and market access. The results indicate that the remainder of 27.9% is explained by other factors outside the model. The influence of Banana planting

material, Soil fertility and water management, integrated pests and disease management, Post-harvest handling techniques, Value addition and market access is presented in Table 4.13 below.

Table 4.13: Regression Results

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.137	.245		.560	.576		
Banana planting material	.021	.048	.074	-1.116	.035	.831	1.204
Soil fertility and water management	.032	.039	.143	.816	.015	.784	1.276
Integrated pests and disease management	.419	.041	.302	10.126	.000	.895	1.117
Post-harvest handling techniques	.367	.045	.126	.930	.000	.856	1.111
Value addition and market access	.296	.043	0.76	.875	.005	.793	1.208

a. Dependent Variable: Livelihoods of the smallholder farmers

The regression analysis above indicates that the independent variables were statistically significant because the sig values are less than 0.05. The results show that banana planting material has a standardized beta coefficient of 0.074 which signifies a very weak association with livelihoods of the smallholder farmers. Any change in banana planting material causes a 0.074 change in livelihoods of the smallholder farmers. As indicated on the Table 4.13 soil fertility and water management with a standardized beta coefficient of (0.143) which implies that a unit increase in soil fertility and water management causes livelihoods of the smallholder farmers to increase by 0.143. Integrated pest and disease management had a standardized beta coefficient value of 0.302 implying that a unit increase in integrated pests and disease management would causes livelihoods of the smallholder farmers to increase by 0.143. The independent variables were found to have a strong influence on livelihoods of the smallholder farmers. The results indicate that the independent variables were independent and not correlated as indicated by the VIFs which were all less than 2. Hence there was no multicollinearity. Table 4.14 provides a summary of the tested hypothesis results is provided on Table 4.14 below.

Table 4.14 Hypothesis Results

Hypothesis	Hypothesized Relationship	P-Value	Remark
H1a	Banana planting material influences livelihoods of smallholder farmers.	.000	Supported
H1b	Soil fertility and water management influences livelihoods of smallholder farmers.	.000	Supported
H1c	Integrated pests and disease management influences livelihoods of smallholder farmers.	.000	Supported
H1d	Post-harvest handling techniques influences livelihoods of smallholder farmers.	.000	Supported
H1e	Value addition and market access influences livelihoods of smallholder farmers.	.000	Supported

Notes: Linear Regression, P-value probability value

The results imply that banana farming practice influences the livelihoods of the smallholder farmers in Honde Valley as the hypothesized by the cause-effect relationships that have been confirmed through regression analysis. The result reveals that banana farming practice contributed positively towards the livelihoods of smallholder farming households.

4.7. Qualitative Analysis

This section deals with qualitative analysis of data because the study used the mixed methods strategy and qualitative methods were relatively less in the study. Five (5) interviewees were conducted and interviews were held at their work places in Mutasa District. Thematic analysis was used and data was presented in word format.

4.8. Issued Raised by Interviewees on Banana Farming Practice

Interviewees revealed that:

…The smallholder banana farmers were operating under tough conditions that were characterized by high cost of inputs including labour costs and the negative effects of climate change (flash floods, cyclones, long midseason dry spells, drought and emerging pests and diseases…. Interviewee 1, 2, 3, 4 & 5 ……. *banana production, productivity and profitability was not pleasing*… Interviewee 1, 2, 3, 4 and 5……

All most all of the smallholder banana farms were not operating at their full potential ……. All interviewees …. Interviewee 1, 3, 5 said ……*banana profits have declined due to the increasing high cost of production under the inflationary environment prevailing in the country resulting in the smallholder farmers failing to meet production targets, sales and profits ……*

Interviewees 3, 4 and 5 revealed that …… *as the smallholder livelihoods are not being transformed some of the households are now engaging in non-farm and some banana plantations are being abandoned ……. This has been worsened by the multicurrency environment the smallholder farmers are operating under – where they purchase crop inputs in USD and sell their banana produce in ZWL* ……Interviewee 1, 3, 4 and 5.

4.9. Discussion and Interpretation of Data

The main purpose of this research was to investigate the influence of banana farming practice on the livelihoods of smallholder banana farmers. The research focussed on five (5) independent variables: banana planting material, soil fertility and water management, integrated pests and disease management, post-harvest handling techniques, value addition and market access, and livelihoods of the smallholder farmers was the dependent variable. The independent variables and descriptive statistical and thematic analyses were carried out in order to understand the research study. The respondents indicated that the livelihoods of the smallholder banana farmers were not being transformed as the farmers were facing some challenges. The analysis revealed that the smallholder banana farmers were not achieving their goals and objectives as planned. The participants interviewed were not in agreement that the smallholder farming households achieved their targeted production, sales and profit levels. The smallholder were not meeting the required production and productivity levels and the expectations and interest of various stakeholders and clients. The same results were found in studies on banana farming practices and productivity (Bigot, et al., 2020), banana farming practices and pests and disease (Chitamba, et al., 2016) and banana production and the environment (Anibaldi, et al., 2021) (Kainga, 2013).

The study found that the soil fertility and water management were very relevant to sustainable livelihoods of the smallholder farmers especially under the effects of climate change, soil health the general shift in conditions of the environment (Dassou, et al., 2021). These findings relate well with studies conducted on banana farming practices in view of climate change global phenomenon (Anibaldi, et al., 2021). The study reveals that smallholder banana farmers need to develop their skills and competencies to handle quickly the changing circumstances affecting agriculture production and productivity (Konig, et al., 2013). Both descriptive and thematic analysis established that the smallholder banana farmers were implementing post-harvest handling techniques and value addition

to reduce production costs, facilitate market access, shorten delivery schedules and speed to market.

The study was conducted to investigate the influence banana farming practices on the livelihoods of the smallholder banana farmers. The Spearman's rank correlation value of 0.512 between soil fertility and water management and livelihoods of the smallholder farmers shows that there is a moderate positive relationship between soil fertility and water management on the livelihoods of the smallholder farmers. The correlation coefficient value of 0.637 between integrated pests and disease management shows that means there is a strong positive association between the two variables. The correlation coefficient value between post-harvest handling techniques and the livelihoods of the smallholder farmers of 0.728 imply a strong positive association between the two variables. The results of the regression analysis reveal that the independent variables were statistically significant because the sig values are less than 0.05. The results show that soil fertility and water management had a standardized beta coefficient of 0.074 which signifies a weak association with livelihoods of the smallholder farmers. Any change in soil fertility and water management causes a 0.074 change in livelihoods of the smallholder farmers. Soil fertility and water management can impact on the livelihoods of the smallholder farmers (Mozzato, et al., 2018). Studies have been undertaken to look at the integration of banana farming practice to enhance income and nutrition security (Kashyap, et al., 2022).

As indicated on the Table 4.13 integrated pests and disease management with a standardized beta coefficient of (0.143) which implies that a unit increase in integrated pests and disease management will result in an increase of 0.143 on livelihoods Previous studies on the influence of integrated pests and disease management on banana production and livelihoods have shown a positive effect (Chitamba, et al., 2016). This study intended to investigate the influence of integrated pests and disease management on the livelihoods of smallholder farmers. Previous studies had not been carried out to identify the role of integrated pests and disease management on livelihoods of smallholder banana farmers.

Results of regression analysis on the influence of post-harvest handling techniques on the livelihoods of smallholder farmers had a beta coefficient value of 0.503 which implied that post-harvest handling techniques influence the livelihoods of the smallholder farmers. The

importance of post-harvest handling has been presented in previous studies with the aim of raising farm incomes (Kema & Drenth, 2018) (Kirsten & Sartorius, 2002). This study intended to investigate the influence of post-harvest handling techniques on the livelihoods of smallholder farmers. This study has found out that banana farming practice: banana planting material, soil fertility and water management, integrated pests and disease management, post-harvest handling techniques and value addition and market access had significant influence on the livelihoods of the smallholder banana farmers.

4.10. Chapter Summary

Data on the research topic of the study on the influence of banana farming practice on the livelihoods of smallholder farmers in Honde Valley have been analysed and presented in this chapter. Both quantitative and qualitative data analysis procedures were implemented in the exploration of the data, however, the analysis was more inclined to quantitative data analysis as highlighted in the research methodology. The statistical studies utilized were descriptive and inferential. The inferential statistical methods utilized were the Spearman's correlation test and linear regression. Thematic analysis was used in qualitative analysis and presentation of data was in the form of tables and texts. The focus of the next chapter (Chapter 5) is the summary, findings, and implications.

CHAPTER 5
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5. Introduction

This chapter presents findings of the research and provides research conclusions and implications of the study. In order to make it easier to draw conclusions and consequences, an overview of the results is given first.

5.1. Summary

The study found that the smallholder farmers were implementing soil fertility and water management through the use of mulching, cover crops and drip irrigation. This was taking into consideration the effects of climate change that was resulting in erratic rainfall, heat waves, long mid-season dry spells and droughts that were affecting banana production and productivity. With integrated pest and disease management the smallholder banana farmers were able to reduce input costs towards procurement of chemicals as the farmers were also using biopesticidal plants, botanicals and implementing weed management. On post-harvest handling techniques the smallholder farmers were cutting the banana fruits in the morning and covering the fruits with leaves and this was noticed to lengthen the shelf life of the banana fruits. With valued addition and market access the smallholder managed to access lucrative markets where they realized higher profit margins. Smallholder farmers who implemented good banana farming practice increased their banana production and productivity through efficient and effective use of inputs coordinated and organised farm activities and access to markets. The study found out that banana farming practice influenced the livelihoods of the smallholder farming households in Honde Valley. The study established that banana planting material and livelihoods of the smallholder farmers were in a moderate positive relationship. The study also established that soil fertility and water management and the livelihoods of the smallholder farmers were in a strong positive association. The study went to establish that integrated pest and disease management and livelihoods of smallholder farmers were in a strong positive association. The study results show that post-harvest handling techniques had a significant influence on the livelihoods of the smallholder farmers. The study also found that value addition and market access had a significant influence on the livelihoods of the smallholder farmers. Table 5.1 summaries the findings of the hypothesis tests of the study.

Table 5.1 Hypothesis Results

Hypothesis	Hypothesized Relationship	P-Value	Beta Coefficients	Remark
H1a	Banana planting material influences livelihoods of smallholder farmers.	.000	.083	Supported
H1b	Soil fertility and water management influences livelihoods of smallholder farmers.	.000	.153	Supported
H1c	Integrated pests and disease management influences livelihoods of smallholder farmers.	.000	.315	Supported
H1d	Post-harvest handling techniques influences livelihoods of smallholder farmers.	.000	.212	Supported
H1e	Value addition and market access influences livelihoods of smallholder farmers.	.000	.107	Supported

Notes: Linear Regression, P-value probability value

5.2. Conclusions

Given the findings of the research makes the following conclusions

5.2.1. The study concludes that banana planting material influences livelihoods of smallholder farmers.

5.2.2. The study concludes that soil fertility and water management influences livelihoods of smallholder farmers.

5.2.3. The study concludes that integrated pests and disease management influences livelihoods of smallholder farmers.

5.2.4. The study concludes that post-harvest handling techniques influences livelihoods of smallholder farmers.

5.2.5. The study concludes that value addition and market access influences livelihoods of smallholder farmers.

5.3. Summary of Conclusions

The study therefore describes some implications of clean banana planting material as a good banana farming practice. Theory of agriculture knowledge and practice (Stone, 2016), implied that by focusing on farmers' agricultural knowledge, practices (Paladimo & Jansen, 2016) and on the diverse materials it is possible to identify how smallholder livelihood transformation occurs following the introduction of a technology, or adoption and modification of the agricultural knowledge (Huttunen, 2019).

5.4. Implications of Clean Banana Planting Material

The study suggests that in order to improve banana production and productivity the smallholder farmers are encouraged to use clean planting material that is disease free. Understanding and having knowledge on the importance of clean planting material will have a positive impact on integrated pests and disease management, post-harvest handling techniques, value addition and market assess. It all begins with clean banana planting material.

The study also recommends the smallholder banana farmers to focus on soil fertility and water management in view of climate change and its negative impacts on banana production and productivity, food security and nutrition, farm incomes, and sustainable livelihoods.

5.5. Implications to Theory

Motivated by the underexplored influence of climate-smart agriculture on smallholder livelihoods, this study examines the influence of banana farming practice on smallholder households. Theoretically, we draw upon the resource-based theory as a crucial framework that can be referred to as part of explaining and predicting the competitive advantage of the banana farming practice and sustainable smallholder livelihoods (Barney, et al., 2011). Next, we theorize that banana farming practice can improve the livelihoods of smallholder farmers.

5.6. Recommendations

The findings from the study provide a foundation for rolling out of sound agricultural extension services to the smallholder farmers and banana-production-dependent households of Honde valley on good banana farming practice that include, but not limited to, clean planting material, soil fertility and water management, integrated pests and disease management, post-harvest handling techniques, and value addition and market access for increased banana production and productivity.

The government of Zimbabwe, through the Ministry responsible for agriculture can support the smallholder farmers with clean planting material, subsidised banana cropping inputs, irrigation facilities or rainwater collection facilities.

Since the role of knowledge of agriculture and farming practices cannot be overemphasised there is need to capacitate both government and private agricultural extension officers with knowledge and skills on the essence of clean planting material, soil fertility and water management, integrated pest management (biological and cultural methods) post-harvest handling technologies, value addition and market access.

5.7. Limitations

As such, one of the major overriding limitation for the research was time and funding constraints. The time dedicated to the research study was less than six (6) months and being self-funded. These limitations meant data collection was restricted as the dissertation had to be submitted within the six (6) months' period for examination. In addition to this, data was also generalized as the as farmers and other key informants interviewed were at the peak of the agricultural production season.

5.8. Areas of Further Studies

The study recommends that the study be extended to other crop being produced by smallholder farmers and explore other factors influencing sustainable livelihoods.

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Appendices

Appendix 1: Household Survey Questionnaire

Study Title: The Influence of Banana Farming Practice on Livelihoods of Farming Households in Honde Valley, Mutasa District, Manicaland Province

Principal Investigator: Mr. Kumbirai Blessing M Nyamwena

Phone number: 0772827125

HOUSEHOLD SURVEY QUESTIONNAIRE

Introduction

Greetings!

My name is Kumbirai Blessing M Nyamwena and I am a Master of Commerce in Strategic Management Student at the Great Zimbabwe University carrying out a study on the influence of banana practices on livelihoods of smallholder farmers in Honde Valley, Mutasa District of Manicaland Province. The primary objective of the study to investigate the influence of banana farming practice on the livelihoods of smallholder farming households. This study is carried out in banana producing wards of Honde Valley in Mutasa District. You have been randomly selected to participate in this study because you are a banana farmer who resides in the selected area of the study. The data that I am collecting will be used by various stakeholders and partners including the Great Zimbabwe University and the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development in coming up with policy recommendations on banana farming practice that influences sustainable livelihoods. Results of this study will help the government, policy makers, researchers, extension officer and farmers to develop and promote best banana farming practice in Zimbabwe and the region. Your name will not be published anywhere.

Screening: We are doing a study on banana farming practice. Are you into banana farming? 1[Yes] 2[no]. If not a banana farmer end the interview and thank the respondent. If a banana farmer, do you consent to participate in this study? 1[yes] 2[no]. If 2 stop the interview and thank the respondent. If 1 proceed to the interview.

Consent Form

What you should know about this study:

- I will give you this consent form to read the purpose, risks, benefits and other relevant information about this study.

- The main purpose of this study is to solicit information regarding farming especially knowledge, attitudes and practices regarding the banana farming.
- I do not promise that this study will help you as an individual.
- You have a right to refuse to take part in this study or to withdraw anytime during the interview.
- You decision to withdraw from the study will not affect your relationship with Great Zimbabwe University and any other agricultural related entity or organisation.
- Scrutinize this form. Ask any questions on issues which are not clear to you before you make a decision of whether or not to participate in this study.
- Participation in this study is entirely your decision.

Purpose

This study is being conducted in partial fulfillment of the Great Zimbabwe University, Master of Commerce in Strategic Management Degree.

The study meets recognized standards for research with human participants. If you take part in this study, you will be asked a series of open-ended questions on your background, knowledge, perceptions and practices regarding agriculture specifically banana farming practice and its influence on livelihoods of smallholder farming households. This research aims to investigate the influence of banana practices on livelihoods of smallholder farmers in Honde Valley, Mutasa District of Manicaland Province and come with some policy recommendations. You have been randomly selected to participate in this study because you are a smallholder banana farmer. A total of 122 study participants will take part in this study in this area.

Procedures and Duration

If you decide to participate, you will be asked to share personal information regarding your background, knowledge, perceptions and practices regarding agriculture specifically banana farming practice. Data will be collected using the face-to-face interview. One-on-one interviews were selected in order to provide privacy and confidentiality to you. These interviews will take between 30 minutes and 1 hour.

Risks and Discomforts

Potential risks to subjects are minimal. However, you may be inconvenienced when the survey is administered at an inconvenient time or place or simply takes too long to administer. You may also face financial risk due to working time lost while completing the interview.

Benefits and/or Compensation

There is unlikely to be any direct benefit to you as an individual. However, the information gathered in this study will help Great Zimbabwe University to better design interventions around banana farming practice that influences the livelihoods of smallholder farmers.

Confidentiality

If you indicate your willingness to participate in this study by signing this document. Results of this study will help inform various stakeholders, private sector, development partners, other horticulture value chain actors, researchers, policy makers, extension officers and farmers on the best banana farming practices that have the great influence on smallholder farming livelihoods. As your interviewer (as the one I shall interact with you during the study) I was carefully trained in human subjects' protection, especially the importance of protecting privacy and confidentiality. In future, we may need to re-contact you to collect additional information. For this reason, limited personal identifying information will be collected.

If You Have Questions: If you have questions about the study, please contact Dr. S. Murebwa on cell: +263778283359

Voluntary Participation

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect your future relations with Great Zimbabwe University and its personnel. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty.

Offer To Answer Questions

Before you verbally agree to participate, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think over it.

Authorization

You are making a decision whether or not to participate in this study. Your signature indicates that you have read and understood the information provided above, have had all your questions answered, and have decided to participate.

_____ _____

Name of Research Participant (please print) Date

_____ _____ AM

Signature of Participant Time PM

_____ _____

Signature of Witness *(if any)* Signature of Interviewer Obtaining Consent

(*Optional*)

You Will Be Given A Copy Of This Consent Form To Keep.

If you have any questions concerning this study or consent form beyond those answered by the investigator, including questions about the research, your rights as a research subject or research-related injuries; or if you feel that you have been treated unfairly and would like to talk to someone other than a member of the research team, please feel free to contact Dr. S. Murebwa (Lecturer, Great Zimbabwe University) on cell +263778283359 or the following address: Great Zimbabwe University, P.O Box 1235, Masvingo

SECTION A: Respondent's Personal Details

1. Indicate your gender

a) Male	1
b) Female	2

2. Marital Status of respondent

Single	1
Married	2
Divorced	3
Widowed	4

3. Indicate your age group

Under 30	1
30 - 40	2
41 - 50	3
51 - 60	4
61 years and above	5

3. Indicate your position in the household?

Man, head of household	1
Woman, head of household	2
Man, member of household	3
Woman, member of household	4
Other	5

5. Indicate your highest qualification

Secondary Education	1
Certificate/ Diploma	2
Bachelor's Degree	3
Master's Degree	4
PhD	5

6. Indicate your employment status

Unemployed	1
Full time farmer	2
Part time farmer	3
Pensioner	4
Employed on a salaried job	5
Other	6

7. How long have you been practicing banana production?

0 - 5years	1
6 - 10 years	2
11- 15 years	3
16 - 20 years	4
21 and over	5

8. Indicate your household's main source of income

Livestock sales	1
Crop sales	2
Salary	3
Own business	4
Pensioner	5
Remittances	6
Other	7

SECTION B: Banana Farming Practices

9. Indicate the extent to which you agree or disagree with the following statements that best describe the banana farming practices being implemented by your farm on a scale of 1 to 5, 1 being 'Strongly Disagree' and 5 being 'Strongly Agree". (Key: 1 'Strongly Disagree' 2 'Disagree' 3 'Neither Agree nor Disagree' 4 'Agree' 5 'Strongly Agree')

Codes	Statement	1	2	3	4	5
BFP1	Our farm is always implementing good agricultural practices					
BFP2	Our farm is always implementing climate smart agriculture					
BFP3	Our company always attains targeted profit levels					
BFP4	Our company always attains targeted production output					
BFP5	Our company always achieves its desired results					
BFP6	Our company always meets the expectations, interests and needs of its stakeholders					

SECTION C: Soil Fertility and Water Management

11. Indicate the extent to which you agree or disagree with the following statements that best describe soil fertility and water management at your farm on a scale of 1 to 5, 1 being 'Strongly Disagree' and 5 being 'Strongly Agree". **(Key: 1 'Strongly Disagree' 2 'Disagree' 3 'Neither Agree nor Disagree' 4 'Agree' 5 'Strongly Agree')**

Codes	Statement	1	2	3	4	5
SFM10	Our farm has adequate irrigation water and irrigation infrastructure					
SFM11	Our farm uses little or no chemical fertilisers					
SFM12	Our farm promotes mulching and cover crops					
SFM13	Our farm promotes minimum soil disturbance					

SECTION D: Integrated Pest Management

12. Kindly Indicate the extent to which you agree or disagree with the following statements that best describe integrated pest management at your farm on a scale of 1 to 5, 1 being 'Strongly Disagree' and 5 being 'Strongly Agree". **(Key: 1 'Strongly Disagree' 2 'Disagree' 3 'Neither Agree nor Disagree' 4 'Agree' 5 'Strongly Agree')**

Codes	Statement	1	2	3	4	5
IPM14	Our farm is always concerned about environmental management					
IPM 15	Our farm advocates for safe use of pesticides					
IPM 16	Our farm promotes the use of alternatives to pesticides					
IPM 17	Our farm practices crop rotation					

SECTION E: Post Harvest Handling Techniques

13. Kindly Indicate the extent to which you agree or disagree with the following statements that best describe postharvest handling techniques at your farm on a scale of 1 to 5, 1

being 'Strongly Disagree' and 5 being 'Strongly Agree". **(Key: 1 'Strongly Disagree' 2 'Disagree' 3 'Neither Agree nor Disagree' 4 'Agree' 5 'Strongly Agree')**

Codes	Statement	1	2	3	4	5
PHH18	Our farm has post-harvest handling facilities					
PHH 19	Our farm implements some post-harvest handling techniques					
PHH 20	At our farm crop losses are minimum due to post harvest handling methods					
PHH 21	At our farm we always coordinate all its activities to handle production timeously					
PHH 22	Our company is always able to deliver banana timeously					

SECTION F: Value Addition and Marketing

14. Kindly Indicate the extent to which you agree or disagree with the following statements that best describe value addition and marketing of bananas at your farm on a scale of 1 to 5, 1 being 'Strongly Disagree' and 5 being 'Strongly Agree". **(Key: 1 'Strongly Disagree' 2 'Disagree' 3 'Neither Agree nor Disagree' 4 'Agree' 5 'Strongly Agree')**

Codes	Statement	1	2	3	4	5
VAM23	Our farm household is able to value add and market its banana produce					
VAM 24	Our farm household is able to execute business operations effectively					
VAM 25	Our farm household is able to execute business operations efficiently					
VAM 26	Our farm is always able to coordinate all its activities to handle production, value addition and marketing timeously					
VAM 27	Our farm is always able to deliver value added banana produce timeously					

SECTION G: Smallholder Farming Livelihoods

15. Indicate the extent to which you agree or disagree with the following statements that best describe performance of your farming household on a scale of 1 to 5, 1 being 'Strongly Disagree' and 5 being 'Strongly Agree". **(Key: 1 'Strongly Disagree' 2 'Disagree' 3 'Neither Agree nor Disagree' 4 'Agree' 5 'Strongly Agree')**

Codes	Statement	1	2	3	4	5
SFL28	Our farm household always achieves its livelihood goals and objectives					
SFL29	Our farm household always achieves monthly targeted banana sales					
SFL30	Our farm household always attains its targeted profit levels					
SFL31	Our farm household always attains targeted production output					

SFL32	Our farm household always achieves its desired results					
SFL33	Our farm household always meets the expectations, interests and needs of customers					

THANK YOU FOR YOUR TIME & COOPERATION

Appendix 2: Focus Group Discussion Guide

Study Title: The Influence of Banana Farming Practice on Livelihoods of Farming Households in Honde Valley, Mutasa District, Manicaland Province

Principal Investigator: Mr. Kumbirai Blessing M Nyamwena

Phone number: 0772827125

FOCUS GROUP DISCUSSION GUIDE

Introduction. Introduce yourself to the group, mention why you are meeting and the purpose of the baseline study focus group discussion (FGD). Seek consent to conduct the focus group discussion.

A: Community/Group Identification.

Date of Interview……

1. District…… 2. Ward…… 3. Village……

i. What is the effect of banana planting material being used by the smallholder farmers in Honde valley?
ii. What is the influence of soil fertility and management practices being implemented by the smallholder banana farmers?
iii. What is the consequence of integrated crop pests and diseases management being practiced by the smallholder banana farmers?
iv. What is the magnitude of post-harvest handling techniques being practiced by the smallholder farmers?
v. What is the extent of value addition and marketing of their banana produce being practised smallholder farmers in Honde Valley?

Thank the Interviewee

Appendix 3: Key Informant Interview Guide

Study Title: The Influence of Banana Farming Practice on Livelihoods of Farming Households in Honde Valley, Mutasa District, Manicaland Province

Principal Investigator: Mr. Kumbirai Blessing M Nyamwena

Phone number: 0772827125

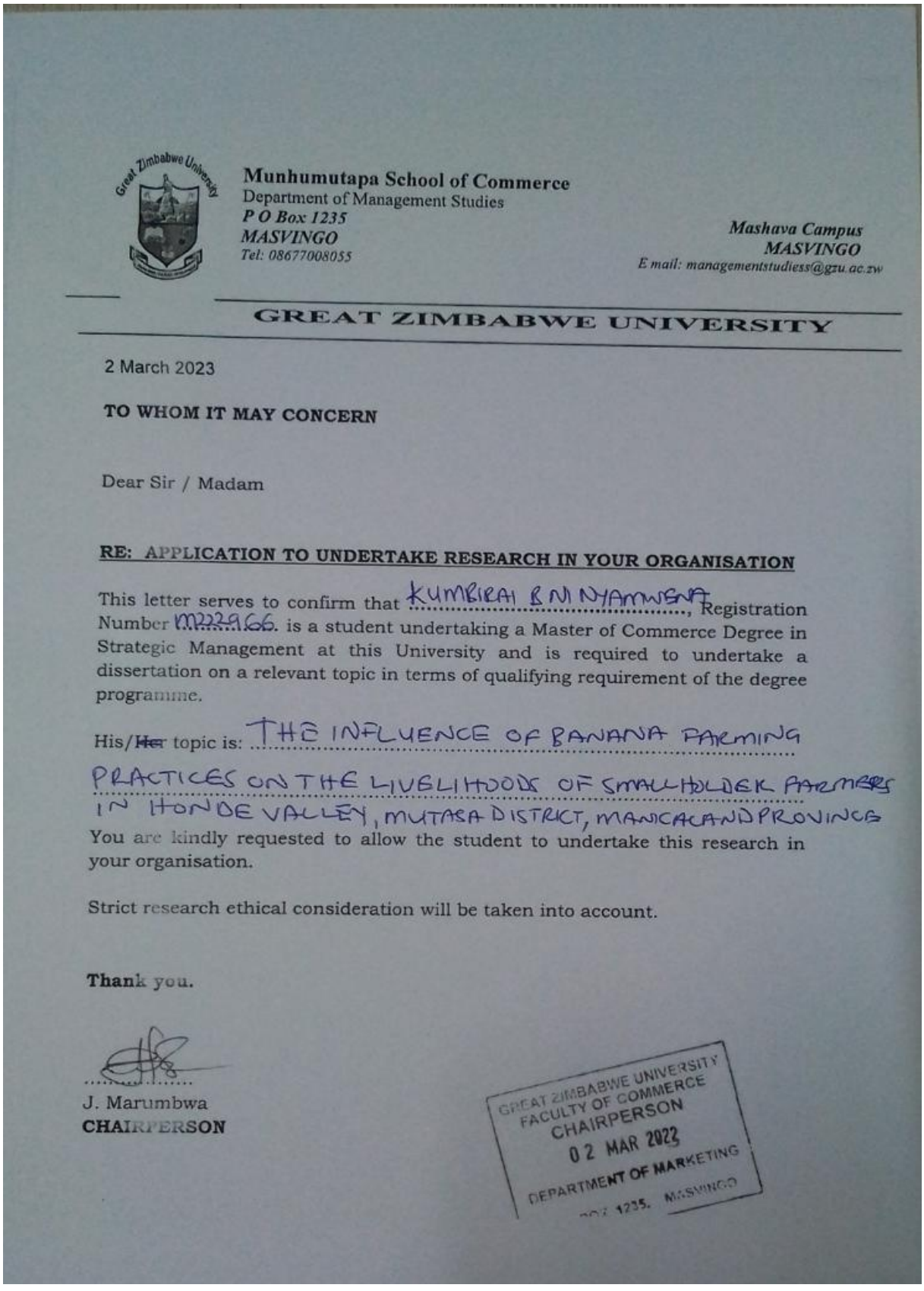
KEY INFORMANT INTERVIEW GUIDE

Introduction. Introduce yourself to the group, mention why you are meeting and the purpose of the baseline study key informant interview (KII). Seek key informant consent.

i. What is the effect of banana planting material being used by the smallholder farmers in Honde valley?
ii. What is the influence of soil fertility and management practices being implemented by the smallholder banana farmers?
iii. What is the consequence of integrated crop pests and diseases management being practiced by the smallholder banana farmers?
iv. What is the magnitude of post-harvest handling techniques being practiced by the smallholder farmers?
v. What is the extent of value addition and marketing of their banana produce being practised smallholder farmers in Honde Valley?

Thank the Interviewee.

Appendix 4: Great Zimbabwe University Letter Requesting to Undertake research in an Organisation



Munhumutapa School of Commerce
Department of Management Studies
P O Box 1235
MASVINGO
Tel: 08677008055

Mashava Campus
MASVINGO
E mail: managementstudiess@gzu.ac.zw

GREAT ZIMBABWE UNIVERSITY

2 March 2023

TO WHOM IT MAY CONCERN

Dear Sir / Madam

RE: APPLICATION TO UNDERTAKE RESEARCH IN YOUR ORGANISATION

This letter serves to confirm that KUMBIRAI B NYAMWENA, Registration Number M223966. is a student undertaking a Master of Commerce Degree in Strategic Management at this University and is required to undertake a dissertation on a relevant topic in terms of qualifying requirement of the degree programme.

His/~~He~~ topic is: THE INFLUENCE OF BANANA FARMING PRACTICES ON THE LIVELIHOODS OF SMALLHOLDER FARMERS IN HONDE VALLEY, MUTASA DISTRICT, MANICALAND PROVINCE

You are kindly requested to allow the student to undertake this research in your organisation.

Strict research ethical consideration will be taken into account.

Thank you.

J. Marumbwa
CHAIRPERSON

GREAT ZIMBABWE UNIVERSITY
FACULTY OF COMMERCE
CHAIRPERSON
02 MAR 2023
DEPARTMENT OF MARKETING
BOX 1235, MASVINGO

Annex 5: AGRITEX Letter Granting Authority to Conduct Research in Mutasa District

All correspondence should be addressed to the Director
Crop and Livestock Production Department
MINISTRY OF LANDS, AGRICULTURE, FISHERIES,WATER AND RURAL DEVELOPMENT

ARDAS
Head office
No. 1 Borrowdale road
Ngungunyana building
Harare

P.O. Box CY 2505, Harare, Zimbabwe Tel: (+263) 04-794381/2
Fax: (+263) 04-790319

2 May 2023

To whom it may concern

AUTHORITY TO UNDERTAKE RESEARCH WITH *AGRICULTURAL* AND RURAL DEVELOPMENT *ADVISORY SERVICES* (AGRITEX) AND SMALLHOLDER FARMERS IN MUTASA DISTRICT WARD 5, 6 AND 7

This letter serves to inform you that Mr Kumbirai Blessing M Nyamwena a Master of Commerce Degree in Strategic Management student at the Great Zimbabwe University (registration number M222966) has been granted authority to conduct his research in Mutasa District (Ward 5, 6, and 7).

Mr Nyamwena's research topic is titled: The Influence of Banana Farming Practice on the Livelihoods of Smallholder Farmers in Honde Valley, Mutasa District, Manicaland Province. The topic is relevant to our organisation's policymakers, planners, researchers, extension staff, and farmers as we aim to improve sustainable agriculture and rural development.

May you kindly assist or support him as he conducts his research and gather information on banana farming practice and its influence on the livelihoods of smallholder farmers.

DEPARTMENT OF AGRITEX
CROPS BRANCH
02 MAY 2023
No. 1 BORROWDALE ROAD
NGUNGUNYANA BUILDING
HARARE, ZIMBABWE

Kind Regards

Rutendo Nhongonhema(Acting Deputy Director)

***Agricultural* And Rural Development *Advisory Services* – AGRONOMY**

Appendix 5: Similarity Index Report

Similarity Index Report

PAPER NAME	AUTHOR
KUMBIRAI NYAMWENA.docx	KUMBIRAI NYAMWENA

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