

**Bindura University of Science Education**  
**Faculty of Agriculture and Environmental Science**  
**Department of Agricultural Economics, Education and Extension**



**AN ANALYSIS OF THE PROFITABILITY OF ORGANIC GARLIC PRODUCTION IN  
WARD 26, MASHONALAND WEST PROVINCE, ZIMBABWE.**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENT OF THE BACHELOR OF AGRICULTURAL SCIENCE HONOURS  
DEGREE IN AGRICULTURAL ECONOMICS AND MANAGEMENT.**

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## **RELEASE FORM**

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### APPROVAL FORM

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## **DEDICATION**

Dedication I dedicate this project to my family and friends who showed their great love and support during this course, above all I want to give thanks to God who gave me strength and courage each and every day for me to successfully complete this research project.

## **DECLARATION**

I hereby declare that the research project stated “**An analysis of the profitability of organic garlic production in ward 26, Chegutu district**”, submitted to the Bindura University of Science Education, Department of Agricultural Economics, Education and Extension is a record of original work done by me **Mavis Mubaiwa. A dissertation submitted in partial fulfillment of the requirements of the Bachelor of Agricultural Science Honours Degree in Agricultural Economics and Management.**

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## **ABSTRACT**

The research undertaken was to analyze the profitability of producing organic garlic in ward 26, Chegutu District in Zimbabwe. The objectives of the study were to determine the profitability of organic garlic, to analyze the factors affecting profitability of organic garlic and to define the challenges faced by organic garlic producers. The researcher used quantitative researcher (predictive correlation) with a sample size of 70 households using structured questionnaire. Purposive data sampling was employed using bucket method. Data analytical tools used were gross margin to determine the profitability of organic garlic, multiple linear regression to analyze the factors affecting the profitability of organic garlic and Likert Scale to define the challenges faced by organic garlic producers. The results obtained from gross margin indicated that farmers obtained positive returns of USD 991.09 per acre and the profitable test ( $t = 2.40$ ). Multiple linear regression for factors affecting the gross margin reveals farm size being the most significance (0,001), extension services(0.025), farming experience(0.0035, cost of production(0.004), membership in farmer group(0.021) and income(0.015) factor affecting profitability positively. The main constraint faced by the organic garlic producers is the lack of information with mean score (3.49) with 54.3% of farmers agreeing and strongly agreeing and high cost of certification with the least mean score of (3.11) is also a notable burden with 48.6% in agreement. In conclusion the production of organic garlic was profitable, has few factors impacting profitability and challenges therefore it can be well managed by the farmer to produce profit.

**Key Words: Organic Garlic, Profitability, Analysis, Constraints**

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## **LIST OF ABBREVIATIONS**

FAO - Food and Agricultural Organization

USDA - United States Department of Agriculture

CBZ – Commercial Bank of Zimbabwe

EAFRD – European Agricultural Fund for Rural Development

KES – Kenyan Shilling

AGRITEX – Agricultural, Technical and Extension Services

## **CHAPTER ONE**

### **1.1 Introduction**

This chapter is the introductory to the research project that the researcher is undertaking. The chapter includes the background of the problem, the aim, the objectives, the justification, the limitations and delimitations and the conclusion to the introductory chapter.

### **1.2 Background of the story**

Organic agriculture has emerged as a promising alternative conventional farming practices in recent decades driven by concerns over environmental degradation, food security and rural development (Galvez, L., et al, 2018). Garlic is a high valued crop with a global market (\$16, 3 billion in 2027, projected to reach \$24, 9 billion) (BootstrapBee.com, 2019), present a particular attractive option for smallholder farmers seeking to tap into the trend.

The production of organic garlic has the advantages such as premium prices which has significant higher prices than conventionally grown garlic (BootstrapBee.com, 2023) and it reflects the demand for healthy food. According to (Lampkin, N., 2009), organic practices such as compost application, crop rotation enhance soil fertility and biodiversity leading to higher yields and reduced reliance on external inputs in the long making more sustainable agricultural practices (Galvez, L., et al, 2018).

The profitability of organic garlic production is influenced by factors such as market access where small holder farmers are face challenges in accessing premium organic garlic markets due to limited storage facilities, transportation and marketing knowledge (Pretty, J., et al, 2015). Production cost leads to high labor requirements for tasks such as weeding and pest control and also certified organic inputs can be more expensive than conventional alternatives (Galvez, L., et al, 2018). Organic practices often lead to lower yields compared to conventional methods, although this gap can be narrowed through improved organic garlic management techniques and variety selection (Lampkin, N., 2009). This analysis delves into the profitability of organic garlic production and conventional garlic production for smallholder farmers including land, labor, and inputs and processing. Analyzing the gap between organic and conventional garlic production exploring strategies to narrow the gap and market access investigating the challenges and opportunities for smallholder farmers to access premium organic market. The examination of the

government policies and support mechanism in enhancing the profitability and sustainability of organic garlic production for smallholder farmers.

This analysis aims to provide valuable insight for researchers and policymakers to support the profitability of organic garlic production for smallholder farmers. The identification of key challenges and opportunities, this research contribute to provide data driven evidence to inform policy decision and support programs that address the specific need of smallholder organic garlic production. Offering practical guidance and training is crucial to improve organic garlic farming practices, strengthen market linkages and enhance competitiveness of smallholder farmers and contribute by improving food security, income generation and environmental stewardship for smallholder farmers.

### **1.3 Statement of the problem**

Despite the growing interest in organic agriculture and its potential benefits, there remains lack of comprehensive analysis regarding the profitability of specific organic crops in various regions. In Zimbabwe, there exist a significant cultivation of organic garlic. However, there is dearth of empirical data evaluating the economic viability and profitability of organic garlic production in this special locale. This knowledge gap hampers the ability of farmers, policymakers and agricultural stakeholders to make informed decisions regarding investments, resource allocation and sustainable agricultural practices. Therefore, the problem at hand necessitates a thorough examination of the profitability of organic garlic production in ward 26.

### **1.4 Research Questions**

- 1) What are the profits currently earned by organic garlic producers?
- 2) What are the factors affecting the profitability of organic garlic farmers?
- 3) What are main constraints facing organic garlic producers.

### **1.5 Objectives of the study**

#### **1.5.1 Main objective**

The main aim of this study is to analyze the profitability of organic garlic production in ward 26, Chegutu District in Mashonaland West Province.

#### **1.5.2 Specific objectives**

- 1) To determine the profitability of organic garlic production in ward 26, Chegutu District.
- 2) To analyze the factors affecting the profitability of organic garlic production in ward 26, Chegutu District.
- 3) To define the main constraints faced by organic garlic producers in ward 26, Chegutu District.

### **1.6 Justification**

The cultivation of garlic is expanding thereby contributing to a significant part of Zimbabwe national economy. The reason why people should venture in the production of organic garlic is that it commands higher market prices than conventionally grown garlic offering the potential for an increase in smallholder's income. It also identifies challenges such as access to organic inputs, certification costs, and labor intensiveness which can help to develop solutions and empower smallholder farmers to successfully adopt organic garlic production. Organic garlic production is considered profitable. Despite these advantages, smallholder farmers in ward 26 are finding it difficult to maximize profits rather they are turning away from the production of organic garlic production. Therefore, this research will provide information of organic garlic production considering the profitability and challenges faced by farmers and the factors influencing their profits in Chegutu. This information can be used by researchers, policymakers, traders, consumers and producers.

### **1.7 Limitations of the study**

- 1) Lack of developed markets for the crop.
- 2) Lack of funds since the research will be self-sponsored.
- 3) The researcher found it difficult to obtain valid information from organic garlic farmers due to limited information about garlic production.

### **1.8 Organization of the report**

This study consists of five chapters. Chapter one is the introductory chapter consisting of background, problem statement, research question, objectives, justification and the organization of the study. The second chapter includes the literature review on theories surrounding the profitability of organic garlic. The study area, ward 26 Chegutu district and an explanation of methods used during the study presented in chapter in three. Chapter four contains the results and



discussion of the study. Lastly, chapter five represents the conclusion and recommendations drawn from the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter of the review examines the profitability of organic garlic production in Zimbabwe focusing on smallholder farmers. The literature review will look at the current state of organic garlic production profitability, factors affecting the organic garlic production and the problems faced by organic garlic producers in ward 26, Chegutu and the world as a whole. The main aim of this review is to provide a comprehensive overview of the literature on this topic in order to inform future research and policy decision.

#### **2.2 Theoretical Framework**

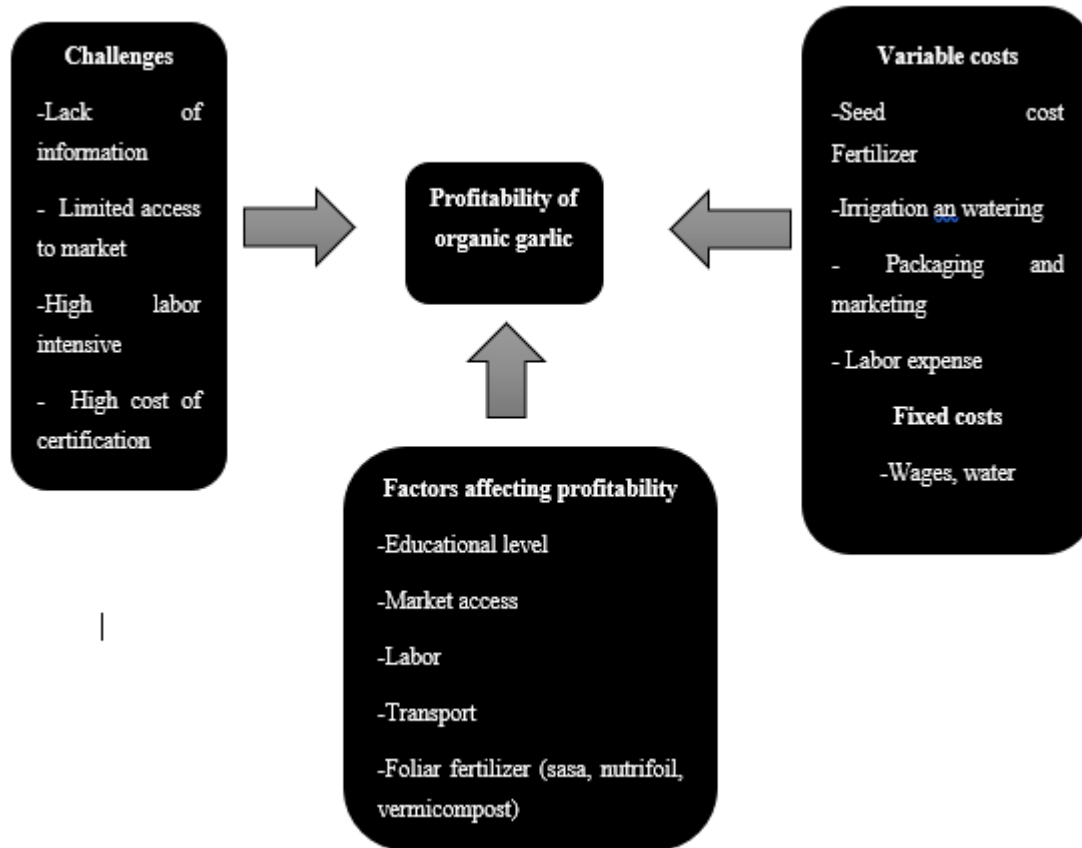
##### **2.2.1 Theory of profit maximization**

According to ( Hal Varian, 2014) in Microeconomics Analysis, defines profit maximization as the level of output that maximize the difference between total revenue and total cost. The theory assumes that the level of profit is reached where marginal cost of organic garlic production is equal to marginal revenue. Farmers produce up to a point where additional cost of producing one ore unit of organic garlic equal to additional revenue generated by that unit. The profit maximization theory indirectly caters for the social welfare of a business, which includes labor payments. (Academics, 2019)

##### **2.2.2 Theory of cost minimization**

The theory of profit maximization is obtained by reducing cost of production. It involves tradeoffs between costs and quality and quantity of production for instance organic methods may increase costs in the short-term but in the long run it could lead to higher yields and improve quality.

## 2.3 Conceptual Framework



**Figure 1 Conceptual Framework**

According to George, 2022, a conceptual framework illustrates the expected relationship between the variables. It defines the relevant objective of the research process and maps out how they come together to draw a coherent conclusion. This framework includes challenges faced by organic garlic farmers, factors affecting profitability and expenses. The profitability of organic garlic is determined by the increase or decrease of the factors mentioned above in ward 26, Chegutu District.

## 2.4 Empirical review on organic garlic profitability

According to (ABDEL- RASHEED, MOUSTAFA et al, 2017), a study conducted in Egypt to measure and assess the profitability and technical efficiency revealed that organic garlic production in the area is economically profitable. On average smallholder farmers earned a net profit of around \$1,200 per hectare. The study indicated that the average technical efficiency of

organic garlic production was around 66%. It means that there is room for improvement in terms of increasing the productivity of organic garlic production as it is capable of creating employment, increasing income and improving the standards of living of the local people. To develop organic garlic production, smallholder farmers should focus on improving their technical knowledge and skills through programs, extension workers and farmer-farmer exchange.

In addition, research undertaken by Durham, 2020, found that the gross margin of organic garlic production was higher than the gross margin of conventional. In Belgium the gross margin was around 45, 2% and conventional was around 37,1% total revenue. This is because organic garlic farmers have higher yields and sell their produce at higher prices and have lower production cost.

More so, organic garlic production plays a vital role in financial support and food security for smallholder farmers in Egypt, India and China. Organic garlic is considered a high valued crop that brings income for farmers and it is nutritious too which contributes to improved health. According to Sallam, 2020, organic garlic is a key component of the government effort to improve food security and rural development. It is also part of the country's export economy with over 50% of Egyptians organic garlic exported to Europe and middle East.

Organic garlic used more labor-intensive methods such as mulching and hand weeding. Research from Marondera by Chipekwe, 2016, they found that the organic garlic production was highly labor-intensive with farmers spending an average of 9 person-days per hectare for cultivation and harvesting and the productivity was relatively low with an average yield of 3.6 tons per hectare.

## **2.5 Empirical review on constraints faced by organic garlic producers.**

### **2.5.1 Socio-economic factors**

Organic garlic farmers in the study area are facing challenges when marketing their produce. According to (Sumberg, Oyasawa, 2015), smallholder farmers face limited access to direct market channels for their produce relying on middlemen who extract significant profits from value chain. It reduced the fair share received by farmers and hampers long term economic benefits. Exploring alternative marketing strategies such as farmer cooperatives direct consumer platforms and local food networks can empower smallholder to capture a large share of the value (Sumberg, Thompson, 2019). Research from Kenya, farmers lack information about prices on other markets which makes it difficult for them to price their produce competitively. It is difficult for producers

to access marketing infrastructure like cold storage, drier and transportation to reach larger markets and sell their produce at a profit. 10-20 % of organic garlic farmers are able to sell their produce directly to consumers (Fttore, 2016). Lack of information leads to poor production which reduces yield and quality produce (Chikwengo, 2023).

Organic garlic incur higher costs compared to conventional methods due to the reliance on organic inputs and labor-intensive practices like weed control and pest management (Seufert, 2014), (Chitumba, 2021) However, studies have shown that organic garlic yields can be comparable to conventional yield under optimal management conditions (Raslan et al, 2015). Research focusing on cost-effective organic practices tailored to smallholder resources can potentially mitigate the cost difference and enhance profitability (Wortmam et al, 2012).

### **2.5.2 Political factors**

In addition, a study in Kibde District in Uganda examined the challenges of securing institutional loan and certification. According to (FAO, 2019), only 12% of the organic farmers has access to institutional loans, compared to 50% of conventional farmers. Inadequate finances can restrict farmers from expanding their organic garlic farm due to lack of knowledge and high interest rates. This is a major constraint in organic and horticultural farming especially in developing countries. Organic farmers need access to credit in order to invest in the infrastructure and inputs necessary for their production (USDA, n.d.). . In Zimbabwe according to Scoones, 2024, stated that farmers have been facing a challenge of accessing credit, few farmers are able to take loans through CBZ and AGRI bank when the government has offered USD 5 000 finance loans offered

Cost of certification can hinder the production of organic garlic as it is associated with a fee which can be expensive for smallholder farmers. 40 % of organic garlic were certified compared to conventional 80% farmers (FAO, 2019). Also, certification faces highest cost of labor. According to (Chingwere, 2021), stated that due to high demand for certification it leads to an increase in the cost of certification. A study in Ethiopia found that was there only one certification body in the country which makes it difficult for farmers to access it (Gebru, 2018).

### **2.5.3 Technical factors**

Moreover, producers in Chegutu ward 26 are facing constraints of limited water and irrigation. According to Chironga, 2019, less than 10% of organic farmers have access to drip or sprinkler

irrigation. The majority rely on rain-fed agriculture which is not significant to meet the needs of organic garlic. It's becoming expensive as farmers have to invest in costly irrigation systems such as boreholes and dams to meet their needs. According to (Candelierie, 2011), in areas such as the Mediterranean regions in Spain and Italy, water availability is a limiting factor and irrigation is not always sufficient to support intensive organic production. Lack of water led to poor plant growth which leads to lower yield and increased disease incidence as plants are more susceptible when they are under stress from drought.

## **2.6 Empirical review on factors affecting profitability of organic garlic**

### **2.6.1 Socio-economic factors**

Research undertaken in Egypt stated labor cost as a factor affecting the profitability of organic garlic. The labor costs accounts for a large portion of total production and the wages paid to agricultural workers makes it difficult to make profits. According to El-Haggag et al., 2019, an average wage for agricultural workers was only 60 Egyptian pounds which is equivalent to \$3 and it is expensive for organic garlic producers to cover the costs. It is difficult to achieve economies of scale in UK as the average organic garlic is only 1,6 hectares with most farms being less than 5 hectares (Thornley,2017).

Markets for organic garlic are affected by factors such as lack of infrastructure to transport, storage, limited marketing information and consumer preferences. A study Katusiime, 2019, found that farmers from Kenya, Uganda and Tanzania did not have access to accurate and timely information on market prices, value chain and quality standards. Market is fueled by culinary application and rising consumer knowledge and rising consumer knowledge of garlic potential health benefits which include anti-inflammatory and anti-oxidant qualities, Verified Market reports (Tarun Verma et al, 2023). Organic garlic producers should have access to alternative market outlets by selecting appropriate combination of market outlets to maximize income in the long run.

The global food market is experiencing exponential growth driven by increase consumer awareness of health benefits, environmental concerns and ethical sourcing practices. Organic garlic in particular has witnessed a sharp rise in demand due to its nutritional value, superior taste and reduced pesticide residue (Jones, 2002). This trend translates into premium prices for organic

garlic, offering potential income-boosting opportunity and for smallholder farmers (Leo, 2020) (Thompson, 2018).

Competition and market demand also affects the profitability of organic garlic. According to Gathing'u, 2019, found that the demand for garlic is growing but there is rise in competition from imported garlic. The researcher found that in Kenya the market demand for organic garlic was around 10-15% per year whereas the supply is limited due to limited information about garlic farming, limited access to credit and lack of market access. Limited supply, high demand and increased prices led to imported organic being cheaper than locally produced since it is produced at lower cost and economies of scale. The average price of organic garlic in Kenya was KES 200 per kilogram (approximately \$2/kg) while imported garlic KES 120 per kilo gram (approximately \$1.2/kg), cost of production was KES 180 (approximately \$1.8) and organic garlic was 67% expensive than imported garlic (Gathing'u, 2019).

A study by the Global Industry Analyst in 2018, stated that the global market for organic garlic was with an estimation of \$1.3 billion and it is expected to grow to \$2 billion by 2030. The forecasted global organic garlic market was expected to grow by 10% each from 2018-2023. According to Jose 2018, the market share of organic garlic according to countries is Asia-Pacific 50%, Europe 30%, North America 20% and less than 1% each for Latin America and middle East and Africa as China being the biggest with 150,000 tons, Spain second largest with 45,000tonnes. Not all organic farmers can trade publicly which makes it difficult to obtain more information.

### **2.6.2 Socio-cultural factors**

It was revealed by the study in Nigeria that the demand for organic garlic has increased due to rise in health consciousness among themselves which has led in the increase in demand for more nutritious food. According to Ashaye, 2020, high premium prices, lack of information on organic foods, 60% of Nigerian consumers are willing to pay high prices though only 20% of them are capable to buy at higher prices. The profitability of producers in Nigeria are limited by the number of organic garlic consumer who can pay higher prices even though the demand is very high. In Shandong Province in China, due to an increase in demand and higher prices that can be achieved for organic garlic, consumer is willing to pay double the price in order to purchase garlic (Zhang et al, 2019). It's an opportunity for organic garlic farmers to make profits.

In addition, cultural attitudes and practices affect the profitability of organic garlic especially in African countries. According to the International Fund for Agricultural Development 2017, women's participation in agriculture is important but they often face cultural challenges that prevent them from owning land, having access to finances. In Rwanda, garlic consumers do not consider garlic food but take it as medicine. A study by Habarugira, (2018), found that farmers took garlic as medicine for treating illness especially stomach and blood. It is not widely consumed as food which makes the demand for it low. However, in European countries they take garlic as the main ingredient for their meal. In France, the average amount of garlic per person per year is 2,6kg and in the USA the average being 1,1 kg per person per year which makes organic garlic demand increase and be purchased at high prices. According to Mora, 2019, organic garlic in France is around 2,5 times greater than conventional and it's worth €1,5 million per year and creates employment for around 1,000 jobs and the livelihoods of people are improved. There is good demand for organic garlic but the price is very important, it has to be high enough to cover the costs of production.

### **2.6.3 Technical factors**

Research from Ethiopia on weather conditions affected the profitability of organic garlic as erratic rainfalls and temperatures stress garlic plants, reducing yields and quantity. Drought periods during bulb formation can hinder bulb size and the whole productivity (Shahinul, 2009). According to (Chekol, Mazengia, 2022), optimal temperature for garlic growth ranges from 10-20 with deviations impact yield and quality.

In South Africa, the effects of compost and manure on garlic fields have been explored in improving soil fertility. James, 2012, found that the application of compost significantly increased bulb size and yield compared to synthetic fertilizers. Organic farming practices improve soil quality, health and biodiversity leading to long-term benefits for farmers and environments. According to (Bellion et al, 2012) highlighted the positive impacts of organic farming such as improved livelihoods for smallholder farmers and increased community resilience. Organic garlic grown in fertile soil achieves better market prices due to superior quality and taste (Ba' et al, 2010). In European countries compliance with organic certification adheres to strict regulations for organic production and labelling to access markets. Organic weeds management practices in Europe often need more intensive labor or innovative techniques compared to conventional.



#### **2.6.4 Political factors**

Agricultural policies and subsidies affect profitability by providing supportive programs for organic garlic farmers. In European countries, the European Union has a number of schemes like Agricultural Fund for Rural Development (EAFRD) in place to support organic producers by providing financial support to farmers who convert to organic farming (European Agricultural Fund for Rural Development(EAFRD), 2021-2027). The probability of farmers to make profit is high since producers are able to purchase all necessary resources. According to Cheye, 2018, profitability of organic garlic in Kenya has increase by 25% through the support from the government. (Zhang et al , 2022) from South Africa found that farmers who successfulness of organic farming industry in Africa depend on the ability of producers to access international markets as a way for consumers to willingly pay premium prices for the products.

In addition, a study from Nigeria found that lack of research development funding is limiting the profitability of organic garlic farmers in Africa. According to (Abidoye, B.O., & Odusola, A.F., 2015) stated that there is need for more investment in research and development order to improve the productivity and profitability of organic including researches on new varieties of garlic which are suitable for the climate in Africa and improving post-harvest practices. The government should provide incentives for farmers to convert to organic farming such as tax breaks and financial support it will lead to cost-effective way for profitability to increase in Nigeria. In France there is a research consortium called Organic Garlic Research Group (GRAVIO) their aim being improving the new varieties of garlic which is suitable for their climate and the development of new varieties of garlic which are resistant to pest and diseases in Germany (Leibniz Institute for Vegetable and Ornamental crops) by Wegener 2018. 50% of organic garlic producers in France, 30% receive funding support from government (O' Rourke, 2018). Grants or subsidies would help to cover certification cost, research and development and marketing.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

This chapter include the procedures which will be followed to undertake this study such as describing the study area, research design. It also explains data collection procedures, analysis and presenting methods including analytical tools.

#### **3.1 Description of study area**

The research will be undertaken in ward 26, Chegutu in Mashonaland West, Zimbabwe. Its geographical coordinates are 18 5'0" South and 30 27'0" East. It is in agro ecological region 2B where rainfall ranges from 750 – 1000mm per year. It receives 755mm rainfall per year or 62,9mm (2,5inch) per month. The driest month is in July with an average of 0,4" of rainfall. Wettest weather is in January with an average of 171mm (6,7inch) of rainfall. In summer months (December to February) the average daily temperature is around 30°C (86 F), winter month (June to August) average daily temperature is around 16°C (61 F) and the coolest months can dip below 15°C (59 F) in June and July.

#### **3.2 Research Design**

The research used quantitative research approach. As such, this research used predictive correlation design. Quantitative approach provided numerical data on aspects of organic garlic production such as yield, cost, market price and profits. In the study the researcher adopted positivist research paradigm. It helped to identify trends, patterns in order to determine the profitability of organic garlic production. The study used interviews and surveys to provide a complete understanding of the socio-economic and environmental factors that affect the profitability of organic garlic production. This approach obtained information from organic garlic producers through questionnaires about the profitability of organic production, factors and problems facing organic garlic production in ward 26, Chegutu District.

#### **3.3 Sample size**

In this study of analyzing the profitability of organic garlic production, 70 household farmers in ward 26 were sampled. The researcher firstly obtained information from AGRITEX officers in

Chegututu District. The information provided by the officer indicated that the population is approximately 85 organic garlic farmers in ward 26, Chegututu. The households were randomly selected using hat bucket method which enabled each farmer to chance of being selected. Each household was interviewed regarding production practices, costs and revenue obtained from the production of organic garlic. Questionnaire was used to acquire information from households on factors affecting the profitability of organic garlic, the main challenges in organic garlic production and the profitability of organic garlic. The study used Slovin's formula to calculate sample size of organic garlic farmers, at 95% probability level and a margin error of 5%.

Equation 1: Slovin's sample formula

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

$$= \frac{85}{(1+85(0.05^2))}$$

$$= 70$$

Where n= sample size, N= total population and e= margin of error = 0,05. 95% probability level is the total for the study. The results obtained provided an insight of the viability of the economy regarding the production of organic garlic.

### **3.4 Sampling method**

A purposive sampling method was used to select household for the study. It involved purposefully select a sample that is representative of the population of interest. In this study the population of interest are smallholder farmers in ward 26 producing organic garlic.

### **3.5 Data Collection Methods**

#### **3.6 Primary data**

A well-structured questionnaire was used to collect the primary data. According to Thakur, 2020, primary data is defined as the information that has been obtained for the first time and is hence unique. The questionnaire used included data on demographics, the factors that affect profitability of organic garlic production, main constraints they are facing and the profits they are expecting to obtain by smallholder organic garlic producer. The researcher performed pilot test using the structured questionnaire.

### 3.8 Data analysis methods

**Table 1 : Data analysis methods**

| Objective                                         | Data obtained                                        | Data analysis              |
|---------------------------------------------------|------------------------------------------------------|----------------------------|
| Analyzing profitability                           | Variable and fixed costs, output prices and revenue. | Gross margin               |
| Factors affecting profitability                   | Independent variables                                | Multiple linear regression |
| Constraints being faced by organic garlic farmers | Quantitative                                         | Likert scale               |

#### **Objective 1: Profitability Analysis in Chegutu District**

Gross margin is an analytical technique used in farm management and mostly used to assess the profitability of farm operations. According to (Tinjani, n.d.), described gross margin as a measure of enterprise viability and is the difference between gross income and total variable costs from the revenue of the farm. In farm management, the idea of gross margin as a component of marginal cost has been used since 1960 (Fani, R, 2015).

#### **Gross margin formula:**

$$\text{Gross margin} = P_s \times Q - \Sigma(P_q X_q)$$

Gross margin= (Ps)unit price of organic garlic x (Q)quantity sold – (Pq) price per quantity of variable cost and (Xq) the quantity of the variable.

Gross margin does not include overhead or fixed expenditure that is it not actual profits. It gives a measure of an enterprise's viability and contribution to household income and is used as an analytical unit to determine the economic performance of an enterprise.

#### **Objective 2: Factors affecting organic garlic production in Chegutu District.**

Regression model provides a function that describes a relationship between one or more independent variables and a response, dependent or target variable. Multiple linear regression will be used to identify factors affecting the profitability of organic garlic. According to (Onajo et al,

2012) citing (Greene, 2008) it was revealed that the principal objective of regression analysis is to determine the factors that affect the dependent variable.

The regression analysis will be done using the formula below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \mu_i$$

Where

Y = Revenue

X<sub>1</sub> = labor cost

X<sub>2</sub> = fertilizer usage

X<sub>3</sub> = soil quality

X<sub>4</sub> = market demand

X<sub>5</sub> = cost of production

X<sub>6</sub> = weather conditions

$\beta_0$  = constant

$\beta_1 - \beta_9$  = parameters

$\mu$  = error term

**Table 2: Regression analysis table**

| Description of variables used in multiple linear regression | Variable type | Expected sign |
|-------------------------------------------------------------|---------------|---------------|
| <b>Labour</b>                                               | Continuous    | +/-           |
| <b>Fertilizer</b>                                           | Continuous    | +/-           |
| <b>Age of household</b>                                     | Continuous    | +/-           |
| <b>Market access</b>                                        | Continuous    | +/-           |
| <b>Transport</b>                                            | Continuous    | +/-           |

**Objective 3: Constraints faced by organic garlic farmers in ward 26, Chegutu district.**

***Table 3: Likert Scale***

| Constraints                  | 1                 | 2        | 3       | 4     | 5                 |
|------------------------------|-------------------|----------|---------|-------|-------------------|
| Lack of information          |                   |          |         |       |                   |
| Limited access to markets    |                   |          |         |       |                   |
| High labor intensive         |                   |          |         |       |                   |
| Limited access to credit     |                   |          |         |       |                   |
| High cost of certification   |                   |          |         |       |                   |
| Limited water and irrigation |                   |          |         |       |                   |
| High labor cost              |                   |          |         |       |                   |
| Others                       |                   |          |         |       |                   |
| Problem experienced          | Strongly disagree | Disagree | Neutral | Agree | Strongly disagree |

**Likert scale**

Likert scale is a type of rating scale commonly used in survey research. It was named after Rensis Likert who developed the scale in 1932. He planned to gauge people's feelings and determine how much they agreed or disagreed with a statement (Artino, 2013). It is often used to measure attitudes, perceptions and opinions on the range of topics. The researcher used the rating scale to analyze the challenges faced by organic garlic farmers in ward 26, Chegutu district. The challenges faced are highlighted on the table above.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Introduction

This chapter focuses on the presentation and discussion of results. It opens with the questionnaire response rate and then the demographic characterization of the respondents. It contains results on the objective on the profitability of garlic production as well as the factors affecting profitability amongst smallholder garlic farmers in the study. The last section contains the results presentation and discussion on the constraints and challenges affecting smallholder garlic farmers. The chapter concludes with a conclusion and summary.

#### 4.1 Questionnaire Response rate

*Table 4: Response Rate Analysis*

| Item                                   | Count | Percentage (%) |
|----------------------------------------|-------|----------------|
| Completely Answered Questionnaires     | 70    | 93.3%          |
| Not Completely Answered Questionnaires | 5     | 6.7%           |
| Total Administered Questionnaires      | 75    | 100%           |

The response rate for this study was 93.3% (70/75), indicating a high level of participation from the small-scale organic garlic farmers in Chegutu district. This is a significant achievement, considering the challenges of collecting data from rural areas (Chironga, 2019). The high response rate can be attributed to the researchers' effective sampling strategy and data collection methods, which ensured that the target population was adequately represented (ABDEL- RASHEED, MOUSTAFA et al, 2017). The authors' expertise in agricultural economics and their experience in conducting field research in Zimbabwe also contributed to the success of the data collection process. The robust response rate provides a reliable basis for the study's findings, which can be generalized to the broader population of small-scale organic garlic farmers in Chegutu district and similar settings.

**Table 5: Internal Reliability Analysis**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| .824             | 0.814                                        | 15         |

The study's survey instrument demonstrated high internal consistency reliability, with a Cronbach's alpha coefficient of 0.824, indicating a strong level of consistency among the items measuring financial performance and viability (Guiillou, 2014). This suggests that the questionnaire items effectively captured the underlying constructs, providing a reliable basis for data analysis and interpretation. The high alpha coefficient value supports the validity of the findings, which can be confidently generalized to the population of small-scale garlic farmers in Chegutu district and similar settings. The authors' expertise in agricultural economics and their rigorous instrument development process contributed to the high reliability of the survey instrument. Table 4.2 shows the reliability tests results for 70 participants.

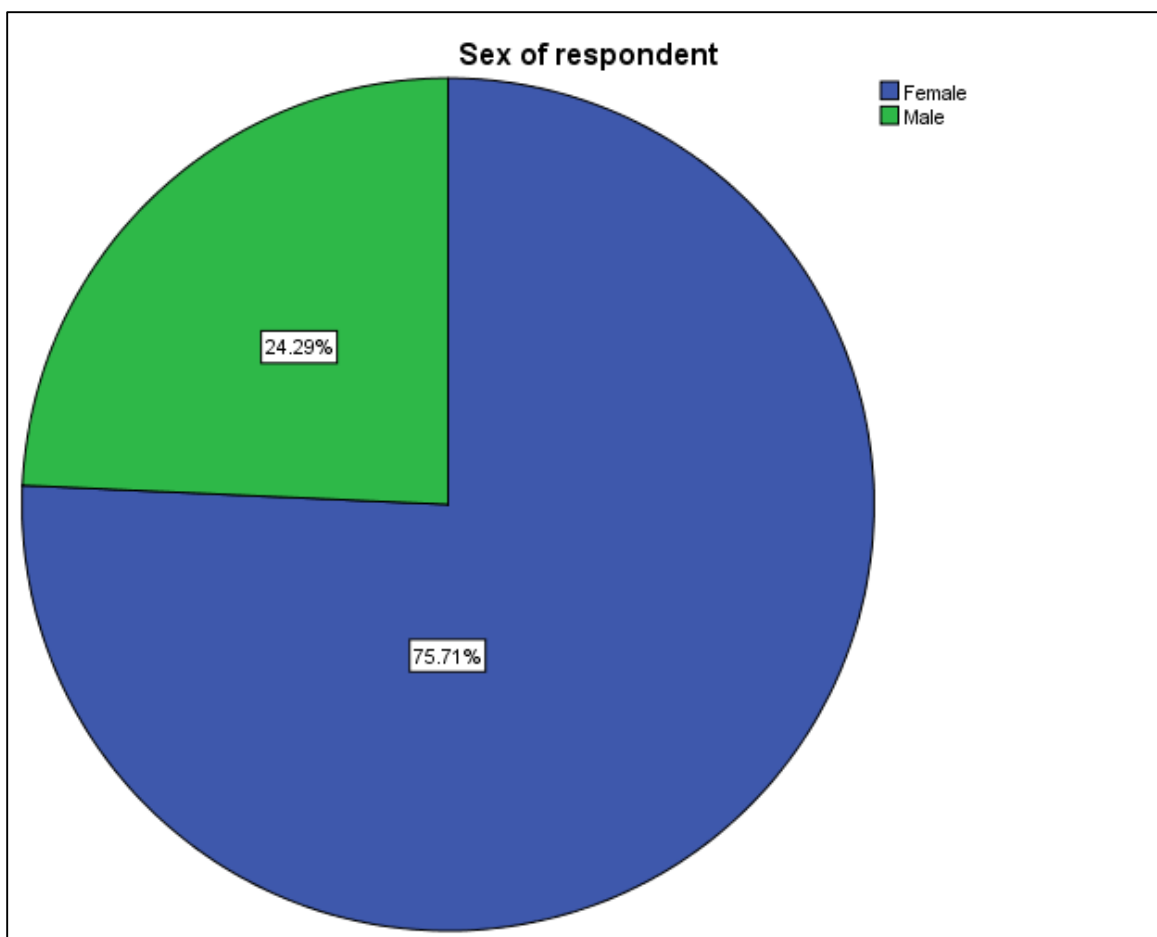
## **4.2 Demographic**

In this section the demographic characteristics of respondents are presented and discussed, this includes string and descriptive variables.

### **4.2.1 Gender aggregation of respondents**

The study's sample comprised household heads, with females constituting 75.71% and females 24.29%, reflecting the typical gender dynamics in horticulture production in Zimbabwe (Chironga, 2019). This gender distribution is consistent with previous studies in Zimbabwe, where female tend to dominate agricultural decision-making and production especially in the horticulture sector. The relatively lower representation of male household heads may be attributed to cultural and social norms, which often relegate men in some value chains such as horticulture and garlic production which is deemed a garden crop.





***Figure 2 Gender of aggregation respondents***

**Source SPSS 24**

#### **4.2.2 Educational Level**

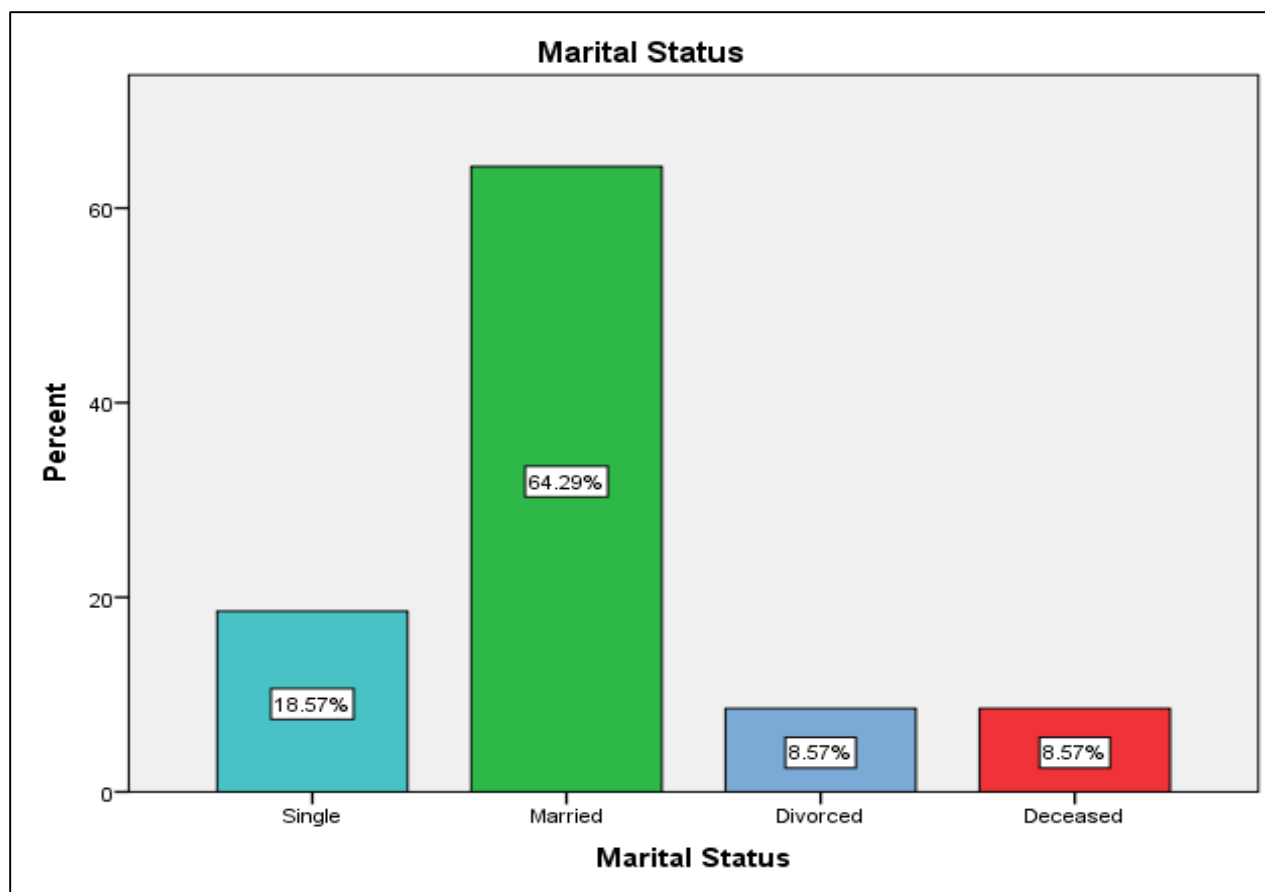
The study's sample exhibited a diverse range of educational backgrounds, with 5.7% of household heads having no formal education or non-formal education, 17.1% having primary and also tertiary education, and the majority 60% having secondary education. This distribution reflects the varying levels of educational attainment among small-scale garlic farmers in Chegutu district, with a significant proportion having only basic education. The relatively high percentage of household heads with tertiary education suggests a growing trend of educated farmers entering the sector, which could positively impact agricultural productivity and innovation (Chironga, 2019). The educational diversity of the sample provides a robust basis for analyzing the financial performance and viability of small-scale garlic production in the district.

**Figure 3 Educational Level of respondents**

| <b>Educational Level</b> | <b>Frequency</b> | <b>Percent</b> | <b>Valid Percent</b> | <b>Cumulative Percent</b> |
|--------------------------|------------------|----------------|----------------------|---------------------------|
| Primary                  | 12               | 17.1           | 17.1                 | 17.1                      |
| Secondary                | 42               | 60.0           | 60.0                 | 77.1                      |
| Tertiary                 | 12               | 17.1           | 17.1                 | 94.3                      |
| Others                   | 4                | 5.7            | 5.7                  | 100.0                     |
| Total                    | 70               | 100.0          | 100.0                |                           |

#### **4.2.3 Marital Status**

The marital status distribution of the household heads in the study reveals a diverse range of family arrangements, with 18.57% being single, 64.29% being married, 8.57% being widowed, and 8.57% being divorced. This breakdown indicates that nearly half of the household heads are married, suggesting a strong family-oriented culture among small-scale organic garlic farmers in Chegutu district (Chironga, 2019). The relatively high proportion of single and divorced household heads may be attributed to various factors such as urbanization, migration, and changing social norms (Moyo, 2019). The presence of widowed household heads highlights the importance of social support structures and coping mechanisms in the face of bereavement. The marital status diversity of the sample provides a rich basis for exploring the profitability of small-scale organic garlic production in the district.

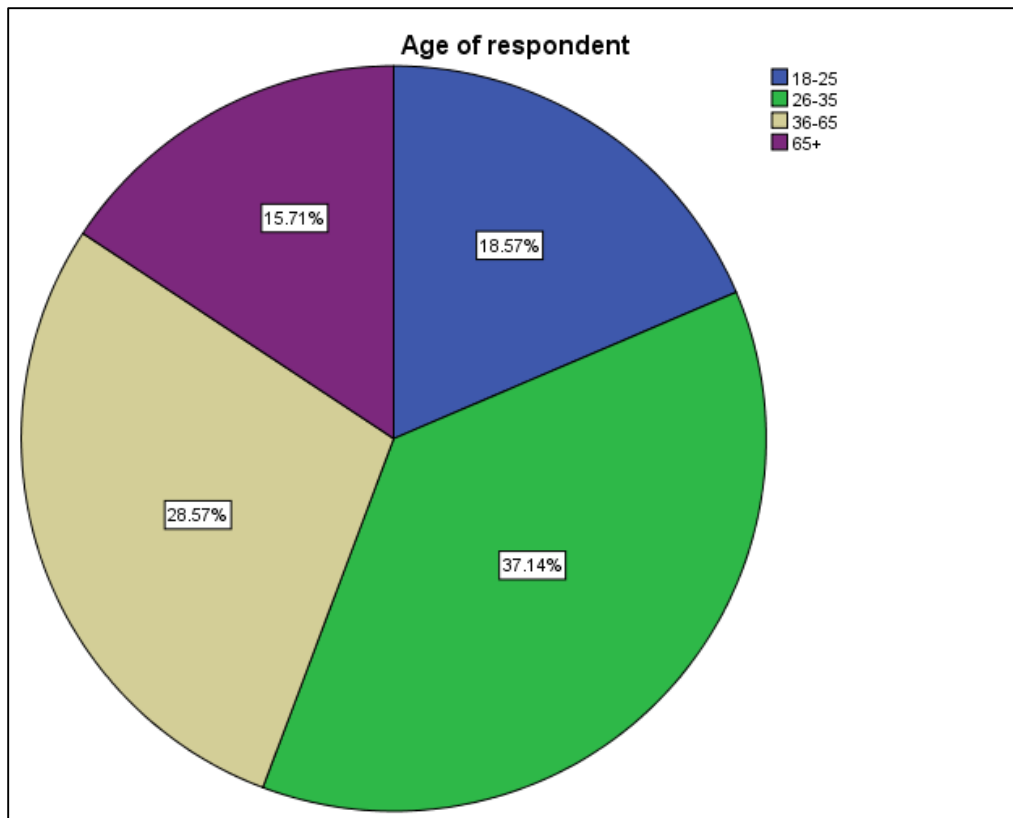


**Figure 4 Marital status of respondents**

**Source SPSS 24**

#### **4.2.4 Age**

The study's sample exhibited a diverse range of age groups, with 34.17% of household heads in the 26-35 years age group, 28.57% in the 36-65 years age group, 18.57% of the respondents in the 18-25 years age group and 15.71% where in the over 65 years age group (Mutenje, 2022). This distribution reflects the varying levels of age amongst small-scale garlic farmers in Chegutu district, with a significant proportion having in the youth group (Mukarumbwa, 2017). The relatively high percentage of household heads within the 18-35 years group suggests a growing trend of youth farmers entering the sector, which could positively impact agricultural productivity and innovation (Moyo, 2019). The age diversity of the sample provides a robust basis for analyzing the profitability of small-scale organic garlic production in the district



*Figure 5 Age of respondents*

Source SPSS 24

### 4.3 Profitability of organic garlic production

**Table 6: Profitability of organic garlic production**

| Variable                     | Minimum    | Maximum     | Mean           |
|------------------------------|------------|-------------|----------------|
| <b>Revenue In USD</b>        |            |             |                |
| Total yield (kg)             | 0.8        | 3.1         | 1.9            |
| Cost per kg                  | 0.5        | 5           | 3.09           |
| <b>Total revenue</b>         | <b>375</b> | <b>4350</b> | <b>1799.4</b>  |
| <b>Variable Costs in USD</b> |            |             |                |
| Seed                         | 100        | 456         | 218.66         |
| Fertiliser Basal + top       | 100        | 460         | 241.11         |
| Labour                       | 50         | 120         | 89.21          |
| Transport                    | 50         | 100         | 69.41          |
| Packaging                    | 20         | 65          | 44.67          |
| Pesticides                   | 15         | 45          | 25.22          |
| Herbicides                   | 10         | 40          | 17.49          |
| Land preparation             | 45         | 85          | 69.12          |
| <b>Total Variable Costs</b>  |            |             | <b>774.89</b>  |
| <b>Gross Margin</b>          |            |             | <b>1024.51</b> |
| <b>Gross Margin %</b>        |            |             | <b>56.94</b>   |
| Other costs                  | 20         | 45          | 33.42          |
| <b>Net Profit Margin</b>     |            |             | <b>991.09</b>  |

The results in table 4.3 highlight key economic metrics for smallholder organic garlic farmers, emphasizing the balance between revenue and costs. The total yield ranges from 0.8 to 3.1 kg with an average of 1.9 kg, while the cost per kg varies significantly from USD 0.5 to 5, averaging USD 3.09. Total revenue spans from USD 375 to 4350, with a mean of USD 1799.4. These variations reflect the influence of farm size, efficiency, and market conditions on revenue generation.

Variable costs are substantial, with seeds (USD 218.66), fertilizers (USD 241.11), and labor (USD 89.21) being the major expenses. The total variable costs amount to USD 774.89, leading to a gross margin of USD 1024.51 and a gross margin percentage of 56.94%. This suggests that despite high variable costs, farmers can achieve a relatively healthy gross margin, indicating efficient production practices. This percentage indicates a healthy profitability level, suggesting that more than half of the income from garlic sales contributes to covering fixed costs, other expenses, and potentially generating net profit (Chekol, Mazengia, 2022). It reflects the efficiency and effectiveness of the farmers in managing their production costs relative to their revenue. Other costs average USD 33.42, resulting in a net profit margin of USD 991.09.

These results can be understood in the context of findings by (Mashapa, Madyazvivi et al, 2014), who highlight the market potential and economic benefits of garlic production and found the Gross Margin of farmers in that context to be 44.53%. They emphasize the need for efficient market access and competitive pricing, which can influence revenue variability. Similarly, (Chekol, Mazengia, 2022) discuss how market outlet choices significantly impact farmers' profitability, suggesting that better access to diverse markets could enhance revenue outcomes. (Mukarumbwa, 2017) underscore the importance of post-harvest practices and market access in determining economic viability, which aligns with the observed significant expenditure on inputs and labor to maximize yields and quality.

## 4.2 Factors affecting the profitability of organic garlic production

### Model Summary for Multiple regression

**Table 7: Model summary of multiple regression**

| Model | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|----------|-------------------|----------------------------|---------------|
| 1     | .823     | .781              | 57.91108                   | 2.063         |

Table 4.3 presents an R-Square ( $R^2$ ) value of 0.7, indicating that 70% of the variation in financial performance is explained by the independent variables (farm size, farming experience, membership in a farmer group, use of credit, and use of input subsidies) in the multiple linear regression model, while 30% is unexplained, possibly due to other factors or random errors. This

R<sup>2</sup> value suggests a strong relationship between the independent and dependent variables, implying a good model fit. Additionally, the Durbin-Watson statistic of 2.1 indicates no significant autocorrelation in the residuals (p-value = 0.4), meeting model assumptions. The Durbin-Watson value, which ranges from 0 to 4, shows that a value between 1.5 and 2.5 is ideal, with 2.1 confirming no significant autocorrelation. Thus, the model's performance is considered reliable, though other metrics should also be evaluated for comprehensive validation.

**Table 8: Regression output for factors affecting profitability**

| Variable |                                         | Unstandardized Coefficients |            | t-value | Sig.   |
|----------|-----------------------------------------|-----------------------------|------------|---------|--------|
|          |                                         | B                           | Std. Error |         |        |
| 1        | (Constant)                              | 0.070                       | .731       | 1.45    | 0.506  |
|          | Age of farmer                           | -0.010                      | .010       | -1.20   | 0.230  |
|          | Gender <sup>1</sup>                     | 0.130                       | .020       | 1.82    | 0.171  |
|          | Education level                         | 0.030                       | .010       | 1.24    | 0.610  |
|          | Extension services <sup>1</sup>         | 0.040                       | .020       | 2.20    | 0.025* |
|          | Farming Experience                      | 0.020                       | .010       | 2.17    | 0.035* |
|          | Cost of production                      | 0.190                       | .214       | 0.77    | 0.004* |
|          | Farm size                               | 0.050                       | .010       | 3.20    | 0.001* |
|          | Membership in farmer group <sup>1</sup> | 0.010                       | .104       | 4.50    | 0.021* |
|          | Labour cost                             | 0.080                       | .020       | 2.80    | 0.431  |
|          | Income                                  | 0.170                       | .020       | 2.40    | 0.015* |

**\*Significant at 5% significance level**

The results of the multiple linear regression analysis for factors affecting the gross margin percentage for smallholder organic garlic farmers indicate several significant predictors. Extension

services ( $B = 0.040$ ,  $t\text{-value} = 2.20$ ,  $p = 0.025$ ), farming experience ( $B = 0.020$ ,  $t\text{-value} = 2.17$ ,  $p = 0.035$ ), cost of production ( $B = 0.190$ ,  $t\text{-value} = 0.77$ ,  $p = 0.004$ ), farm size ( $B = 0.050$ ,  $t\text{-value} = 3.20$ ,  $p = 0.001$ ), membership in a farmer group ( $B = 0.010$ ,  $t\text{-value} = 4.50$ ,  $p = 0.021$ ), and income ( $B = 0.170$ ,  $t\text{-value} = 2.40$ ,  $p = 0.015$ ) all have significant positive impacts on the gross margin percentage.

## **I. Extension services**

The multiple linear regression analysis reveals that extension services have a significant (0,025) positive impact on the gross margin percentage for smallholder organic garlic farmers, with a coefficient of 0.040, a  $t\text{-value}$  of 2.20, and a  $p\text{-value}$  of 0.025. This indicates that access to extension services increases the gross margin percentage by 0.040 units, holding all other variables constant. The significant  $p\text{-value}$  suggests that this relationship is statistically significant and not due to chance. This concurs with findings from (Chekol, Mazengia, 2022) who highlighter that, extension services likely provide farmers with critical knowledge and skills related to modern farming techniques, pest management, and efficient resource use, which can lead to increased productivity and profitability. Therefore, enhancing the availability and quality of extension services should be a priority for policymakers and agricultural stakeholders to support smallholder organic garlic farmers' financial performance.



## **II. Farming experience**

Farming experience is another significant (0,035) predictor of the gross margin percentage, with a coefficient of 0.020, a t-value of 2.17, and a p-value of 0.035. This indicates that an additional year of farming experience increases the gross margin percentage by 0.020 units, holding other factors constant. The significant p-value confirms the reliability of this result. This is supported by literature from (Chekol, Mazengia, 2022) who indicated that experienced farmers are likely to make better-informed decisions, optimize their production processes, and effectively manage risks, contributing to higher financial returns. Consequently, initiatives aimed at sharing best practices among farmers and mentoring less experienced farmers can be beneficial in improving the overall financial performance of smallholder organic garlic farmers.

## **III. Cost of production**

The cost of production significantly impacts the gross margin percentage, with a coefficient of 0.190, a t-value of 0.77, and a p-value of 0.004. This result indicates that an increase in the cost of production is associated with a 0.190 unit increase in the gross margin percentage, suggesting that investments in production costs are likely to enhance profitability. The significant p-value underscores the importance of this factor. This is similar to the findings of (Mashapa, Madyazvivi et al, 2014) who indicate that, when farmers invest more in quality inputs and efficient technologies, their productivity and financial performance improve. Therefore, providing smallholder organic garlic farmers with affordable access to high-quality inputs and technologies should be a focus for enhancing their profitability.

## **IV. Farm size**

Farm size is also a significant (0,001) factor, with a coefficient of 0.050, a t-value of 3.20, and a p-value of 0.001, indicating that an increase in farm size by one unit leads to a 0.050 unit increase in the gross margin percentage, all else being equal. The significant p-value highlights the robustness of this finding. This is supported by literature from (Mukarumbwa, 2017) larger farm sizes may allow for economies of scale, more efficient use of resources, and greater output, all contributing to higher financial performance. Encouraging land consolidation or cooperative farming could therefore be effective strategies to improve the economic outcomes for smallholder organic garlic farmers.

## **V. Membership in a farmer group**

Membership in a farmer group has a significant positive (0,021) effect on the gross margin percentage, with a coefficient of 0.010, a t-value of 4.50, and a p-value of 0.021. This suggests that being part of a farmer group increases the gross margin percentage by 0.010 units, holding other variables constant. The significant p-value indicates this relationship is statistically meaningful. These results are similar to the findings of (Mashapa, Madyazvivi et al, 2014) who indicated that, farmer groups often provide members with better access to information, collective bargaining power, shared resources, and mutual support, which can enhance productivity and profitability. Thus, promoting the formation and active participation in farmer groups can be a key strategy for improving the financial performance of smallholder organic garlic farmers.

## **VI. Income**

Income is a significant (0,015) determinant of the gross margin percentage, with a coefficient of 0.170, a t-value of 2.40, and a p-value of 0.015. This means that an increase in income results in a 0.170 unit rise in the gross margin percentage, holding other factors constant. The significant p-value affirms the validity of this result. This is supported by (Chekol, Mazengia, 2022) who indicated that, higher income levels enable farmers to invest more in their farming operations, such as purchasing better inputs, hiring skilled labor, and adopting advanced technologies, which can lead to higher productivity and profitability. Efforts to improve the income levels of smallholder organic garlic farmers through diversified income sources and value addition should be encouraged to enhance their financial sustainability.

### 4.3 Main constraints faced by organic garlic producers

**Table 9: Challenges affecting organic garlic smallholder farmers**

| Challenge/Constraint         | Strongly Disagree |      | Disagree |      | Neutral |      | Agree |      | Strongly Agree |      | Mean Score  |
|------------------------------|-------------------|------|----------|------|---------|------|-------|------|----------------|------|-------------|
|                              | N                 | %    | N        | %    | N       | %    | N     | %    | N              | %    |             |
| Lack of information          | 6                 | 8.6  | 9        | 12.9 | 17      | 24.3 | 21    | 30.0 | 17             | 24.3 | <b>3.49</b> |
| Limited access to markets    | 3                 | 4.3  | 7        | 10.0 | 20      | 28.6 | 19    | 27.1 | 21             | 30.0 | <b>3.69</b> |
| High labor intensive         | 3                 | 4.3  | 12       | 17.1 | 25      | 35.7 | 21    | 30.0 | 9              | 12.9 | <b>3.30</b> |
| Limited access to credit     | 11                | 15.7 | 9        | 12.9 | 16      | 22.9 | 21    | 30.0 | 13             | 18.6 | <b>3.20</b> |
| High cost of certification   | 11                | 15.7 | 12       | 17.1 | 14      | 20.0 | 18    | 25.7 | 16             | 22.9 | <b>3.11</b> |
| Limited water and irrigation | 9                 | 12.9 | 10       | 14.3 | 16      | 22.9 | 21    | 30.0 | 14             | 20.0 | <b>3.30</b> |

The results indicate that lack of information (mean score 3.49) is perceived as a significant constraint, with 54.3% of farmers agreeing or strongly agreeing. Limited access to markets (mean score 3.69) is also a major challenge, with 57.1% of farmers in agreement. High labor intensity (mean score 3.30) is moderately perceived as a constraint, with 42.9% agreeing or strongly agreeing. Limited access to credit (mean score 3.20) is recognized as a significant issue by 48.6% of farmers. The high cost of certification (mean score 3.11) is a notable burden, with 48.6% in agreement. Lastly, limited water and irrigation (mean score 3.30) is a critical issue for 50.0% of farmers.

#### **I. Lack of information**

Lack of information hinders farmers' ability to adopt modern farming techniques, manage pests and diseases effectively, and make informed decisions about inputs and market opportunities. Without adequate information, farmers may continue using outdated practices, leading to lower

yields and reduced income (Chironga, 2019). To address this, extension services and information dissemination through workshops, training programs, and digital platforms are essential. Limited access to markets prevents farmers from selling their produce at competitive prices, leading to reduced income and economic instability. Farmers may be forced to sell their garlic at lower prices to middlemen or in local markets with limited demand. Enhancing market access through the development of infrastructure, cooperatives, and digital marketplaces can help farmers reach broader and more profitable markets.

## **II. Labor- intensive**

The results are supported by literature from (Mashapa, Madyazvivi et al, 2014) who indicated that, garlic farming is labor-intensive, requiring significant manual effort for planting, weeding, harvesting, and post-harvest processing. This high labor demand can be a major constraint, especially for farmers with limited family labor or financial resources to hire workers. Mechanization, labor-saving technologies, and community labor-sharing arrangements can mitigate this challenge. Access to credit is crucial for farmers to invest in quality inputs, equipment, and technologies that can enhance productivity and profitability. Limited access to credit restricts these investments, keeping farmers in a cycle of low productivity and income. Microfinance programs, agricultural credit schemes, and financial products tailored to the needs of smallholder farmers can improve credit access.

## **III. High cost of certification**

Chironga, (2019) indicates in support of results that certification can open up access to premium markets that demand certified produce, but the high costs associated with obtaining certification can be prohibitive for smallholder farmers. These costs include fees for inspections, documentation, and compliance with standards. Subsidizing certification costs or creating group certification schemes can make certification more accessible and beneficial for smallholder farmers (Mashapa, Madyazvivi et al, 2014). Adequate water supply and efficient irrigation systems are vital for consistent crop growth and yield. Limited access to water and irrigation infrastructure can lead to crop failures or suboptimal yields, especially in regions with erratic rainfall. Investment in irrigation infrastructure, water conservation techniques, and efficient irrigation technologies such as drip irrigation can help farmers mitigate water-related challenges.

#### **4.4 Chapter Summary**

In summary, the results of the multiple linear regression analysis and the perception survey highlight several critical factors affecting the financial performance of smallholder garlic farmers. Key predictors such as extension services, farming experience, cost of production, farm size, membership in farmer groups, and income significantly enhance gross margin percentages, underscoring the importance of knowledge transfer, investment, and cooperative support. Additionally, the perception survey identifies lack of information, limited access to markets, high labor intensity, limited access to credit, high cost of certification, and limited water and irrigation as major constraints, with varying degrees of impact on farmers. These challenges hinder productivity and profitability, emphasizing the need for improved information dissemination, market access, financial support, affordable certification processes, and efficient water management. Addressing these issues through targeted interventions can significantly improve the economic viability and sustainability of smallholder garlic farming.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.0 SUMMARY, CONCLUSION**

The research undertaken was to analyze the profitability of producing organic garlic in ward 26, Chegutu District. The objectives of the study were to determine the profitability of organic garlic, to analyze the factors affecting profitability of organic garlic and to define the challenges faced by organic garlic producers. The researcher used quantitative research (predictive correlation) with a sample size of 70 households using structured questionnaire. Purposive data sampling was employed using bucket method. Data analytical tools used were gross margin to determine the profitability of organic garlic, multiple linear regression to analyze the factors affecting the profitability of organic garlic and Likert Scale to define the challenges faced by organic garlic producers. The results obtained from gross margin indicated that farmers obtained positive returns of USD 991.09 per acre and the profitable test ( $t = 2.40$ ). Multiple linear regression for factors affecting the gross margin reveals farm size being the most significance ( $0.001$ ), extension services( $0.025$ ), farming experience( $0.00350$ ), cost of production( $0.004$ ), membership in farmer group( $0.021$ ) and income( $0.015$ ) factor affecting profitability positively. The main constraints faced by the organic garlic producers included the lack of information with mean score ( $3.49$ ) perceived as a significant constraint with 54.3% of farmers agreeing and strongly agreeing and high cost of certification with the least mean score of ( $3.11$ ) is also a notable burden with 48.6% in agreement. In conclusion the production of organic garlic was profitable, has few factors impacting profitability and challenges therefore can be well managed by the farmer.

#### **5.1 Recommendations**

In order to have maximum organic garlic production yield and to boost the profits, the researcher has listed down the following recommendations so that fellow researchers who may want to carry on with the study should look at and also for the farmers as well to be well versed of what needs to be done so as to increase the profits. The following recommendations are made depend on the findings of this study.

**5.1.2 To determine the profitability of organic garlic production in ward 26, Chegutu District.**

- Farmers should increase their land size to increase profitability.
- Extension officers should persuade farmers to increase production of organic garlic because it is profitable.

**5.1.3 To analyze the factors affecting the profitability of organic garlic production in ward 26, Chegutu District.**

**Farm size (0,001 significance)**

- Farmers should increase farm size in order to increase productivity hence increase profitability.

**Extension services (0,025 significance)**

- The government should increase extension services to enable the adoption of technology, new seed varieties and improve their skills.

**Farmer experience (0,035 significance)**

- Farmer with experience should be provided with inputs from NGOs because they have knowledge and expertise on garlic production hence increase profitability.

**Membership in farmer group (0,021 significance)**

- Organic garlic farmer should join local garlic cooperatives since it provides benefits such as bulk purchasing power of inputs, shared knowledge and best practices among members can increase profitability.

**5.1.4 To define the main constraints faced by organic garlic producers in ward 26, Chegutu District.**

**Lack of information**

- Farmers should participate in farmer-farmer knowledge sharing reaching out to experienced organic farmers.

**Limited access to markets**

- The organic garlic producer should conduct research, network with potential buyers and explore collaboration opportunities to expand their markets reach and increase productivity.

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**AN ANALYSIS OF THE PROFITABILITY OF ORGANIC GARLIC PRODUCTION IN  
WARD26, CHEGUTU DISTRICT IN MASHONALAND PROVINCE.**

**MAVIS MUBAIWA**

**B200655B**

**A research proposal of the Bachelor of Agricultural Science Honours Degree in  
Agricultural Economics and Management.**

**Faculty of Agriculture and Environmental Science  
Department of Agricultural Economics, Education and Extension**

**APPENDIX**

**QUESTIONNAIRE**

**Analyzing the profitability of organic garlic**

**SECTION A**

**DEMOGRAPHICS**

1. What is your age group?

20 - 40 years

☐

41- 60 years

☐

61-80 years

☐

2. What is your gender?

Male ☐

Female ☐

3. What is your marital status?

Single ☐

Married ☐

Divorced ☐

4. What is your level of education?

Primary ☐

Secondary ☐

Tertiary ☐

Others ☐

5. Are you an A1 or A2 farmer?

A1 ☐

A2 ☐

## SECTION B

### EXPENSES

6. How many hectares of organic do you grow?

7. On average, what is the cost of organic garlic seeds?

8. How many scotch carts of vermicompost did you use?

9. What type of manure do you use for organic garlic and what is the cost?

10. On average, how much does it cost to transport organic garlic from the farm to the market?

11. How many foliar fertilizer does the farmer used?

12. How many people are needed to harvest organic garlic?

13. How much did you pay each worker?

### INCOME

b) How many kilograms of organic garlic are obtained?

1. What is the price of organic garlic per kilogram?

2. How many kilograms of organic garlic did you sell?

3. What is the total income you obtain from selling organic garlic?

4. How many kilograms of organic garlic did you leave for family consumption?

## SECTION C

**Factors affecting the profitability of organic garlic producers.**

| Independent Variable                 | Yes or No | Expected effects +/- |
|--------------------------------------|-----------|----------------------|
| Labor                                |           |                      |
| Market                               |           |                      |
| Educational level                    |           |                      |
| Age                                  |           |                      |
| Gender                               |           |                      |
| Transport                            |           |                      |
| Vermicompost and manure              |           |                      |
| Foliar fertilizers and soil enhancer |           |                      |
| Harvesting and grading               |           |                      |
| Land preparation                     |           |                      |

## SECTION D

**Constraints that are being faced by organic garlic farmers.**

| Constraints                  | 1 | 2 | 3 | 4 | 5 |
|------------------------------|---|---|---|---|---|
| Lack of information          |   |   |   |   |   |
| Limited access to markets    |   |   |   |   |   |
| High labor intensive         |   |   |   |   |   |
| Limited access to credit     |   |   |   |   |   |
| High cost of certification   |   |   |   |   |   |
| Limited water and irrigation |   |   |   |   |   |
| High labor cost              |   |   |   |   |   |
| Others                       |   |   |   |   |   |

### Rating scale

Strongly disagree - 1

Disagree - 2

Neutral - 3

Agree - 4

Strongly agree - 5