

**EFFECTS OF MARKETING CHANNEL CHOICE ON THE PROFITABILITY OF  
SMALLHOLDER VEGETABLE FARMERS IN LERIBE DISTRICT OF LESOTHO**

**By**

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## DECLARATION

I, Boitumelo Seatle, hereby declare that this thesis is my own original work and that other scholars' works referred to herein have been duly acknowledged. I also declare that this thesis is original and has not been submitted elsewhere for a degree.

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Boitumelo Seatle

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Date

## CERTIFICATION

We the undersigned, certify that the work reported herein meets the standards required for Thesis for the Degree of Master of Science in Agri-business Management.

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## **DEDICATION**

To my late mother `Mamalatsi Agnes Seatle.

## ACKNOWLEDGEMENTS

First and most importantly, I thank God Almighty, for giving me strength, guidance, wisdom, and perseverance through this study.

I wish to acknowledge my supervisor, Doctor A.M Rantlo for great supervision. I am so grateful for the assistance, commitment, dedication, patience, and the follow-ups during the course of this study. Thank you so much for believing in me, and may God continuously bless you.

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## ABSTRACT

Smallholder vegetable farming has the potential to improve the income of farmers due to the profitability associated with the choice of proper marketing channel. Vegetables profitability vary across different marketing channels. The study sought to assess the effects of market channel choice on the profitability of smallholder farmers in Leribe district Lesotho. Specifically, the study identified the marketing channels used by smallholder vegetable farmers, identified factors influencing the choice of vegetable marketing channel, as well as determined the profitability of selling vegetables through each of the marketing channels in Leribe district of Lesotho. A stratified simple random sampling technique was used to select a sample of one hundred and eleven (111) respondents in the study area. Cross-sectional data was then collected from smallholder vegetable farmers with the use of closed-ended questionnaire. The data was processed with the use of Statistical Package for Social Science (SPSS) and Ms. Excel. The data was analysed using descriptive and inferential statistics (Pearson` Chi-square test), binary logistics regression as well as gross marginal analysis. The results revealed that smallholder vegetable farming in the study area was mainly dominated by young, aged female farmers. The identified marketing channels were the formal and informal marketing channels with most (71.05%) farmers in Leribe district using the informal marketing channel. Time of payment ( $p=0.033$ ) and price determination factor ( $p=0.030$ ) were the factors that influenced the choice of vegetable marketing channel. The study further affirmed that sales of vegetables through formal marketing channel was more profitable than sales through the informal marketing channel in the study area. Based on the results, the study recommends the formulation of agricultural policy in Lesotho to incorporate the promotion of farmers access to formal markets and capacity building of extension officers on agricultural production and marketing in order to assist farmers to produce according to formal market requirements.

**Keywords: Smallholder vegetable farmers, marketing channel, profitability**

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## **LIST OF ABBREVIATIONS**

BOS	Bureau of Statistics
CSA	Climate Smart Agricultural Practices
EIF	Enhanced Integrated Framework
FAO	Food Agriculture Organization
GDP	Gross Domestic Products
GM	Gross Margin
MAMFS	Ministry of Agriculture Marketing and Food Security
NSDP	National Strategic Development Plan
SACU	South African Customs Union
SADC	Southern African Development Community
SADP	Smallholder Agriculture Development Project
SPSS	Statistical Package for Social Scientists
WFP	World Food Programme

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Lesotho is mainly a rural economy, with over 70 percent of rural population dependent on agriculture and other activities for livelihood purposes (Muroyiwa *et al.*, 2020). Most poor people (80.4 percent) live in the rural areas and are predominantly engaged in subsistence agriculture, which employs approximately 38 percent of the labour force (World Bank, 2019; Bureau of Statistics, 2020). The majority of the agricultural sector in Lesotho consists of pastoral farming (livestock) and only about 9 percent of Lesotho's land is suitable for crop farming (Mafongoya and Ajayi, 2017).

In Lesotho, the agricultural sector is mainly dominated by small-scale farmers and about 90 percent are smallholders, and the remaining 10 percent are classified as commercial farmers (Prifti *et al.*, 2020). Smallholder farming is characterized by market-oriented horticulture farmers, a mixture of modern and traditional production techniques used while these farmers keep some records. Most farmers sell their produce to informal market, although some supply institutional buyers and typically farm on less than two hectares (Reva, 2019).

Smallholder vegetable production has a potential to improve livelihoods through enhancing food security, job creation, improve access to income and general poverty reduction in most African countries (Mukarumbwa *et al.*, 2018). Lesotho has good potential to increase vegetable production, reduce imports, and increase the incomes of farmers, since protected vegetable farming has taken off in the past five years in Lesotho. Cultivation of many vegetables is scale neutral and even smallholder farmers with less than a hectare of land can operate at a profit in Lesotho (Reva, 2019).

The choice of a marketing channel is one of the important decisions a farmer can make since it has a high impact on farm profitability (Lee, Liu and Chang, 2020). The market structure of vegetables in Lesotho consists of formal and informal marketing channels. With formal marketing channel, farmers must comply with the stringent quality standard and regular volume requirements of formal buyers as well as be willing to accept that prices may be below those in informal markets. Hence, farmers may experience high transaction costs under such circumstances and they often fail to meet market requirements such as high quality,

quantity and product specifications (Christopher, 2020). For this study, the formal marketing channels used are the wholesale or supermarket, processing firms and export market.

In contrast to formal markets, informal markets provide the shortest and simplest distance between the farmer and the consumer, and as a result, it has become the most popular option, amongst smallholder farmers (Ferris *et al.*, 2014). Through this option, smallholder farmers transact directly with the ultimate consumer (Ngoro *et al.*, 2015). On-farm or direct sales to the consumer offer the greatest profit margin for the producer because all middlemen and their fees are eliminated. For this study, the informal marketing channels used are the farm gate, street vendors and sales along the roadside.

Rantlo, Tsoako and Muroyiwa, (2020) highlighted that, farmers choices of marketing channels are influenced by different institutional factors. In agribusiness, profitability critically depends on the choice of proper marketing channels (Zhang *et al.*, 2017).

Profitability in agribusiness is highly dependent on the selection of appropriate marketing channels and platform (Numanovich and Abbasxonovich, 2020). The smallholder farmers will choose a marketing channel that maximizes their utility and minimizes transaction costs, using the available information (Cheelo and van der Merwe, 2021). According to Okelai, Isoh and Angundaru, (2020), the nature and quality of the marketing channels and the agro-commodity markets used by smallholder farmers is proven to have a direct effects on farm profitability. Hence access to markets is a key determinant of smallholder farmer profitability, and has the motivational effect of increasing production (Okelai *et al.*, 2020).

Findings from the empirical study conducted by Naseer *et al.*, (2019), showed that farmers profitability was positively affected by participation in modern (formal) market channel. That is, farmers selling to the modern marketing channels were better off than the traditional informal marketing channel. Thus, the study seeks to analyse the effects of marketing channel choice on the profitability of smallholder vegetable farmers in Leribe district.

## **1.2 Statement of the Research Problem**

There are multiple actors in fresh produce business in Lesotho. According to the study by Reva (2019), local grocery stores account for 35%, supermarkets 30%, individual traders 20% and Chinese owned stores 15% of the retail sector while Basotho vegetable farmers account for 100% of the farm sector.

Smallholder vegetable farmers in Leribe district have multiple distribution channels, which absorb most of the produce from poor to high quality. Vegetable farmers sell their produce through both formal and informal vegetable channels found across the country.

However, most vegetable farmers live in abject poverty despite their participation in vegetable output markets and high demand for vegetables in the country. This scenario has led to the study seeking to investigate the effects of marketing channel choice on the profitability of smallholder vegetable farmers in Leribe district.

## **1.3 Research Questions**

- What are the marketing channels used by smallholder vegetable farmers in Leribe district?
- Which factors influence the choice of vegetable marketing channel?
- Which marketing channels is more profitable than the others?

## **1.4 Objectives**

### **1.4.1 Main Objective**

To investigate the effects of marketing channel choice on the profitability of smallholder vegetable farmers in Leribe district-Lesotho.

### **1.4.2 Specific Objectives**

**Objective 1:** To identify marketing channels used by small scale vegetable farmers.

**Objective 2:** To examine the factors influencing choice of vegetables marketing channel.

**Objective 3:** To determine the marketing channel that is profitable from vegetables sales.

## **1.5 Hypothesis**

- Farmers who sell vegetables in formal marketing channels are more likely to make profit than farmers who sell vegetables through the informal marketing channels.
- Socio-economic characteristics of the farmers are more likely to influence the choice of marketing channel.

## **1.6 Justification of the Study**

Although vegetable production has reportedly increased, emerging smallholder commercial farmers often suffer from challenges in accessing formal markets. Many farmers sell their produce to street vendors and in informal community markets rather than to formal buyers that offer better prices (Reva, 2019).

In Lesotho, smallholder farmers find it difficult to participate in commercial markets due to the institutional constraints, such as poor infrastructure, lack of market transport, dearth of market information, insufficient expertise on grades and standards, inability to have contractual agreements and poor organisational support (Rantlo, Tsoako and Muroyiwa, 2020).

Based on the above facts, information from this study will be vital to extension officers in advising farmers on the proper marketing channel choice in vegetables marketing in order to ensure profitability. Policy makers may also use this information to develop new and amend existing policies in an effort to assist small vegetable farmers to participate in appropriate output markets. Farmers may use this information when deciding on channels through which to sell their produce for profitable marketing.

## **1.7 Limitations of the Study**

- The probable limitation to the study was the low response rate due to time constraint and reluctance of respondents to give information.
- Some respondents failed to recall information accurately, and this might have led to biased data.



- In addition, there was dishonesty among other respondents, and this has limited the study outcome.

### **1.8 Delimitations of the Study**

This study focused only on smallholder vegetable farmers in Leribe district. In addition, it was only limited to vegetable marketing and profitability.

### **1.9 Outline of the study**

The second chapter covers a literature on smallholder farming, market channel choice and farm profitability. The third chapter outlines the methodology used in the study, data collection method, sampling procedure and data analysis strategies are discussed. A description of the area is outlined in terms of geography, climate, population, economy, and agriculture. The results presentation, interpretation and discussion are covered in chapter four. Lastly, chapter five presents' conclusions and recommendations of the research.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

The purpose of this chapter is to review the relevant literature related to market channel choice among smallholder farmers and farm profitability. This will help to identify and understand the effect of market channel choice on the profitability of smallholder vegetable farmers. The chapter is structured into seven themes: definition of smallholder farming, importance and roles of smallholder farming, challenges facing smallholder farmers in developing countries, farming systems pursued by smallholder farmers in Lesotho, marketing channels and farm profitability, factors influencing market channel choice and lastly the relationship between market channel choice and farm profitability.

### **2.1 Definition of smallholder farming**

It is estimated that 75 percent of the world's poor reside in rural areas and that 50 percent of the poor within developing countries are smallholder farmers (Dou *et al.*, 2020). Smallholder farming in Africa is highly diverse due to the heterogenous nature of Africa's geography, agroecology, socio-economics and demography (Kamara *et al.*, 2019). Consequently, definitions and characteristics of smallholder farming in Africa varies depending on the context and geographic location (Shabangu, 2017). According to Gollin, (2014), there is no universally accepted definition of smallholder farming , and often the term smallholder is used interchangeably with family-farmer, small-scale, resource poor, subsistence, and low income (Garner and de la O Campos, 2014; Kamara *et al.*, 2019).

Most of the existing definitions are centered on some of the common characteristics of smallholder farmers such as access to land, land size technology and market orientation (DCED, 2012; Mutero, Munapo and Seaketso, 2016). According to Kamara *et al.*, (2019), smallholder farming can be generally defined as cultivating less than 2 hectares of land, mainly relying on family labour, with limited (natural, physical, social, financial, and human), low-input technology and having limited access to markets.

Smallholder farming as defined by World Food Programme, (2019), includes households involved in agricultural production on relatively small-plots of land. It also involves direct operation by farmers who use family labor mainly manual management (Mukwedeyya, 2018). Under smallholder farming the family is mainly dependent on the significant proportion of farm income. In support of this statement, Mmbando, (2014), explains that due to vulnerability to economic and climatic shocks in the field of agribusiness, smallholder farmers tend to spread their risk by diversifying into off farm farming activities for additional income.

In Lesotho and for the purpose of this study, smallholder farming is characterized by market-oriented horticulture farmers, a mixture of modern and traditional production techniques used, farmers keep some records. Most farmers sell their produce to informal market, although some supply institutional buyers and typically farm on less than two hectares (Reva, 2019).

## **2.2 Importance and roles of smallholder farming**

According to Von Braun *et al.*, (2021) there are various estimates of the number of small farms in the world, but they all suggest these farms are numerous. However, Lowder *et al.* (2016), used agricultural census data from 167 countries to estimate that, of the total 570 million farms in the world, 475 million farms have less than 2 hectares , dominating agriculture in most low- and middle low-income countries. Around 500 million smallholder farms produce more than 80 percent of the food consumed in large parts of the developing world thereby contributing to food security and poverty reduction (WFP, 2019). Over 80% of the food utilized by underdeveloped and developing countries is produced by smallholder farmers (Donatti *et al.*, 2019).

Smallholder farms contribute towards achieving household food and nutrition security (Von Braun *et al.*, 2021). Smallholder farms are important to the overall food security of low- and middle low-income countries. Herrero *et al.* (2017), noted that farms less than 5 hectares are responsible for 53 percent of the global production of food calories for human consumption. He further reported that, in Africa and Southeast Asia small farms with less than 2 hectares produce around 30 percent of food and make valuable contributions to micronutrient-rich food production. Ricciardi *et al.* (2018), estimated that farms under 2 hectares globally

produce 30 to 34 percent of the food supply. Yet smallholder farm households themselves are often not able to afford a nutritious diet (Xu *et al.*, 2020).

In most Sub-Saharan African families', smallholder farming is more of a livelihood survival strategy rather than an occupation. Smallholder farmers grow different crops on small pieces of land for consumption in their households and surplus may be sold to their local communities (Mothae, 2017). However, smallholder farmers still need support in decision making, adoption of new technologies, and processing. Their productivity gains should be matched by good transport and communication networks, access to markets, credit, and proper infrastructure to ensure food security and stable livelihoods.

### **2.3 Challenges facing smallholder farmers in developing countries**

The challenges faced by smallholder farmers have been the subject of several reviews and publications, however, there are limited reviews that have examined these challenges within the context of smallholder farmers' needs and aspirations (Kamara *et al.*, 2019). Eventhough it is acknowledged by different authors that smallholder farmers are seen as the developing engine in farming, Shabangu, (2017), smallholder farmers are not free from problems. According to Dou *et al.*, (2020), smallholder farmers are faced with a lot of challenges which encompass climate change, access to capital assets for sustainable and adequate food production, poor road network, storage and marketing facilities, less competitiveness and livelihoods improvements.

According to Mothae, (2017), in most Sub-Saharan countries, the key challenges of smallholder farmers accessing lucrative markets have been outlined as poor infrastructure, lack of improved farm inputs, poor information transfer, lack of knowledge, high transaction costs, poor policies and unavailability of markets. Farmers seem to have difficulties searching formal markets to sell their produce, due to inadequate access to knowledge on the market, thus resulting in high information costs (Nxumalo *et al.*, 2019). The inability of smallholder farmers to participate in high-value markets is currently a major concern in developing countries like South Africa (Mukwedeya, 2018).

According to Oluwatayo, (2019), lack of access to a reliable and lucrative formal market forced most smallholder farmers not to sell their crops, therefore restricting their crop

production to household consumption rather than marketing. When they sell their crops, they sell mainly to middlemen at low prices and make little-to-no profit. Most smallholder farmers reside in rural areas where there are no formal agricultural markets or agro-processing industries. They are compelled to market their produce to local communities in their areas, sometimes at lower prices, or to transport their products to towns at a higher cost (Baloyi, 2010).

Most smallholder farmers do not have financial and marketing skills. As a result, they cannot comply with the quality requirements developed by markets for fresh produce and food processors (Nxumalo *et al.*, 2019). Chiv *et al.*, (2020), revealed that some of the smallholder farmers are faced with challenges such as insufficient marketing price information, association or group, poor road quality to the market, cooperation, and communication with the buyer, bargaining power, access to credit, extension service, and low education.

In Lesotho, challenges facing smallholder farmers, include limited size of arable land, unfavorable farm structures (average land holding of about 1.0 hectare per family), outdated farm technologies and farm management practices, limited technical expertise, sub-optimal use of inputs, lack of an adequate irrigation and drainage system, weak rural infrastructure, a rudimentary rural advisory system, and limited access to credit (World Bank, 2019). All these constraints were identified as factors that might reduce farm profit (Chiv *et al.*, 2020).

#### **2.4 Farming systems pursued by smallholder farmers in Lesotho**

In Lesotho smallholder farmers mainly practice mixed farming which involves growing crops and rearing livestock (Finmark Trust, 2021). The majority of the agriculture sector in Lesotho consists of pastoral farming (livestock) and only about 9 percent of Lesotho's land is suitable for arable farming (growing crops) (Mafongoya and Ajayi, 2017).

Most important crops grown in Lesotho are maize, sorghum, wheat, beans and peas. Other notable crops include potatoes and vegetables and fruit (Bureau of Statistics, 2020). While vegetables and fruit are grown mostly on a subsistence scale, the country has comparative advantage in growing fruit commercially for export, especially deciduous fruit like apples and peaches (Ryan, 2018). Maize is the dominant crop grown in Lesotho, accounting for an estimated 85 percent of all arable areas being cropped (World Bank, 2019). It is estimated

that only 1 percent of the crops grown in Lesotho are grown under irrigation and the vast majority of smallholder and subsistence farming is rainfed (World Bank, 2016).

Livestock contributes 75 percent of total agricultural output, including semi-intensive and intensive production of pigs and poultry, as well as extensive (free range) production of goats and sheep on rangelands in the foothills and highland areas (World Bank, 2019). The primary livestock farmed in Lesotho are sheep (wool and meat), goats (mohair and meat) and cattle (for ploughing, milk, meat and their dung for fuel); while poultry, pigs, horses and donkeys are also farmed for food, transport and/or ploughing (*Climate-smart agriculture (CSA) considerations*, 2018; (Mafongoya and Ajayi, 2017).

Furthermore, aquaculture is a growing part of Lesotho's agriculture sector. Fish are primarily being farmed in Lesotho's Katse Dam and the main fish species being farmed is Rainbow trout (*Oncorhynchus Mykiss*) and it is eaten locally and exported, most notably to South Africa and Japan (Growth and Crea, 2022).

## **2.5 Marketing channels and Profitability**

### **2.5.1 Definition of marketing channels**

Marketing of agricultural produce plays a pivotal role in achieving food security, poverty reduction and sustainable agriculture, especially among small-scale farmers (Chiv *et al.*, 2020). Marketing channel is defined by On *et al.*, (2021), as the people, organizations and activities that need to transfer the production to gain profitability. In other words, it can be called a distribution channel. Nxumalo *et al.*, (2019), defined marketing channel as a set of interdependent organizations that help make a product available for use or consumption by the consumer or business user. Correspondingly, a marketing channel, according to Openjuru and Ph, (2019), is an organized network of agencies and institutions which in combination performs all the functions required to link producers with end customers to accomplish the marketing task.

According to Okelai *et al.*, (2020), several studies related to the market channel choice among smallholder farmers have classified the available marketing channels under different categories. (Donkor *et al.*, 2018; Kawala *et al.*, 2018), consider it as a choice between informal and formal market channels, a direct or indirect sale of various intermediaries and

users, while Benmehaia, (2019) has studied these channels through exploring the various value chain actors and structures. For the purpose of this study, there are two marketing channels mostly utilized by smallholder farmers in the study area. This includes informal markets and the formal markets.

## **2.5.2 Marketing channels used by smallholder vegetable farmers**

### **Formal marketing channels**

Formal markets are more regulated as they operate using standard weights, measures and where transactions are agreed upon based on clearly defined legal frameworks (Ferris *et al.*, 2014). These markets are characterized by modern value chain systems and can link more commercial smallholder farmers with larger commercial buyers. Farmers must comply with the stringent quality standard and regular volume requirements of formal buyers as well as be willing to accept that prices may be below those in informal markets. Hence, farmers may experience high transaction costs under such circumstances and they often fail to meet market requirements such as high quality, quantity and product specifications (Christopher, 2020).

Formal market requirements for smallholder farmers require traceability of a product and adherence to a series of best practices for the production and handling of goods due to food safety standards. Anne and Patrick (2009), stipulated that farmer must agree to lower prices in exchange for longer-term buying arrangements access to services and social investments. Equally, Ferris *et al.*, (2014), asserted that higher volumes in formal markets require a greater level of organization of smallholder farmers through collective groups, association, and cooperatives to access specific services in order to maintain quality, quantity, and consistency.

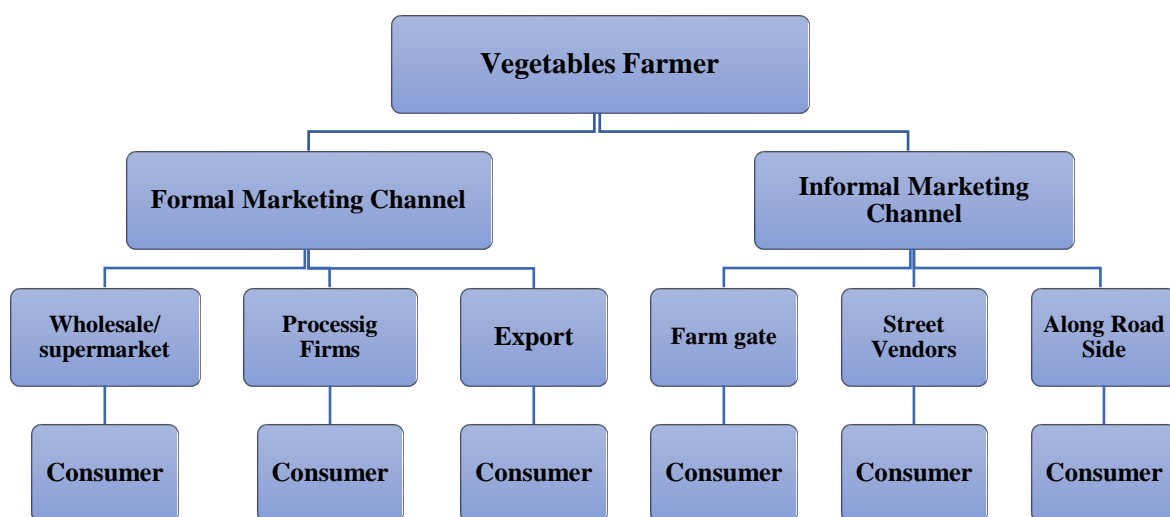
(Openjuru (2019), observed that formal markets in agriculture can be described as those governed by high quality and food safety standards, and this include supermarkets, export chains, and processing industries. For this study, the formal marketing channels used are the wholesale or supermarket, processing firms and export market.

### **Informal marketing channel**

In contrast to formal markets, informal markets provide the shortest and simplest distance between the farmer and the consumer, and as a result, it has become the most popular option, amongst smallholder farmers (Ferris *et al.*, 2014). Through this option, smallholder farmers transact directly with the ultimate consumer (Ngoro *et al.*, 2015). On-farm or direct sales to the consumer offer the greatest profit margin for the producer because all middlemen and their fees are eliminated.

Besides, an informal market is a self-sufficient section of the economy producing mainly for consumption, and it is joined with the rest of the economy through harmonizing connections (Bairagya, 2010). These markets are also characterized by having informal grades, no traceability, and a standard measure is rarely used. Prices are largely set through arbitrary combinations of supply, demand, and customer loyalties to specific sellers (Kawala *et al.*, 2018). The informal markets sell mainly to low-income consumers, thus, the current level of participation of smallholder farmers in high-value markets is unsatisfactory (Baloyi, 2010).

Furthermore, the average prices offered by supermarkets are significantly lower than informal market prices (Ferris *et al.*, 2014). The main reason for the selection of this channel is that prices are negotiated on a willing-buyer, willing-seller relationship, and convenience with no added costs like transport or commissions. For this study, the informal marketing channels used are the farm gate, street vendors and sales along the roadside.



**Figure 1: Vegetables Marketing Channel**



## 2.6 Factors influencing marketing channel choice

Marketing channels involves the integration of smallholder farmers in input and output market (Dlamini-Mazibuko, Ferrer and Ortmann, 2019). It is vital for smallholder farmers to understand the factors influencing the choice of marketing channels since it could enhance the exploitation of production possibilities, farm income and investment (Xaba and Masuku, 2012). The selection of a marketing channel is one of the most important decisions that a farmer can make and has significant effects on farm profitability (Lee, Liu and Chang, 2020), hence it is important for the smallholder farmer to produce to understand the characteristics of each channel. However, access to various marketing channels is limited by poor infrastructure, poor access to credit and marketing facilities and information (Mukarumbwa *et al.*, 2018).

When making a marketing channel choice decision, farmers are faced with several marketing channels alternatives influenced by several factors, both innate and exogeneous. Literature suggests that household characteristics, demographic variables, and socio-economic variables, as well as the exogeneous factors, ranging from existing government policies, price, and access to existing infrastructure and facilities, play a significant role in farmers decisions when selecting a marketing channel (Abdullah, 2016; Prada and Castro, 2016). Endris, Haji and Tegegne, (2020), focus on these categories regarding the factors that affect the choice of marketing channel choice which are crop characteristics, market characteristics, household and farmers characteristics, motivation, future plans, farming experience selling price and also size of land.

Meanwhile, On *et al.*, (2021), outlined the factors that affect the choice of marketing channel as distance to the market, education, farming experience, participation in other jobs, selling amount, storage facility, transport facility and access to market information. Thamthanakoon, (2018) , categorized these factors into four groups which are socio-demographic, transaction specific variables, relationship dynamics variables and other variables such as past behaviour, goals, and future plans.

In Lesotho, small-scale farmers find it difficult to participate in commercial markets due to the institutional constraints; such as poor infrastructure, lack of market transport, dearth of market information, insufficient expertise on grades and standards, inability to have

contractual agreements and poor organizational support (Rantlo, Tsoako and Muroyiwa, 2020). Hence, the study will concentrate on the following, as factors that influence marketing channel choice.

**Age** is explained in terms of the farmer's age. Old aged farmers are more likely to opt selling their produce to the nearby markets, hence age has a positive relationship with the decision to sell via informal market (Chiv *et al.*, 2020). According to Crop and Society (2020b), it is expected that old farmers have more experience, hence may decide to sell their products based on the profit of each outlet offered.

**Gender** has an impact on the market participation of female and male headed households (Mukarumbwa *et al.*, 2018). According to Crop and Society (2020b), gender is expected to affect market channel choice either positively or negatively since different gender negotiates differently in different markets.

**Education level** is measured by the formal qualification a farmer possesses. The level of education of smallholder farmers can improve production and marketing practices (Mukarumbwa *et al.*, 2018).

**Farming experience** is coded as whether a farmer has experience in farming or not. According to Wosene, Ketema and Ademe (2018), experienced farmers had better knowledge of cost and benefits associated with various pepper marketing outlets; consequently, they are more likely to decrease the quantities supplied through the district retailer market outlet and increase the quantity supplied to other lucrative market outlets.

**Access to Extension Service** farmers' access to extension services tended to increase their ability to acquire relevant market information and other agricultural information which enabled them to make an informed decision on the best market channel for their farm outputs (Negeri, 2017). Hence farmers access to extension service is expected to affect market channel choice positively.

**Labour Engaged in the Farm** is coded as either family labour or paid labour (casual or permanent). It is expected to have a positive influence on the choice of marketing channel. According to (Donkor *et al.*, 2018), large households provide cheap family labour required to

carry out the various farming operations including the transportation of the farm produce to the market.

**Distance to the market** is explained in number of kilometers travelled between the farm gate and the market area. The closer the market to the farmers dwellings, the higher the chances of farmers participation in that such market to avoid transportation and transaction costs (Rantlo, Tsoako and Muroyiwa, 2020). Distance to the market is expected to affect marketing channel choice negatively.

**Market Information Received** is expected to have an influence on the farmers marketing channel choice positively, since if farmers have access to market information, they can make more informed decisions at less costs. Rantlo, Tsoako and Muroyiwa (2020), highlighted that the access to timely, accurate and up-to-date market information is fundamental for commodity marketing in formal markets.

**Price Determination** is expected to either positively or negatively influence market channel choice. Lefebo (2016), who indicated that one of the primary drivers and factors in making decisions regarding where farmers can sell their output are price determination factors, mainly market conditions that are present in the market at the particular time.

**Time of Payment** is expected to positively affect marketing channel choice. Adu (2018) found out that there is a positive relationship between the payment period and the choice of marketing channels among farmers.

## **2.7 Empirical Review of Literature on Marketing Channels and Profitability**

### **2.7.1 Definition of Profitability**

According to Keru, (2021), profitability is the ability of a given investment to earn return from its use. The farm income, price, gross margin are the main indicators of profitability. In summary, profitability is the measure of the overall success of an enterprise.

The nature and quality of marketing channels and the agro-commodity markets used by smallholder farmers is proven to have direct impact on farm profitability. In addition, access to markets is a key determinant of smallholder farmer profitability and has the motivational effect of increasing production (Okelai *et al.*, 2020). Andres, (2013), pointed out that, profitability is dependent on a number of factors such as the degree of fairness between the farmer and the buyer, the quality of the produce and the relationship between buyer and the seller.

### **2.7.2 Effects of market channel choice on farm profitability**

The selection of the marketing channel is a fundamental decision for the producer where the objectives, factors and impact for the decision must be considered to ensure that the farmers will get the better profit (On *et al.*, 2021). In agribusiness, profitability critically depends on the choice of proper marketing channels (Zhang *et al.*, 2017), hence it is important for the farmer to choose the proper marketing channel in order to attain high profits. In addition the farmers' market channel choice could be perceived as one of the available income strategies (Zhang *et al.*, 2017).

By looking at the dynamics of farmers' profitability, by controlling several production and household characteristics, findings of the study showed that farmers' profitability was positively affected by the participation in the modern marketing channels run by the processors and contractors (Naseer *et al.*, 2019).

Profitability in agribusiness is highly dependent on the selection of appropriate marketing channels and platform (Numanovich and Abbosxonovich, 2020). The smallholder farmers will choose a marketing channel that maximizes their utility and minimizes transaction costs, using the available information (Cheelo and van der Merwe, 2021). According to Okelai, Isoh and Angundaru, (2020), the nature and quality of the marketing channels and the agro-commodity markets used by smallholder farmers is proven to have a direct effects on farm profitability. Hence access to markets is a key determinant of smallholder farmer profitability, and has the motivational effect of increasing production (Okelai *et al.*, 2020).

Farmers make two interrelated decisions, that is, decision to sell or not to sell (market participation) and to whom to sell (market channel choice). Both decisions are key

ingredients for successful marketing and determine the well-being and income to be obtained. This is so because different channels are characterized by different benefits (profitability) and costs (Gebrehiwot *et al.*, 2018).

### **2.7.3 Profitability and market channel Choice**

Various studies have been conducted on market channel choice and farm profitability. Findings of the study conducted by Naseer *et al.*, (2019) on “Effect of marketing channel choice on the profitability of citrus farmers: Evidence from Punjab-Pakistan”, revealed that farmers who were selling their produce to the processors and contractors, were better off in terms of the citrus profitability irrespective of their decisions to the specific marketing channel.

The results of the empirical study by Lee, Liu and Chang, (2020), show that wholesale markets are the most profitable marketing channel in Taiwan. Additionally, profit differentials across marketing channels are likely attributable to farm households replacing subsidized agricultural inputs for more expensive alternatives.

The data collected from a survey by Silva *et al.*, (2015), on “Impact of Marketing Channels on Perceptions of Quality of Life and Profitability for Wisconsin’s Organic Vegetable Farmers”, indicated that farmers selling to farmers markets tend to be more likely to be dissatisfied with their profitability.

## **2.8 Summary**

The chapter provided a comprehensive literature review on farmers marketing channel choice and farm profitability. The literature suggested that the marketing channel choice of smallholder farmers was influenced by a number of factors. These factors included farmers demographic factors, the institutional factors and the transactional or marketing factors. In the next chapter the description of the study area, methodology and methods employed for the determination of the effects of market channel choice on the profitability of smallholder vegetable farmers are discussed.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter is designed to explain the methodology adopted and the sources of data for the study. The main issues considered in this chapter are the geographical area where the study was conducted, research design, target population, sampling technique and size, data collection and sources, data analysis techniques including methods implemented to maintain validity and reliability of the instrument.

### **3.2 Selection of the Study Area**

#### **3.2.1 Geography**

Lesotho is located in the Southern Africa between 28° and 31° S and 27° to 30°E with a total area of 30,350 square kilometres (Nhlapo, 2017), north-south extent of about 230 kilometres and maximum width of about 210 kilometres. Altitude varies from 1500 meters to 3482 meters. Lesotho is the only country in the world that is entirely situated about 1000 meters in altitude (FAO, 2017).

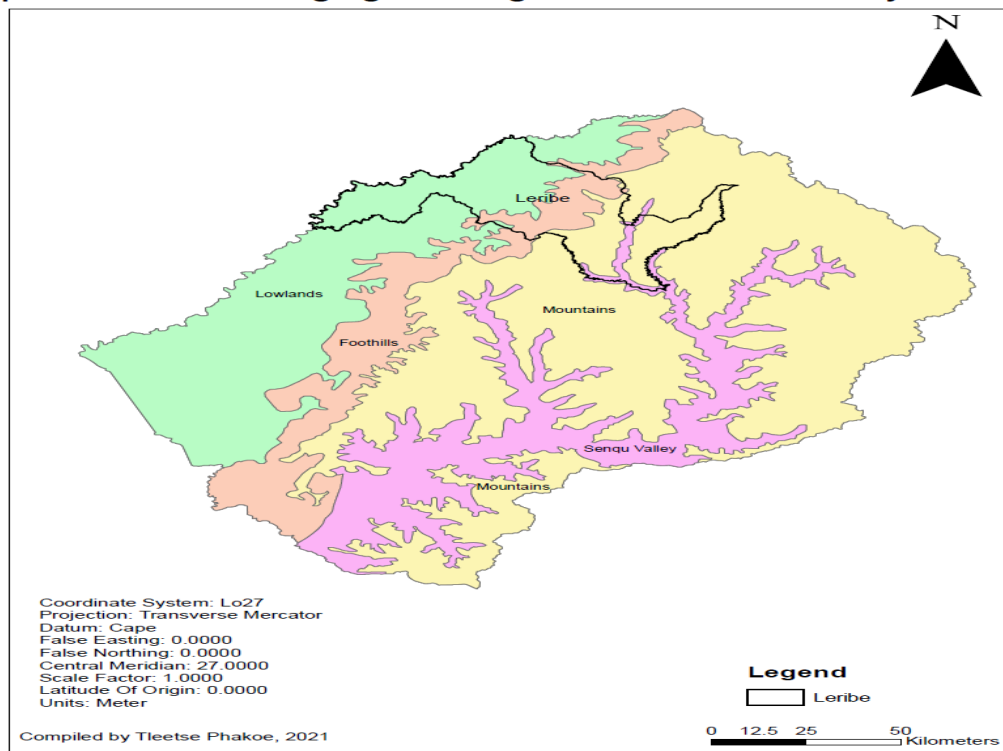
Lesotho is divided into four agro-ecological zones (Figure 2), namely, mountains (59 percent), foothills (15 percent), lowlands (17 percent) and the senqu river valley (9 percent).

Administratively, the country is divided into ten districts (Butha-Buthe, Leribe, Berea, Maseru, Mafeteng, Mohale`s hoek, Quthing, Qacha`s Nek, Thaba-Tseka and Mokhotlong)

(Prifti *et al.*, 2020). The districts are further subdivided into 80 constituencies, consisting of 129 local community councils (NSDP Lesotho, 2018).

The total land cover in Lesotho is 3,055,314 hectares. It is classified into the build-up (126,091 hectares), agricultural land (578,039 hectares), trees (38,404 hectares), shrub land (584,328 hectares), grassland (1,516,051 hectares), wetlands (32,580 hectares), water bodies and rivers (28,241 hectares) and barren land (151,581 hectares), (FAO, 2017).

**Map of Lesotho showing Agro-ecological Zones and the Study Area District**



**Figure 2: Map of Lesotho: Source MAMFS**

### 3.2.2 Climate

The climate in Lesotho is mainly temperate with the average rainfall over the country ranging between 300mm to 1300mm, (Table 1) with the northern part of the highlands recording the highest rainfall while the lowlands mean annual rainfall ranges between 650mm to 850mm (Thobei, Sutarno and Komariah, 2014). Highest rainfall occurs between October and April. Winters are dry and cold with extreme minimum temperatures of -10 °C or lower in the highlands. Summers are hot and humid, with highest maximum temperature between 16.5° C in the highlands and 30° C in the lowlands (Nhlapo, 2017).

**Table 1: Annual Rainfall and Temperatures for four Agro-ecological zones**

	Lowlands	Senqu River Valley	Foothills	Highlands
Annual Rainfall (mm)	600 - 900	450 – 600	900 -1000	1000 -1300
Temperature Range (°C)	-11 - 38	-5 to 36	-8 to 30	-8 to 30
Average Temperature (°C)	17	16	14	13

*Source: Linah Nhlapho 2017*

### 3.2.3 Population

According to the population census (2016), Lesotho has population of 2.1 million. The population has grown from 851, 591 people since independence in 1966 even though it was uneven throughout the period. The population consists of more females (51 percent) than males (49 percent) (Census, 2016). The population density is low at 66 persons per square kilometre. When expressed in terms of the arable land, the population density rises to 349.8 people per square kilometer. The majority of the population (58 percent) is concentrated in the rural areas of the country where they mostly depend on subsistence farming for survival (NSDP Lesotho, 2018).

Recurrent droughts have impacted agricultural productivity over the past years, resulting in frequent food insecurity for vulnerable households and children. The four largest districts: Maseru, Leribe, Berea and Mafeteng hold 65 percent of Lesotho’s population (Census, 2016).

### 3.2.4 Economy

Lesotho economy is dependent on sectors such as clothing and textiles, diamond extraction, water exports to South Africa and the South African Customs Union (SACU) revenue. The agricultural sector which is the main source of income for majority of rural population, only contributes 8.6% to the national Gross Domestic Products (GDP) (Lesotho country profile report, 2017). According to Table 2, in the year 2016, the manufacturing sector contributed 17% to the National Gross Domestic Products, followed by finance and business at 14.4%, and then Public Administration, education and health at 11.9%.

**Table 2: Share of Economic Activities to GDP for Selected years (% of GDP)**

ECONOMIC SECTOR	2003	2006	2011	2016
Agriculture, forestry, and fishing	6.3	7.9	5.7	5.8



Mining and quarrying	4.2	4.7	9.1	9.2
Manufacturing	22.6	21	13.3	17
Water and electricity	4.6	5.1	6.0	5.5
Construction	3.4	4.6	6.4	4.8
Trade, Hotels and restaurants	8.5	9.1	13.4	12.7
Transport and communications	4.9	6.4	6.1	6.1
Finance and business services	7.9	18.6	13.6	14.4
Public administration, education, and health	16.7	11.3	13.1	11.9
Other Services	20.9	11.4	13.4	12.3

*Source: South African Outlook (2017)*

### 3.2.5 Agriculture

In Lesotho, agriculture is an important source of income for over 70 percent of the country's population living in rural areas (World Bank, 2019). Major agricultural activities include crop production and animal husbandry (Rantšo and Seboka, 2019). However, the sector has been characterized by poor and declining yields (Mofolo and Rethabile, 2021). The vast numbers of rural community (80.4 percent) are predominantly engaged in subsistence agriculture, which employs about 38 percent of the labour force (Lesotho country profile report, 2017).

The sector is dominated by smallholder farmers and about 90 percent are small-holders and just 10 percent classified as commercial farmers (Prifti *et al.*, 2020). According to Mbago-bhunu (2020), small-holder farmers operate on less than one (1) hectare of land.

The arable land suitable for agricultural production is below 10 percent of the total land (Prifti *et al.*, 2020). The majority of socio-economic activities in Lesotho are restricted to the lowlands, the foothills and the senqu river valley, leaving the mostly barren and rugged mountain region used primarily rangelands (Banka, 2021). In 2018/2019 cropping season, the total land area used to plant major crops (maize, wheat, sorghum, beans and peas) was 63, 381 hectares (BOS, 2019), while the total land area used to plant vegetables in 2016/17 was 17,543 hectares (Horticulture Statistics Report, 2019b).

The rest of the land is composed of grassland suitable for livestock grazing. Livestock farming is very important for farmers in Lesotho, and it consists mainly of raising sheep and goats for wool and mohair production. Wool contributes about an average of 55 percent of the total agricultural exports (Prifti *et al.*, 2020). According to Mokhethi, Bahta and Ogundeji (2015), Wool and mohair are the main agricultural exports, and Lesotho is the world's second

producer of mohair after South Africa, producing 14 percent of mohair produced globally. Lesotho is second in the world in terms of production of wool and mohair (Growth and Crea, 2022).

### **3.3 Locality of the Study Area**

#### **3.3.1 Geography**

The study was conducted in Leribe district which lies in the north-eastern part of the country. The district constitutes an area of 2,828 square kilometres, between longitude 28° 53' 0" south and latitude 28° 3' 0" east (Rafoneke *et al.*, 2020). Leribe district borders with four districts namely Butha- Buthe, Berea, Mokhotlong and Thaba-Tseka. In the north, the Leribe district borders with the Butha-Bothe district, Mokhotlong district in the east and in the south with the Berea and Thaba-Tseka districts. The western part of the district is at the border with South-Africa (Muroyiwa and Ts'elisang, 2021). There are two official border posts to South Africa, namely Ficksburg bridge and Peka Bridge. The capital town of Leribe is Hlotse and it is the second largest district after Maseru (Mofolo and Rethabile, 2021).

According to the District Profile (2016), the district is divided into 13 constituencies, 13 community councils and 3 zones. In terms of agricultural administration, the district is divided into seven resource centres.

The Leribe district covers land area of 282,559 hectares (9.32%) of the country's total area of which the agricultural area covers 83,711 hectares (FAO, 2017). In terms of the topography, the district consists of the three agro-ecological zones namely lowlands which occupy 42% (below 1,800m), the foothills 28% (between 1,800m – 2,300m) and 30% of the mountain areas (above 2,300) (Muroyiwa and Ts'elisang, 2021).

#### **3.3.2 Climate**

The average altitude in Leribe is 1600mm above sea level (Morahanye, 2020). Summers are hot, and winters are brief, chilly, and dry. The warm season lasts for four months (November to March), with highs of 35°C. The monthly rainfall varies greatly depending on the prevailing season (spring, summer, autumn, and winter) and it lasts for six months. Crop farming in the study area is mainly rain fed with irrigated crop production practices by few farmers (Mofolo and Rethabile, 2021). Water scarcity is a major challenge facing farmers in the study area leading to low production levels, especially during El Nino season (Morahanye, 2020).

### **3.3.3 Population**

In 2016, Leribe district had a population of 337,500 people and the livelihood of people in Leribe district depends on agriculture because most villagers engage in crop and animal production with few people engaged in full-time formal employment (NSDP Lesotho, 2018). This population composed of very poor and poor population who represent about 49 percent of district population (Morahanye, 2020).

### **3.3.4 Agriculture**

Agriculture in Leribe district is mostly rainfed with few semi-commercial farmers practicing irrigated crop production. Farmers grow a variety of crops such as cereals (maize, sorghum and wheat), legumes (beans and peas) and a wide range of vegetable crops (rape, spinach, cabbage, green peppers, carrots, beet-root, beet-root, tomato, potatoes, radish, pumpkin, onion) and other traditional crops they develop (Mofolo and Rethabile, 2021). Production of major five crops in Leribe: (maize-4,921 metric tons, wheat-122 metric tons, sorghum-4573 metric tons, beans- 240 metric tons and peas-2 tons) (BOS, 2019). In 2017/2018 agricultural year, the total vegetable production was 68,709 metric tons (Horticulture Statistics Report, 2019b).

## **3.4 Research Design**

Syaifudin (2015) defines research design as the plan of how to go about in responding to research questions. The research design lays down the procedure on the required data, data collection method, and how this is going to answer the research questions Boru (2018).

The research design can be divided into three categories: quantitative, qualitative and mixed methods (Asenahabi, 2020). One way of classifying the design of the study is in terms of its fundamental purpose which could be descriptive, explanatory, or exploratory in nature. The descriptive study provides a picture of a situation, person or event or show how things are related to each other (Boru. 2018). Explanatory study on the other hand sets out to explain and account for descriptive information (Grey, 2014) whereas Boru (2018), highlights that exploratory study is conducted when enough is not known about a situation and a problem that has not been clearly defined. This study is based on a descriptive design and the study will adopt quantitative approach.

Syaifudin (2015), defines quantitative research as a formal, objective, systematic process to describe and test relationships and examine cause and effect interactions among variables. Surveys maybe used for descriptive, explanatory, and exploratory research. In this study a descriptive survey design was used. A survey is used to collect original data for describing a population too large to observe (Apuke, 2017). A survey obtains information from a sample of people by means of self-report, that is, the people respond to a series of questions posed by the investigator (Syaifudin , 2015). According to Asenahabi, (2020), it is a method of obtaining large amount of data, usually in a statistical form, from many people in a relatively short time using closed ended question. In this study the information was collected with copies of questionnaire which were distributed personally to the respondents by the researcher.

A descriptive survey was selected for this study mainly because it provides an accurate portrayal or account of the characteristics, for example behaviour, opinions, abilities beliefs and knowledge of a particular individual, situation or group (Pawar, 2021). This design was chosen to meet the objective of the study, which is to determine the effects of marketing channel choice on the profitability of smallholder vegetable farmers in Leribe district.

The study was conducted in Leribe district of in Lesotho covering smallholder vegetable farmers producing under tunnels. The district of Leribe is located on the northern –part of the country with high potential in crop production (NSDP Lesotho, 2018). The target population consists of smallholder vegetable farmers producing under tunnels funded by the two projects

Small-holder Agricultural Development Project (SADP) and Enhanced Integrated Framework (EIF).

According to Syaifudin (2015), a population is defined as all elements that meet the sample criteria for inclusion in the study. Trienekens (2011) defines the study population as a set of all units which possess variable characteristic under study for which findings of the research can be generalized. In this study the population consisted of two groups: smallholder vegetable farmers funded by SADP, and smallholder vegetable farmers supported by EIF. Stratified random sampling technique was used since the population was made up of two heterogenous groups, then a simple random sampling was used to draw samples from each stratum.

Data collection was done using closed-ended questionnaire. The following methods were used for data analysis:

- Primary data was processed and analyzed using major descriptive statistics (frequencies and percentages) and inferential statistics (Pearson`s Chi-square test)
- Regression analysis was run to identify factors influencing choice of vegetables marketing channel.
- Gross marginal analysis was used determine profitability of selling vegetables through each marketing channel.

### **3.5 Population and Sampling**

According to Shukla (2020), the study population refers to set of all elements on which research findings are to be applied. The study population consists of smallholder vegetable farmers from Leribe district of Lesotho producing under tunnels funded by SADP and EIF.

Ideally it is better for one to study the entire population. However, Bhardwaj (2019), highlights that due to cost, time and accessibility constraints, researchers are often forced to obtain data from smaller groups, known as sample. A sample is composed of smaller, finite number of units, extracted from a large population of interest. A sample will be drawn from the two groups that form the study population. Nanjundeswaraswamy and Divakar (2021), define a sample as the representative of the population. A sample is a subset of the target population for a research study (Syaifudin, 2015).

A stratified random sampling was used since the study population consisted of two heterogeneous groups with each group having homogenous features to form stratum. The stratified random sampling is where the population is divided into strata (sub-groups) and a random sample is taken from each sub-group (Taherdoost, 2017). In stratified random sampling, the population is divided into two sub-groups called strata on homogeneity basis, and then from each stratum, the members are selected randomly (Bhardwaj, 2019).

To ensure that each element in the population has a known and equal chance of selection, a simple random sampling was used to select samples from each stratum. According to Taherdoost (2017) simple random sampling means that all elements that form the study population have equal probability of inclusion in the sample.

In order to determine the sample size from each stratum, the following formula was adopted from (Taherdoost, 2018) and used.

Slovin`s formular (1960)

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

**n** = sample size

**N** = population size

**e** = degree of precision (95%)

### 3.5.1 Sampling

#### EIF\_ Stratum 1

$$n = \frac{24}{1 + 24(0.05^2)}$$

**n = 22**

#### SADP\_ Stratum 2

$$n = \frac{87}{1 + 87(0.05^2)}$$

**n = 71**

The formula was used due to the following two key factors; it allows the researcher to sample the population with some degree of accuracy and provides an ideas of how large is the sample size should be to ensure reasonable accuracy of the results (Mafuse, Abbysinia and Zivenge, 2021).

Data collection was done using closed-ended questionnaires. The following methods were used for data analysis:

**Objective 1:** To identify marketing channels used by smallholder vegetable farmers.

- Descriptive statistics such as frequencies and percentages, were employed.

**Objective 2:** To examine the factors influencing choice of vegetables marketing channel.

- Inferential statistics (Person`s Chi-square test) was conducted to check whether there is statistically significant association between variables, then the binary logistic regression model was run to identify factors influencing choice of vegetables marketing channel.

**Objective 3:** To determine the profitability of selling vegetables through each identified marketing channel.

- Gross marginal analysis was used to calculate the profitability of various marketing channels.

This study divided the population into two groups for the purpose of analysis. A stratified random sampling technique was used because the population was made up of two groups: smallholder vegetable farmers funded by EIF and smallholder vegetable farmers funded by SADP.

**Table 3: Study Population per Project**

<b>PROJECT</b>	<b>POPULATION</b>
EIF funded farmers (tunnels)	24
SADP funded farmers (tunnels)	87
<b>Total</b>	<b>111</b>

### **Sampling**

**EIF\_ Stratum 1**

$$n = \frac{24}{1 + 24(0.05^2)}$$

$$n = 22$$

**SADP\_ Stratum 2**

$$n = \frac{87}{1 + 87(0.05^2)}$$

$$n = 71$$

To obtain the best statistical results, the total population was used due to the small sample size. According to (Kaur, 2017), the larger the sample size, in quantitative studies, the more representative and the smaller the sampling error.

**Table 4: Sample Size**

PROJECT			POPULATION	SAMPLE SIZE	INCREASED SAMPLE SIZE
EIF (tunnels)	funded	farmers	24	22	24
SADP (tunnels)	funded	farmers	87	71	87
<b>Total</b>			<b>111</b>	<b>84</b>	<b>111</b>

### 3.6 Data Collection

According to Muhammad and Kabir (2018), data collection is a process of gathering information on variables of interest, in an orderly manner in order to answer the stated research questions, test hypothesis and evaluate outcome. The study relied on two main data sources. These sources were the primary and secondary data sources. Primary data constituted data collected using questionnaire specifically for research in response to the research problem. A personally administered questionnaire was used to ensure that all the questions were answered, and the interviewer explains the questions to ensure high reliability of data.

### 3.7 Instrumentation

Given the nature of the study, survey, a questionnaire was considered as an appropriate data collection instrument to employ. A questionnaire is a list of questions either open-ended or close-ended or both for which the respondents give answers (Muhammad and Kabir, 2018). A questionnaire assisted the researcher to gather data from respondents to make quantitative data analysis. The closed ended questionnaire was used because data is quickly coded, entered and analyzed, easier to answer and the communication skills of respondent is less critical (Hyman and Sierra, 2016). The questionnaire contained the following themes:

- Part 1: General Information



- Part 2: Demographic Characteristics
- Part 3: Farm Characteristics
- Part 4: Institutional factors
- Part 5: Transactional or Marketing factors
- Part 6: Profitability

### **3.8 Piloting of the tool**

To ensure validity and reliability of a questionnaire, the tool was pre-tested in Leribe district to a similar population (EIF and SADP) funded projects but were not included in the study.

### **3.9 Validity and Reliability**

#### **Validity**

Mohajan (2017), defines validity as the extent to which an instrument measures what it is designed to measure, that is, it measures the degree to which the results are truthful. It refers to an extent to which a concept is accurately measured in a quantitative study (Heale and Twycross, 2015). Validity has two essential parts; internal (credibility) validity and the external (transferability) validity. (Mohajan, 2017) (Moses and Yamat, 2021). Validity test is divided into four types (Moses and Yamat, 2021); content validity, face validity, construct validity, and criterion-related validity. The pilot study used the content validity and face validity to validate the instrument.

Sürücü and Maslakçi (2020), defined content validity as a qualitative form of validity that evaluates whether the expressions contained in the measuring instrument represent the phenomenon intended to be measured. It is highly recommended to apply content validity while the new instrument is being developed Taherdoost (2016).

Face validity is a subjective decision based on the researcher's feelings, thoughts, and intuition about the functioning of the measuring instrument (Sürücü and Maslakçi, 2020). For this study, face validity was done by referring to the supervisor. Rephrasing of some questions was done to clarify questions that were found not clear and more appropriate

choices were added to the closed ended questions to provide a more meaningful data for analysis.

## **Reliability**

To test reliability, the tool was pre –tested in Leribe district with farmers who were not part of the targeted population but are in the same study area. These farmers were not included in the study. Kubai (2019) refers to reliability as the degree of consistency with which an instrument measures the attributes it is designed to measure, under different condition, supposedly with alternative instruments which measure the construct or skill. This implies that accurate instruments can be used many times in multiple timelines and show explicit and consistent results (Moses and Yamat, 2021). In quantitative research, reliability refers to the consistency, stability and repeatability of results, that is, the result of a researcher is considered reliable if consistent results have been obtained in identical situations but different circumstances (Mohajan, 2017).

Reliability testing measures include test-retest, equivalent form, internal consistency, and reliability statistics (Moses and Yamat, 2021). Among these, the most frequently applied methods are test-retest reliability, alternative forms, and internal consistency tests (Sürücü and Maslakçi, 2020). In this pilot study reliability statistics were used. Cronbach's Alpha was used to calculate the consistency of the instrument. According to Heale and Twycross (2015) the Cronbach's Alpha result, is a number between 0 and 1, and the acceptable reliability score is one that is 0.7 and higher.

The instrument was then distributed and completed by the pilot group. Face to face interviews were made to ensure that farmers fully understand the questions. During the interview session, the famers were encouraged to express their thoughts and ideas freely in a relaxed manner. Finally, the data was gathered and analysed using the Statistical Package Social Science (SPSS). The reliability of the data was measured and reported using Cronbach's alpha formula after analysis using the SPSS.

### **3.10 Ethical Considerations**

According to Syaifudin (2015), ethics in business research considers the way in which a research topic has been formulated and clarified, data collection procedure, data processing and storage and how the data is presented and analysed. Fleming and Zegwaard (2018), indicated the selection of an appropriate research methodology and methods as one importance of the ethical considerations in conducting the research. Some ethical dilemmas commonly encountered as an ‘insider researcher’, including the power differential and ongoing relationships with participants (Fleming and Zegwaard, 2018). It is also important to further consider the fundamentals of ethical research involving human participants.

The researcher need to consider the ethical issues as an attempt to protect and respect the respondents’ privacy, minimize harm, and promote goodness (Abrar and Sidik, 2019). Fleming and Zegwaard (2018) highlights the following ethical expectations, informed consent, risk of harm, anonymity and confidentiality, and conflict of interest.

Lastly the respondents were informed about the study to ensure full participation and the right to privacy was ensured by keeping the information provided by the respondents as confidential as possible.

### **3.11 Data Analysis**

Primary data was collected using closed ended questionnaire and it was analysed and presented in a manner that makes sense to users of such information. For data analysis, a computer programme called Statistical Package for Social Sciences (SPSS) and Microsoft excel were used. The rational for data analysis was to enable the researcher to make conclusions and meaningful recommendation based on the study. Descriptive statistics (frequencies and percentages) were used to examine the available marketing channels. According to Yellapu, Vikas (2018), descriptive statistics are used to summarize data in an organized manner by describing the relationship between variables in a sample or population. Descriptive statistics describes the data in a quantifiable manner such as in measures of centre (mean, median, mode) which capture general trends in the data; and measures of spread (range, variance, standard deviation) which describes the distribution of the data values throughout the population in relation to each other (Allanson and Notar, 2020). Each of the

objectives was analyzed with the use of each of the techniques of data analysis explained below:

**Objective 1:** To identify marketing channels used by smallholder vegetable farmers.

- Descriptive statistics such as frequencies and percentages were employed.

**Objective 2:** To examine the factors influencing choice of vegetables marketing channel.

- Inferential statistics (Person`s Chi-square test) was conducted to check whether there is statistically significant association between variables, then the binary logistic regression model was run to identify factors influencing choice of vegetables marketing channel
- Binary logistic regression model was run to identify factors influencing choice of vegetables marketing channel.

**Objective 3:** To determine the profitability of selling vegetables through each identified marketing channel.

- Gross marginal analysis was used to determine the profitability of various marketing channels.

### **3.12 Model Specification**

Main actors in vegetable market in Leribe district are wholesalers, supermarkets, fruits and vegetable stores, hotels and restaurants, schools, and hospitals. All these channels are classified under formal market channel. According to Ssekibaala (2019), formal markets in agriculture can be described as those governed by high quality and food safety standards, and where activities are monitored (within supermarkets, export chains and processing industry). Other vegetable market channels include farm gate sales, street vendors, sales along the roadside and they are classified under the informal market channel. Nyaga, Nyikal and Busienei, (2016) highlights that, the informal market as those that involve unofficial transactions between farmers and traders and consumers.

- Descriptive statistics (frequencies and percentages) were used to describe the identified marketing channels used by smallholder vegetable farmers.
- Gross marginal analysis was used to determine the profitability of selling vegetables at each marketing channel.

$$GM = Y - \sum p x_i X_1$$

Where: GM= Gross Margin

Y= Vegetables Sales (total revenue)

$\sum p x_i X_1$ = Total Cost of Production (total variable costs)

According to Nkadimeng *et al.*, (2021), gross marginal analysis is a model used to estimate financial returns to a production process. It is used in comparing the performance of enterprises that have similar requirements for capital and labour (Kemboi, Muendo and Kiprotich, 2020). Gross margin is the difference between total revenue and variable costs (Enerlan and Bulayog, 2021), specified as:

$$\text{gross margin} = \text{total revenue} - \text{total variable cost}$$

- Inferential statistics (Person`s Chi-square test) was conducted to check whether there is statistically significant association between variables. It evaluates if some categorical variables are correlated with some populations, because variables tend to be a bit different from their populations (Nihan, 2020). The binary logistic regression model was run to identify factors influencing choice of vegetables marketing channel.
- Binary logistic regression model was used to assess the determinants of marketing channel choice. The Logistic regression model was used for the empirical analysis because the probability of farmers is assumed to be a binary choice. According Rantlo, Tsoako and Muroyiwa (2020), logistic regression model is used because it has the ability to determine the effect of explanatory variables on the probability of the dependent variable and produces the highest predictive accuracy possible with a given set of predictors.

A binary logistic regression model will be in this form:

$$Y = \ln(p/1-p) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + E_t$$

The formula for estimating the probability is:

$$p = \frac{\exp(Y^*)}{\exp(Y^*) + 1}$$

$$\text{Marketing channel Choice (Y)} = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{Education level} + \beta_4 \text{Farming Experience} + \beta_5 \text{Access to Extension Service} + \beta_6 \text{labour engaged in the farm} + \beta_7 \text{Distance to Market} + \beta_8 \text{Market Information Received} + \beta_9 \text{Price Determination} + \beta_{10} \text{Time of Payment} + E_t$$

**Y** = Marketing Channel Choice

Marketing Channel Choice: 1 for formal marketing channel  
0 for informal marketing channel

$\beta_0$  = Intercept term

$\beta_1, \beta_2, \beta_3, \dots, \beta_{10}$  = Unknown parameters to be estimated

**X**= Independent Variables

$E_t = \text{Error}$  term (takes care of variables not stated in the model)

**Table 5: Description of variables that influence the choice of vegetable marketing channel**

Variable	Description	Variable Labels	Coding of Variables	Category	Expected signs
<b>Dependent Variable</b>					
Market Channel Choice: 1 for formal marketing channel 0 for informal marketing channel					
<b>Independent Variables</b>					
<b>X<sub>1</sub></b>	Age	Age	Number of years	Continuous	+/-
<b>X<sub>2</sub></b>	Gender	G	1 if female 0 if male	Dummy	+/-
<b>X<sub>3</sub></b>	Level of education	Ednlevl	1 if literate, 0 if illiterate	Dummy	+
<b>X<sub>4</sub></b>	Farming experience	FarExp	1 if yes 0 if no	Dummy	+
<b>X<sub>5</sub></b>	Access to Extension Service	ExtSer	1 if yes 0 if no	Dummy	+
<b>X<sub>6</sub></b>	Labour Engaged in the farm	LbrEng	1 if family labour, 0 if otherwise	Dummy	+

<b>X<sub>7</sub></b>	Distance to market	DistMkt	Number of kilometers	Continuous	-
<b>X<sub>8</sub></b>	Market information Received	MktInfo	1 if Received 0 otherwise	Dummy	+
<b>X<sub>9</sub></b>	Price Determination	PrDer	1 if market conditions 0 Otherwise	Dummy	+/-
<b>X<sub>10</sub></b>	Time of Payment	TimPay	1 if on delivery 0 otherwise	Dummy	+/-

### Description of the dependent Variables

The dependent variable denotes two marketing channel choices that smallholder farmers sell their produce. The first is the formal market channel which comprises of wholesalers, supermarkets, export, and processing forms. The second marketing channel is the informal market channel consisting of farm gate sales, street vendors, sales along the roadside. For formal marketing channel choice, the variable will take the value of 1 and 0 otherwise.

### Description of the independent Variables

The independent variables that determine the marketing channel choice were of smallholder vegetable farmers adopted from the literature are shown in table 4 above.

**Age** is explained in terms of the farmer's age. Old aged farmers are more likely to opt for selling their produce to the nearby markets, hence age has a positive relationship with the decision to sell via informal market (Chiv *et al.*, 2020). According to Crop and Society (2020b), it is expected that older farmers have more experience, hence may decide to sell their products based on the profit of each outlet offered.

**Gender** has an impact on the market participation of female and male headed households (Mukarumbwa *et al.*, 2018). According to Crop and Society (2020b), gender is expected to affect market channel choice either positively or negatively since different gender negotiates differently in different markets.

**Education level** is measured by the formal qualification a farmer possesses. The level of education of smallholder farmers can improve production and marketing practices (Mukarumbwa *et al.*, 2018).

**Farming experience** is coded as whether a farmer has experience in farming or not. According to Wosene, Ketema and Ademe (2018), experienced farmers had better knowledge of cost and benefits associated with various pepper marketing outlets; consequently, they are more likely to decrease the quantities supplied through the district retailer market outlet and increase the quantity supplied to other lucrative market outlets.

**Access to Extension Service** farmers' access to extension services tended to increase their ability to acquire relevant market information and other agricultural information which enabled them to make an informed decision on the best market channel for their farm outputs (Abera Negeri, 2017). Hence farmers access to extension service is expected to affect market channel choice positively.

**Labour Engaged in the Farm** is coded as either family labour or paid labour (casual or permanent). It is expected to have a positive influence on the choice of marketing channel. According to Donkor *et al.*, (2018), large households provide cheap family labour required to carry out the various farming operations including the transportation of the farm produce to the market.

**Distance to the market** is explained in number of kilometers travelled between the farm gate and the market area. The closer the market to the farmers dwellings, the higher the chances of farmers participation in that such market to avoid transportation and transaction costs (Rantlo, Tsoako and Muroyiwa, 2020). Distance to the market is expected to affect marketing channel choice negatively.

**Market Information Received** is expected to have an influence on the farmers marketing channel choice positively, since if farmers have access to market information, they can make more informed decisions at less costs. Rantlo, Tsoako and Muroyiwa (2020), highlighted that the access to timely, accurate and up-to-date market information is fundamental for commodity marketing in formal markets.



**Price Determination** is expected to either positively or negatively influence market channel choice. Lefebo (2016), who indicated that one of the primary drivers and factors in making decisions regarding where farmers can sell their output are price determination factors, mainly market conditions that are present in the market at the particular time.

**Time of Payment** is expected to positively affect marketing channel choice. Adu (2018) found out that there is a relationship positive between the payment period and the choice of marketing channels among farmers.

### **3.13 Model Justification**

To assess the determinants of marketing channel choice of smallholder vegetable farmers, a binary logistic regression model was used. The model was chosen since the dependent variable is dichotomous in nature (Paenda *et al.*, 2020). According to Abdulqader (2017), binary logistic regression analysis examines the relationship between multiple explanatory variables and a single binary response variable, a categorical variable with two categories. The model has been widely used in several fields including social sciences when investigating dichotomous response, (Raleting and Obi, 2015). In this study, it is assumed that smallholder vegetable farmers are faced with two marketing channel choices: formal marketing channel and the informal marketing channel.

### **3.14 Summary**

The purpose of the chapter was to highlight the methodological approach that was used to achieve the research objectives. A quantitative approach was adopted, and a descriptive survey was used. A closed ended questionnaire was administered through face to face and telephone interviews. The stratified simple random sampling technique was used to select a sample and data was processed and analysed using Statistical Package for Social Science (SPSS) and Microsoft Excel. In the next chapter results from the study are presented, analysed, and discussed.

## **CHAPTER FOUR: RESULTS AND DISCUSSION**

### **4.1 Introduction**

The aim of this chapter is to present the results of the survey undertaken for this study in Leribe district. The data under analysis was collected from 111 smallholder vegetable farmers producing under tunnels. The chapter commences with brief descriptive analysis of the sample in the study. Then, the inferential analysis of the factors influencing farmers' choice of the marketing channel is outlined. The next section provides the results on the effect of marketing channel choices on the profitability of smallholder farmers.

### **4.2 Descriptive Analysis of the Sample**

In this section, descriptive statistics such as frequencies, percentages, maximum, and mean were used as statistical indicators for the preliminary data analysis and for describing the sample.

#### **4.2.1 Socio-Economic Characteristics of Smallholder Vegetable Farmers**

In this section, the socio-economic characteristics of smallholder vegetable farmers are discussed. According to Mazibuko (2019), the socio-economic characteristics are important because the key household activities are coordinated by the household's head, and the heads decisions are most likely to be influenced by such demographic characteristics.

Table 6 shows the gender distribution of smallholder vegetable farmers in Leribe district. The results revealed that female respondents accounted for about 51% while male accounted for about 49%. This implies that vegetable farming in the study area is dominated by females. According to Rantlo, Tsoako and Muroyiwa, (2020), reasons behind this could be that women are forced to supervise the activities as men go to business districts to look for jobs. The respondents had several alternative sources of income and the results in Table 6 showed that the respondents' main source of income was from vegetable production at 36.04%, followed by other farming practices at 22.52%, off-farm employment at 19.82%, other alternative sources at 18.02% and pension at 3.60 %. The implication from the results of the study is that most of the respondents were engaged in agriculture as the main source of income. The findings are in line with Sekoai and Rantlo (2016), who also found out that most population in Lesotho is dependent on agriculture for livelihood purposes. The main occupation of the respondents was classified as being a farmer, civil servant, unemployed,

private sector, self-employed and other sectors. The results in Table 6 indicate that 44.95% of the respondents were farmers, while 18.02 % of the respondents were self-employed, 15.32% were civil servants, while 10.81% were engaged in other sectors. The results further indicate that 7.21% of the respondents were unemployed while farmers engaged in private sector constituted a small proportion of 2.70%. These imply that the main occupation of the respondent in the study area is farming, either crops or livestock. According to Muroyiwa *et al.*, (2020), Lesotho is mainly a rural economy, with over 70 percent of rural population dependent on agriculture and other activities for livelihood purposes, hence the implication of the results.

**Table 6: Results on Gender, Main Source of Income, and Main Occupation**

<b>Variables</b>	<b>Percentage %</b>
<b>Gender</b>	
Female	50.46
Male	49.54
<b>Total</b>	<b>100%</b>
<b>Main Source of Income</b>	
Vegetable Production	36.04
Other farming Practices	22.52
Off farm employment	19.82
Pension	3.60
Other	18.02
<b>Total</b>	<b>100%</b>
<b>Main Occupation</b>	
Farmer	45.95
Civil Servant	15.32
Unemployed	7.21
Private Sector	2.70
Self employed	18.02
Other	10.81
<b>Total</b>	<b>100%</b>

#### 4.2.2 Farm size and Land Tenure System

The farm size in the study area ranges between less than one acre to 5 acres. Results in Table 7 indicated that majority (69.37%) of the respondents in the study area farmed on the area less than 1 acre. Farmers with area between 1.1 acres and 2.0 acres accounted for 16.22%, between 2.1 areas and 3 areas constituted 8.11%, between 3.1 acres and 4.0 acres occupy 2.70%. Farmers with land size area 4.1 acres and 5.0 acres, and 5.1 acres and above occupy 1.80% each respectively. The implication of the results is that most farmers in the study area were smallholder famers with area less than 1 acre. In Lesotho, the average land holding per family is about 1.0 hectare per family (World Bank, 2019).

Table 7 further illustrates that the land tenure system in the study area was such that, majority (68.47%) of the land was privately owned, 20.72% leased, 6.31% was for other land use, and 4.50% communally owned. The implication of the results is that most farmers in the study area own land privately, which can be used as a collateral in order for smallholder farmers to acquire loans, to improve their production to be able to access lucrative formal market channels. The literature suggests that in Lesotho the land is inherited, Sedán *et al.*, (2020), hence most of the respondents privately owned the land. According to Nkadimeng *et al.*, (2021), the type of land ownership system has influence on agricultural development and the type of investment.

**Table 7: Results of the Farm size and Land Tenure System**

<b>Farm Size</b>		
<b>Size of the farm in acres</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Less than 1 acre	75	69.37
Between 1.1 and 2.0 acres	18	16.22
Between 2.1 and 3.0 acres	9	8.11
Between 3.1 and 4.0 acres	3	2.70
Between 4.1 and 5.0 acres	2	1.80
Above 5.1 acres	2	1.80
<b>Total</b>	<b>109</b>	<b>100%</b>
<b>Land Tenure System</b>		
Communal	5	4.50
Leased	23	20.72
Private Owned	74	68.47
Others	7	6.31
<b>Total</b>	<b>109</b>	<b>100%</b>

### 4.2.3 Age and Farming Experience

Table 8 shows the results of farmers age and their farming experience. The minimum age of the respondent was less than thirty years, with the maximum farmers age above 61 years. A relatively high proportion of the respondents (36.04%) were aged between 31 and 40 years, 27.03% aged between 41 and 50 years, and 15.32% aged between 51 and 60 years. Older farmers aged above 61 years accounted for 12.61% while youngest farmers aged less than 30 years accounted for 9.01% of the respondent population. The results imply that most of the respondents in the study area were relatively young and were within the economically active population, exposed to new technologies and innovations, hence can choose marketing channels that yield better returns. The literature explained that younger farmers are more receptive to new ideas and risk-takers compared to older farmers who are less innovative and risk-averse (Siddique, 2015).

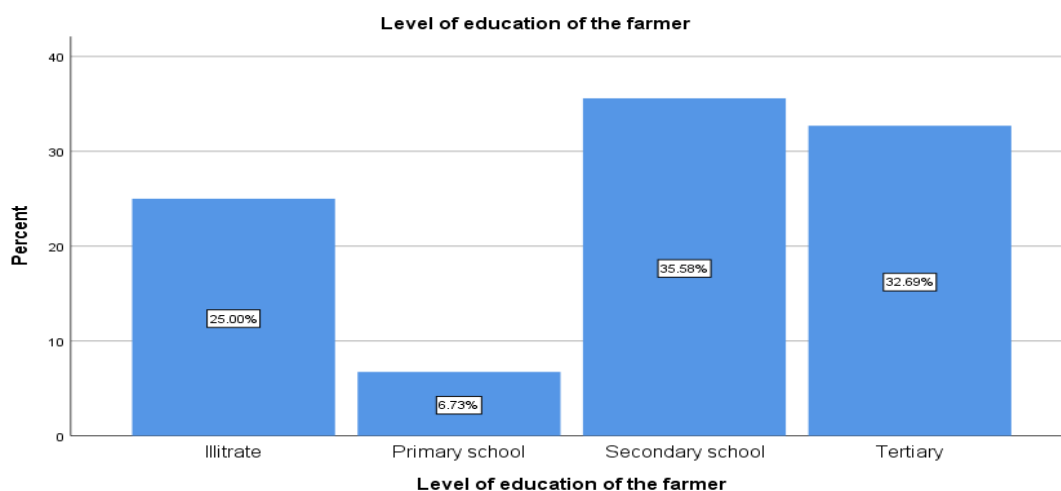
The results in Table 8 further revealed that most farmers (95.41%) had experience in vegetable production and marketing, while a little proportion 4.59% had no farming experience in either production or marketing. Sedán *et al.*, (2020) stated that, marketing experience helps in building social networks, which in turn aids in reduction of transaction costs associated with searching for the market. Production experience on the other hand helps in attaining production efficiency. Farming experience could improve market participation of smallholder vegetable farmers, and this implies that most farmers are experienced and can choose market channels that bring higher returns.

**Table 8: Results on Age and Farming Experience**

Variables	Frequency	Percentage
<b>Age</b>		
Less than 30 years	10	9.01%
Between 31 and 40 years	39	36.04%
Between 41 and 50 years	29	27.03%
Between 51 and 60 years	17	15.32%
Above 61 years	14	12.61%
<b>Total</b>	<b>109</b>	<b>100%</b>
<b>Farming Experience</b>		
Yes	104	95.41%
No	5	4.59%
<b>Total</b>	<b>109</b>	<b>100%</b>

#### 4.2.4 Educational Level

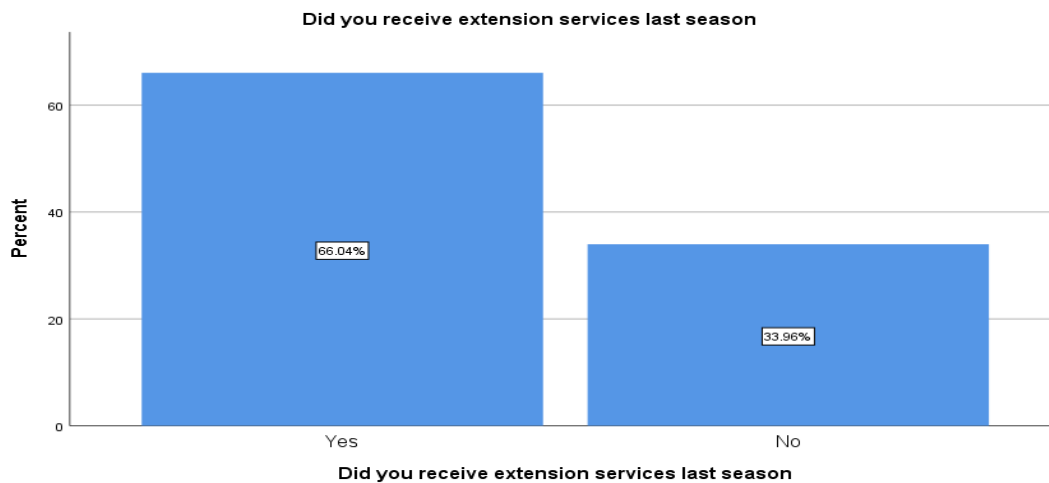
The results on level of education of the respondents as per Figure 3, showed that about 35.58% of farmers in the study area acquired secondary school education, followed by tertiary education at 32.69%, whereas 25% of the respondents were illiterate, and only 6.73% attained primary level education. The implication of the results is that smallholder farmers in the study area are literate, hence more likely to adopt marketing channels with better returns. According to Kiprop *et al.*, (2020), education level of the household head were significant determinants of farmers’ choice of market channel.



**Figure 3: Education Level**

#### 4.2.5 Access to Extension Service

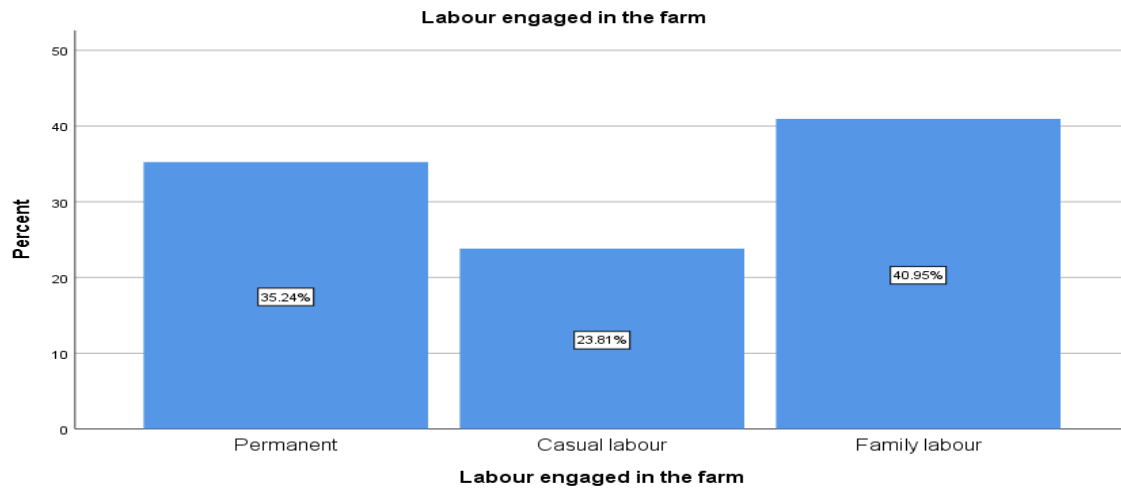
The result in Figure 4 showed that the majority (66.04%) of the farmers had access to extension services. About thirty four percent (33.96%) of the farmers indicated that they did not have access to extension services during recent cropping seasons. The implication of the results is that most farmers in the study area received extension service related to vegetable production and marketing hence, potential to participate and choose the most profitable marketing channel. Farmers' access to extension services tended to increase their ability to acquire relevant market information and other agricultural information which enabled them to make an informed decision on the best market channel for their farm outputs (Negeri, 2017).



**Figure 4: Access to Extension Service**

#### 4.2.6 Labour Engaged in the Farm

Figure 5 illustrates the type of labour engaged in the respondents' farms. Labour was divided into three categories: permanent, casual, and family labour. Some respondents used family labour (40.95%), followed by permanent labour at 35.24% and lastly casual labour at 23.81%. The implication of the results is that the study area is dominated by farmers who are resource poor and forced to use other family members such as their parents in vegetable production to reduce production costs. According to Mukarumbwa *et al.*, (2018), availability of adequate family labour is expected to boost productivity and increase marketable surplus.

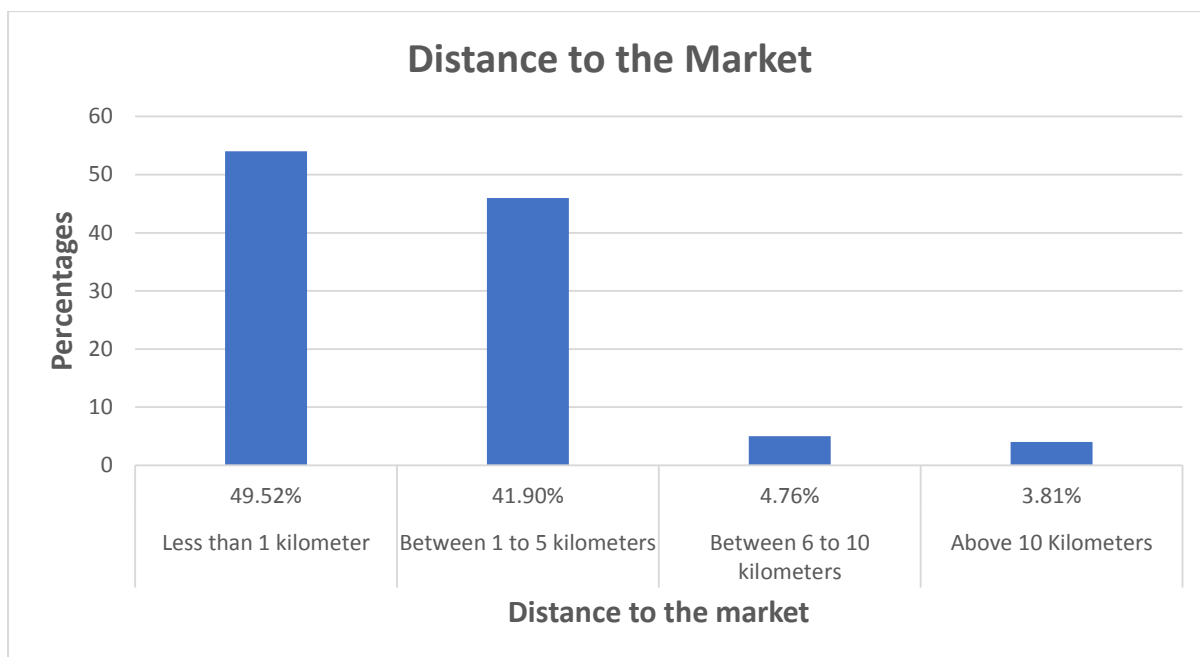


**Figure 5: Labour Engaged in the Farm**

#### 4.2.7 Distance to the Market

Figure 6 shows the distance travelled to the nearest market. Distance travelled is classified into four categories (less than 1 kilometer, between 1 and 5 kilometers, between 6 and 10 kilometers and above 10 kilometers). The results revealed that some respondents (49.52%) travelled less than 1 kilometer to reach the market, 41.9% travelled between 1 and 5 kilometers, 4.76% travelled between 6 and 10 kilometers while 3.81% of the respondents travelled distance above 10 kilometers. The results imply that farmers travel short distances to the markets hence, low transport related costs. The probable explanation is that farmers use informal markets that are found even in their villages. The distance of the farming household to the nearest market has been identified by some researchers to precipitate a significant influence on the choice of marketing channel. Mmbando, Wale and Baiyegunhi (2017), explained that the longer the market distance implied that farmers needed to incur high transport costs to convey the farm output to the market. Such high transaction costs discouraged farmers from using channels in the market, but they would rather choose to sell at farm gate channels.

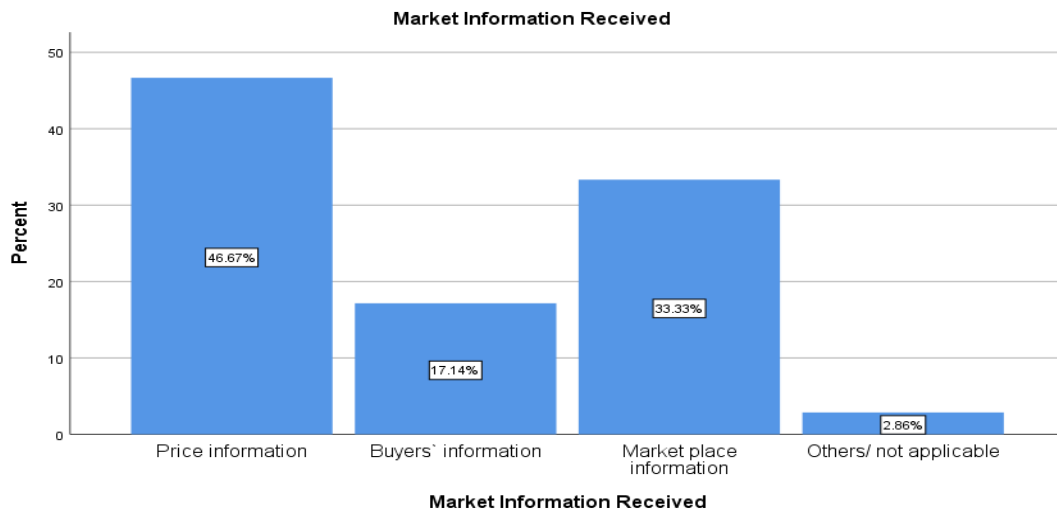




**Figure 6: Distance to the Market**

#### **4.2.8 Market Information Received**

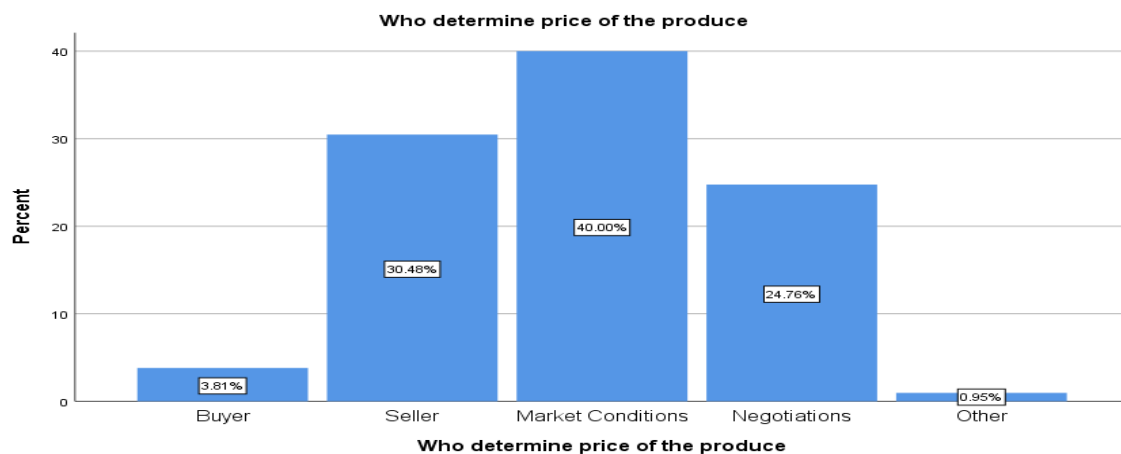
According to the study, market information received is categorized into price information, buyer's information, marketplace information and other useful information. Figure 7 shows that the type of market information received by the farmers in the study area is mainly price information (46.67%), followed by marketplace information (33.33%), buyers' information (17.14%) and then other useful information (2.89%). The implication of this results is that smallholder famers in the study area are relatively least aware about buyers' requirements and conditions as they received little information in that regard. According to Mzyece (2016), farmers with little information about buyers requirements and conditions participate less in lucrative output markets.



**Figure 7: Market Information Received**

#### 4.2.9 Price Determination

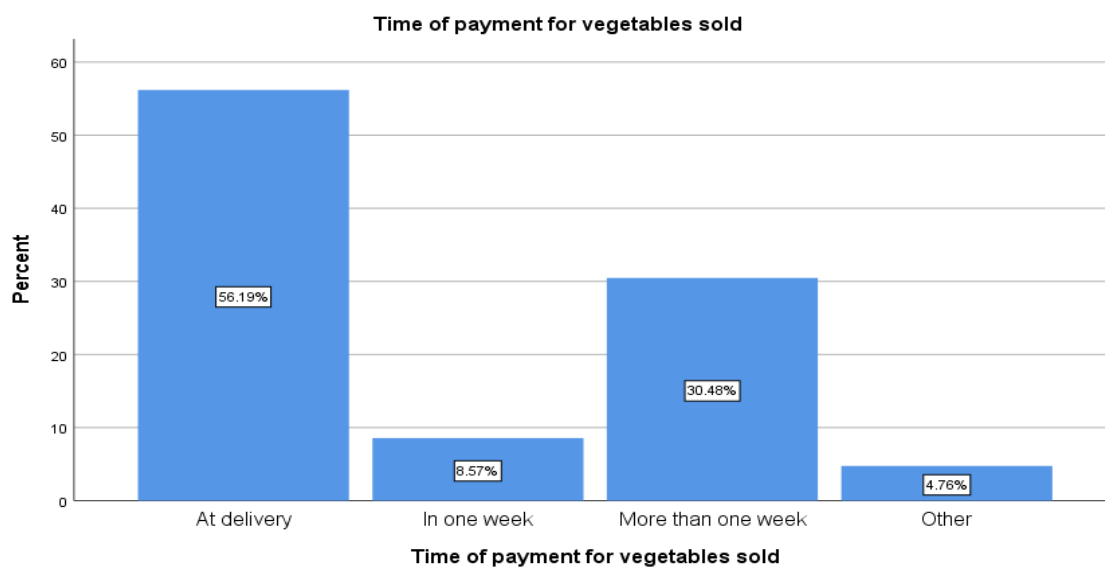
The study has categorized the price determination into five categories; buyer, seller, market condition, negotiations and other factors as the ones that determine the price of the produce. The price of the farm product is considered as one of the key elements that influences farmers' choice of marketing channel. Figure 8 shows that the price of the commodities was 40% determined by the market conditions, 30.48% determined by the seller, negotiations accounted for 24.76% while the influence on the price by the buyers accounted for only 3.81%, while other factors that determine the price of the produce accounted 0.95%. It can be observed that market price is mainly determined by market conditions, and this implies that there is fairness in pricing in the study area.



**Figure 8: Price Determination**

#### 4.2.10 Payment Time

Figure 9 illustrates time of payment for vegetables sold. The categories for payment time include payment at delivery, payment within a week after delivery, more than a week and others. Majority, 56.19%, of the respondents' produce were paid on delivery to the market. It took more than one week for 30.48% of the respondents to get payment for their produce, and a weeks' time for 8.57% of the respondents to be paid and 4.76% for other payment periods. The results imply that farmers are mostly paid within short time and do not have to deal with undesirable consequences of delayed payments including transaction costs associated with frequent follow up.



**Figure 9: Payment Time**

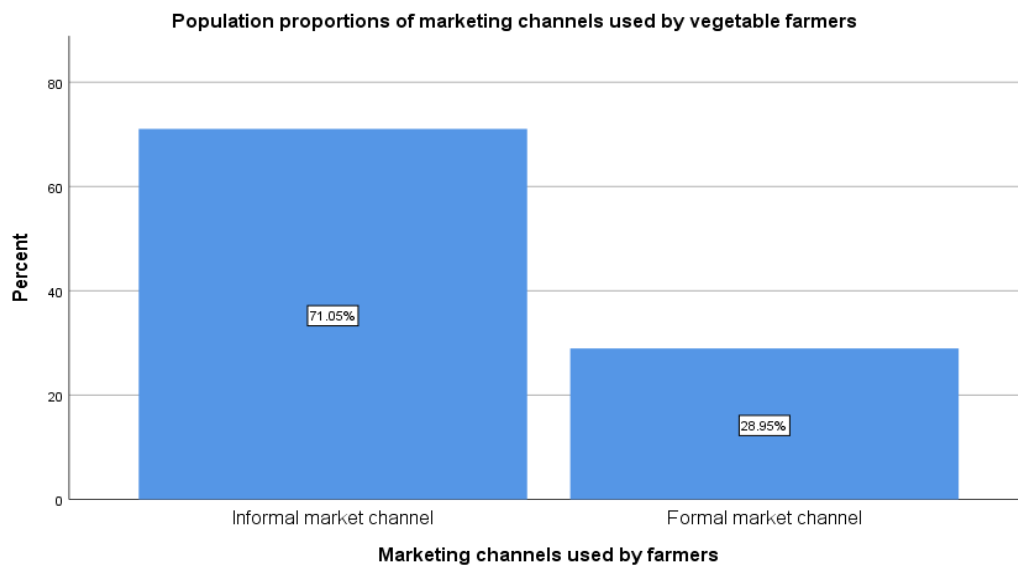
#### Dependent Variable

The dependent variable for this study was the marketing channels available to smallholder vegetable famers in Leribe district.

#### 4.3 Marketing Channels used by smallholder vegetable farmers

The current study focused on marketing channels used by smallholder vegetable farmers. The study identified the two main marketing channels used by smallholder vegetable farmers, and they included formal marketing channel (wholesale/supermarket, processing firm and export), and the informal marketing channel (farm gate, street vendors and sale along roadside), as shown in figure 10 below. According to the results, a majority, 71.05%, of the vegetable farmers used informal marketing channels whereas a minority, 28.95%, of the

vegetable farmers used a formal marketing channel. The reason behind this could be that most vegetable farmers in Leribe district are smallholder farmers who are resource poor and are faced with challenges such as poor road network, lack of marketing information, marketing, and production challenges. Therefore, they opt for informal marketing channel that are easily accessible with less transaction costs.



**Figure 10: Marketing Channels used by Smallholder Vegetable Farmers**

Table 9 shows the distribution of marketing channels used by smallholder vegetable farmers. The results showed that within the formal marketing channel all farmers (31) sold their vegetables to the wholesale or supermarket. In the informal marketing channel, 34 sold vegetables at the farm gate, 31 to street vendors while only 5 of the famers sold vegetables along the roadside. The results suggest that farm gate is the main channel used by farmers, which is informal marketing channel. This could be due low transaction costs associated with the farm gate sales.

**Table 9: Marketing Channels used by Smallholder Vegetable Farmers**

Marketing Channel	Frequency	Percentage (%)
<b>Formal</b>		
Wholesale/supermarkets	31	30,7
Processing firms	0	0,0
Export	0	0,0
<b>Informal</b>		
Farm gate	34	33,7
Street vendors	31	30,7
Along roadside	5	5,0
<b>Total</b>	<b>101</b>	<b>100,0</b>

#### 4.4 Factors Influencing the Choice of Marketing Channel

To determine the factors influencing the choice of vegetable marketing channel among smallholder vegetables farmers, a chi-square test of independence was used. It evaluates if some categorical variables are correlated with some populations, because variables tend to be a bit different from their populations (Nihan, 2020). This indicates whether there is statistically significant association between variables. The binary logistic regression model was fitted with significant variables identify the factors influencing the choice of marketing channels for smallholder vegetable farmers.

**Table 10: Chi-Square Test Results for Age**

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.766 <sup>a</sup>	1	.381		

The Pearson chi-square p-value (0.381) was not statistically significant at 5%. Therefore, the evidence suggests that there is no association between marketing channel choice and the age of vegetable farmers in the study area. Chirwa (2014) also found that there was no significant relationship between farmers' age and their choices of marketing channels in Ethiopia. This finding implied that the age of farmers did not affect their marketing decision, even their choice of the marketing channel.

**Table 11: Chi-Square Tests Results for Gender**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.125 <sup>a</sup>	1	.008		

The Pearson chi-square p-value is 0.008 at a significance value of 5%. Therefore, the evidence strongly suggests that marketing channel choice and gender among vegetable farmers are dependent. This suggests that there was an association between farmers' choice of marketing channels and their gender. That is, farmers' gender tended to affect their decision to participate in either formal or informal marketing channel. The findings of this study are in line with Walpole and Myers (2012) who articulated that gender of the farmer was an important determinant of market channel choice between consumers and traders.

**Table 12: Chi-Square Tests Results for Education Level**

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.747 <sup>a</sup>	1	.053		

The Pearson chi-square p-value was 0.053 at a significance level of 5% meaning that the marketing channel and level of education among vegetable farmers are independent. This means that there was no association between farmers' choice of the marketing channel and their educational level. The result was not expected seeing that most of the farmers in the study area acquired a formal education. The possible reason can be that smallholder farmers in the study area have access to extension service, which helps on production and marketing skills. Hence, there was no association between level of education and the choice of marketing channel. Some empirical studies also showed that education exerted no effect on farmers' choice of marketing channels in areas where relevant extension services were quite accessible for all (Zivenge, 2012; Donkor *et al.*, 2018).

**Table 13: Chi-Square Tests Results for Farming Experience**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.041 <sup>a</sup>	1	.840		

The Pearson chi-square p-value is 0.84 was not statistically significant at 5%, suggesting that choice of marketing channel and farming experience among vegetable farmers are independent. This indicated that there was no association between farmers' choice of marketing channel and their experience in vegetable production and marketing. The probable explanation for the situation might be that most farmers in the study area are relatively young with less farming experience hence, the length of experience in the study area was not statistically significant. Some studies, Voors and D'Haese (2010), also found out that length of experience was not statistically significant in market channel selection.

**Table 14: Chi-Square Tests Results for Access to Extension Service**

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.023 <sup>a</sup>	4	.040

The Pearson chi-square p-value is 0.040 at a significance value of 5% which meaning that marketing channel choice and access to extension service among vegetable farmers are dependent. This result implies that there was a relationship between farmers' choice of marketing channel and their access to extension services. The availability of extension service in the study area implies that farmers are well informed on production and marketing strategies hence, can are able to participate and choose most profitable marketing channel. Mmbando (2014) reported that access to extension service significantly increased the likelihood that a maize producer will sell to traders relative to brokers which offer low returns.

**Table 15: Chi-Square Tests Results for Labour Engaged in the Farm**

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.770 <sup>a</sup>	2	.001

The Pearson chi-square p-value is 0.001 at a significance value of 5%. This means that marketing channel choice and the labour engaged in the farm among vegetable farmers are dependent. The results are in line with the empirical literature which reported that large households provide cheap family labour required to carry out the various farming operations including the transportation of the farm produce to the market (Donkor *et al.*, 2018).



**Table 16: Chi-Square Tests Results for Distance to the Market**

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.294 <sup>a</sup>	2	.117

The Pearson chi-square p-value is 0.117 at a significance value of 5% which means that marketing channel and distance from home to nearest market among vegetable farmers are independent. According to the descriptive study results most farmers in the study only sell their produce in the markets that are characterised by low transaction costs irrespective of the distance to that market hence, there is no relationship between the distance travelled to the nearest market and the choice of vegetable marketing channel. Maspaiteella *et al.*, (2018) also did not find any significant relationship between the distance to the market and the choice of marketing channel.

**Table 17: Chi-Square Tests Results for Market Information**

	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.895 <sup>a</sup>	1	.001		

The Pearson chi-square p-value is 0.001 at a significance value of 5% and this means that marketing channel and information received on marketplace and product prices among vegetable farmers are dependent. The results of the study are in line with the findings of Adu, (2018) who also established that there was a strong relationship between farmers' access to market information and their choice of marketing channels.

**Table 18: Chi-Square Test Results for Price Determination**

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	16.716	3	.001

The Pearson chi-square p-value is 0.001 at a significance level of 5% and this means that marketing channel choice and the price determination of the produce among vegetable farmers are dependent. The results are in line with the findings of the study conducted by Lefebo (2016), who indicated that one of the primary drivers and factors in making decisions regarding where farmers can sell their output is the lucrative prices that are present in the market at the particular time.

**Table 19: Chi-Square Tests Results for Time of Payment**

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	25.118	2	.000

The Pearson chi-square p-value is 0.000 at a significance value of 5% which means that marketing channel choice and time of payment for vegetables sold among vegetable farmers are dependent. These results are in line with the findings of the empirical study by Adu (2018) which found out that there is a relationship between the payment period and the choice of marketing channels among farmers.

## **Factors Influencing Smallholder Vegetable Farmers Choice of Marketing Channels**

### **Introduction**

This section presents the results of the logistic regression model and discusses the results of the significant variables that determine marketing channel choices among smallholder vegetable farmers in the study area. The variables that were discussed in the previous section were considered for the model and tested for their significance.

### **The Binary Logistic Regression Analysis**

To identify the factors influencing the choice of marketing channels for smallholder vegetable farmers, a binary logistic regression model with a logit link function was used to identify the statistically significant factors, quantify their influence, and identify their relationship as a positive or inverse relationship. The logistic regression results are presented in Table 4.4. The table shows the estimated coefficients ( $\beta$  values), standard error, significant values and the odd ratio of independent variable in the model.

The coefficient values measure the expected change in the logit for a unit change in each independent variable, *ceteris paribus* (Rantlo, Tsoako and Muroyiwa, 2020). The sign of the coefficient shows the direction of influence of the variables on the logit. A positive value shows an increase in the likelihood that a household will change to alternative option from the baseline group. Conversely, a negative value indicates that it is less likely that a household will consider the alternative (Rantlo, Nyanguru and Muroyiwa, 2021). In this study, a positive value implies an increase in the likelihood of changing from participating in the formal market channel to an informal market choice.

The significance values (also known as p-values) show whether a change in the independent variable significantly influences the logit at a given level. In this study, the variables were tested at the 5% significance level. Thus, if the significance value is greater than 0.05, then it shows that there is insufficient evidence to support that the independent variables influence a change away from the baseline group. If the significance value is equal to or less than 0.05,

then there is enough evidence to support a claim presented by the coefficient value. The odds ratio indicates the extent of the effect on the dependent variable caused by the predictor variables. It is obtained by calculating the anti-logarithm of each slope coefficient of predictor variables. A value greater than one implies greater probability of variable influence on the logit and a value less than one indicates that the variable is less likely to influence the logit. The standard error measures the standard deviation of the error in the value of a given variable (Zekic-Susac *et al.*, 2016).

**Table 20: Logistic Regression Results**

	B	S.E.	Wald	d f	Sig .	Exp( B)	95% C.I.for EXP(B)	
							Low er	Upper
Gender	-.944	.589	2.573	1	.109	.389	.123	1.233
Labour engaged in the farm	.592	.696	.723	1	.395	1.808	.462	7.081
Market Information Received	1.470	.999	2.167	1	.141	4.349	.614	30.787
Price Determination	1.095	1.388	.623	1	.030	2.989	.197	45.384
Time of payment	-.726	.340	4.564	1	.033	.484	.249	.942
Access to extension service	- 1.153	1.053	1.200	1	.273	.316	.040	2.484
Constant	-.523	2.016	.067	1	.795	.593		

The explanatory variables in the model are gender of a farmer, labour engaged in the farm, marketing information, price determination, time of payment, and access to extension service.

### **Time of Payment**

This variable was found to have a significant and negative influence on farmers' participation in the formal output markets as it recorded a p-value of 0.033 and correlation coefficient of -0.726. These results imply that a unit increase in the delay to pay for the produce leads to -0.726 decline in formal market participation among vegetable farmers in the study area. The results are consistent with the study's prior expectation that farmers would sell their produce to the market channel that offered them prompt payment and will reduce their sale through

any channel which delays payment for their produce. The results agree with findings of Mazibuko (2020) who stated that payment duration influences the marketing outlet choice decisions.

### **Price Determination**

The results indicated that price determination factor was statistically significant with a p-value of 0.030 and a correlation coefficient of 1.095 and this means that the variable has a statistically and positive influence on participation in the informal output markets. The findings imply that a unit increase in farmers' power to influence prices results in a 1.095 unit increase in participation in the informal vegetable markets among farmers in the study area. The probable explanation is that farmers are more comfortable with market channels that are easily accessible and where they can influence prices (Paenda *et al.*, 2020). These results are consistent with Rantlo, Nyanguru and Muroyiwa (2021) that smallholder farmers of Lesotho prefer informal markets where they are mostly price makers.

## **4.5 Farm Profitability**

This section presents the results of farm profitability for the formal and informal vegetable marketing channels in Leribe district. The Gross Margin was used to determine the profitability of selling vegetables through each marketing channel.

### **Gross Margin**

Table 21 and 22 show the results of gross margin estimates for the two crops, cabbage, and tomato. The gross margin was calculated from 111 smallholder vegetable farmers who provided the required data. Data was collected from farmers selling at two identified marketing channels, namely, formal marketing channel and the informal marketing channel. The formal marketing channel used was the wholesale or supermarket marketing channels. For the informal marketing channel farm gate was used as reference.

Gross margin was used as proxy for profitability and was estimated using total variable costs and total revenue of farmers. Table 21 and Table 22 show the results of the revenue, variable costs, and gross margin analysis. The total variable costs were derived from the sum of inputs costs (seeds, fertilizers, chemicals, water, and packaging materials), labour costs (monthly wage, either permanent or casual) and transport costs (costs incurred during inputs

procurement and vegetable marketing from farm to the market). The revenue was determined by the product of the selling price and the total yield sold. Gross margin was computed as the difference between gross revenue and the total variable costs.

### **Cabbage Gross Margin over 10m \* 30m**

Results in Table 21 show cabbage gross margin over area (10m \* 30m) for formal (wholesale/supermarket) and informal (farm gate) marketing channels. The formal marketing channel yields the total revenue of M 6,000.00 while the informal marketing channel yields the total revenue of M 4845.00. The difference in total revenue could be attributed to relatively high prices offered by buyers in the formal markets. The total variable costs were M 2554.00 and M 2042.00 for formal and informal marketing channel. Based on the analysis of total variable costs, the costs of selling to the formal markets are relatively high due to costs associated with transport costs for delivering to the formal markets that are mostly located far from farmers' dwellings. The gross margin for the formal market channel was M 3,446.00 for the wholesale or supermarket sales. In the informal marketing channel, the gross margin was M 2,803.00 for farm gate sales. These findings imply that selling through formal market channels is more profitable than sales through informal market channels in the study area. The probable explanation for the situation is that even though they are associated with stringent requirements hence, high total variable costs, formal market channels offer lucrative prices for the output sold which compensate for the high production and marketing costs incurred.

**Table 21: Cabbage Gross Margin over 10m \* 30m**

	<b>Formal Marketing Channels</b>	<b>Informal Marketing Channels</b>
	<b>Wholesale/supermarket</b>	<b>Farm gate</b>
Revenue	6 000,00	4 845,00
<b>Total Revenue</b>	<b>6 000,00</b>	<b>4 845,00</b>
<b>Variable Costs</b>		
Inputs	1 054,00	1 042,00
Labour	1 000,00	1 000,00
Transport	500,00	
<b>Total Variable Costs</b>	<b>2 554,00</b>	<b>2 042,00</b>
<b>Gross Margin</b>	<b>3 446,00</b>	<b>2 803,00</b>

Table 22 shows the results of tomato gross margin over 10m \* 30m for the formal (wholesale/supermarket) and informal (farm gate) marketing channels. The formal marketing channel provides the total revenue of M 54,000.00 while selling through the informal marketing channel yielded the total revenue of M 47,000.00. The difference in total revenue could be attributed to relatively high prices offered by buyers in the formal markets. The variable costs were M 23,036.00 for formal marketing channel and M 20,536.00 for informal marketing channel. Based on the analysis of the total variable costs, the costs associated the formal marketing channel are relatively high due to transport costs for delivering to the formal markets that are mostly located far from the farmers dwellings. The gross margin for the formal market channel was M30,964.00 for the wholesale or supermarket sales. In the informal marketing channel, the gross margin was M 26,464.00 for the farm gate sales. These findings imply and affirms that selling through formal market channels is more profitable than sales through informal market channels in the study area. The probable explanation for the situation is that even though formal marketing channels are characterized by stringent requirements resulting in high total variable costs, they offer high prices for the produce sold which compensates for the high production and marketing costs incurred.

From the results of cabbage and tomato gross margins, it can be concluded that formal marketing channels are more profitable than the informal marketing channel

The results agree with previous studies which showed that farmers' participation in higher-value market channels such as wholesale and supermarkets increases their profits (Mmbando, Wale and Baiyegunhi, 2017; Maspaitella *et al.*, 2018) . For instance, Maspaitella *et al.*, (2018), observed that there was a positive relationship between vegetable market participation and farmer's income. Their studies further explained that farmers who sold to high-value market especially supermarket had higher incomes than those who sold through the traditional channel. Mmbando, Wale and Baiyegunhi (2015, 2017), also reported in their study that participation in formal channel increased the income of smallholder farmers.

**Table 22: Tomato Gross Margin over 10m \* 30m**

	<b>Formal Marketing Channels</b>	<b>Informal Marketing Channels</b>
	<b>Wholesale/supermarket</b>	<b>Farm gate</b>
Revenue	54 000,00	47 000,00
<b>Total Revenue</b>	<b>54 000,00</b>	<b>47 000,00</b>
<b>Variable Costs</b>		
Inputs	9 036,00	7 936,00
Labour	12 000,00	12 000,00
Transport	2 000,00	600,00
<b>Total Variable Costs</b>	<b>23 036,00</b>	<b>20 536,00</b>
<b>Gross Margin</b>	<b>30 964,00</b>	<b>26 64,00</b>

Based on the findings of the study, the null hypothesis which stated that farmers who sell vegetables in formal marketing channels are more likely to make profit than farmers who sell vegetables through the informal marketing channels can be accepted

The study further rejects the null hypothesis which stated that the socio-economic characteristics of the farmers are more likely to influence the choice of marketing channel.

#### **4.6 Summary**

This chapter discussed the key findings related to the research objectives and positioned them in the existing literature. Most of the findings were inconsistent with the extant literature on marketing channel choices among smallholder farmers. The study has demonstrated that price determination factor and payment time were the factors that affected farmers' decision on whether to participate in formal or informal marketing channels. The study has also provided a better insight into the effect of marketing channel on farm profitability in the study area. The next chapter outlines the conclusions and policy recommendations based on the key findings.



# **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

## **5.1 Introduction**

This chapter summarizes the key findings of the study and make a conclusion about them. It also provides recommendations for policy makers, extension officers and farmers. The chapter ends with suggestions for the future research.

## **5.2 Summary**

Smallholder vegetable farming has a potential to improve income of farmers due the profitability associated with the choice of the proper marketing channel. Smallholder vegetable farmers in the study area still experiencing low incomes despite their participation in vegetable output market, and high demand for vegetables in the in the country.

The results of the study revealed that smallholder vegetable farming in the Leribe district was mainly dominated by young, aged female farmers, who mostly acquired formal education, and mainly reliant on agriculture as the main source of income hence, main occupation.

The key finding of the study revealed two marketing channels in the vegetable sector in Leribe district, which are the formal and informal market channels. The results further revealed that within the formal marketing channel, farmers sold their produce to the supermarket or wholesale market. In the informal marketing channel, most farmers sold their produce at farm gate, followed by sale to street vendors and lastly sale along roadside. For the two identified marketing channels, the informal marketing channel was used by more farmers than the formal marketing channel.

The study revealed that two factors influenced the choice of vegetable marketing channel in the study area. These factors are time of payment and price determination factor.

The findings of the study further affirmed that selling through the formal market channel was more profitable than sales through informal market channels, this is despite formal marketing channels being characterised by stringent requirements resulting in high total variable costs.

### 5.3 Conclusions

Based on the key findings, the study concluded that:

- There are two main marketing channels used by smallholder vegetable farmers in Leribe district. These are the formal and informal marketing channels. The majority of the farmers used informal marketing channels, comprising of sale at farmgate, sale to street vendors and sale along roadside. The possible reason behind this is the easy entry of informal market channels.
- The identified factors influencing the choice of marketing channel were time of payment and price determination factor. That is, the respondents in the study area made the choice of marketing channel based on time of payment and price determination factor.
- Selling through the formal market channel was more profitable than the informal market channel in the study area.

### 5.4 Recommendations

Based on the key findings of the study, the researcher suggests the following recommendations to policy makers, extension staff and farmers in order to improve access to formal marketing channel.

**Policy makers:** The agricultural policy in Lesotho should incorporate the promotion of farmers' access to a formal market. This could be achieved through capacity building of farmers in order to meet the market standards.

**Extension officers:** The extension officers should be continuously capacitated on agricultural production and marketing to assist farmers meet quality and quantity standards which are the requirements of the formal marketing channel. This is because the study concluded that formal marketing channel was more profitable than the informal marketing channel.

**Farmers:** Market research should be the main starting point of production and marketing for smallholder farmers. Market research enables farmers to produce according to the market standards, while at the same time accessing the formal marketing channel, which according to the results of the study was more profitable than the informal marketing channel.

### **5.5 Further research**

The study identified several limitations and based on these; some suggestions have been made for further research.

- The study was conducted on only 111 smallholder vegetable farmers, using binary logistic regression model as such in one district, hence, a need of conducting the study in other districts with a relatively large sample to avoid bias.
- To determine the profitability of selling vegetables through each marketing channel, the study used gross margin. Hence the study suggests the use of other farm profitability measures to determine profitability of different marketing channels.

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## ANNEXTURE A: QUESTIONNAIRE

### INTERVIEW FOR SMALL-SCALE VEGETABLE FARMERS IN LERIBE DISTRICT

Questionnaire Number

The objective of this study to analyse the effects of marketing channel choice on the profitability of on small-scale vegetable farmers in Leribe district\_ Lesotho.

You are therefore requested to spare some of your time to respond to the questions that follow. The researcher undertakes to keep the information private and confidential. The National University of Lesotho has a policy which requires researchers dealing with human subjects to adhere to ethical conduct and to protect the respondents by respecting their freedom. The analysis will use personal identification numbers that the researcher will assign each respondent. This will protect respondents by making the responses anonymous.

Please, you are kindly requested to respond to this questionnaire.

Your cooperation on the above is highly appreciated.

Thank you in advance for your participation and cooperation in this project!!!

#### PART 1: GENERAL INFORMATION

##### Study Profile

Date of the Interview (dd/mm/yyyy)	
Interviewed by:	
Code of the respondent:	
Village:	
Resource Centre:	
Phone number:	

#### PART 2: DEMOGRAPHIC CHARACTERISTICS

Characteristics	Coding	Response
Age	1 = <30	
	2 = 31-40	
	3 = 41-50	
	4 = 51-60	
	5 = >61	
Gender	1= Female	
	2= Male	
Marital Status	1 = single	
	2 = married	
	3 = divorced	
	4 = widowed	
	5 = other	
Education Level	1 = Illiterate	
	2 = primary	
	3 = secondary	
	4 = tertiary	
Main Occupation	1 = farmer	
	2 = civil servant	
	3 = Unemployed	
	4 = Private Sector	
	5 = Self employed	
	6 = Other	
Main source of income	1 = vegetable production	
	2 = Other farming practices	
	3 = off- farm employment	
	4 = Pension	
	5 = Other	
Farming Experience	1 = Yes	
	2 = No	
If yes, how many years have you been planting vegetables	1 = <10	
	2 = 11 – 20	
	3 = 21 - 30	
	4 = 31 – 40	
	5 = <41	
Please specify skills	Production Experience	
	Marketing Experience	

### PART 3: FARM CHARACTERISTICS

#### 1. General farm information

Characteristics	Coding	Response
Farm Size	1 = <1.0	
	2 = 1.1 - 2.0	
	3 = 2.1 - 3.0	
	4 = 3.1 - 4.0	
	5 = 4.1 - 5.0	
	6 = >5.1	
Land tenure system	1 = Communal	
	2 = Rented	
	3 = Leased	
	4 = Private Owned	
	5 = Others	
Land preparation methods	Manual	
	Ox-drawn	
	Machinery	

## 2. Which crops did you grow last season?

Crop	Area (acres) / m <sup>2</sup>	Total production (kg)/head/bundles

## PART 4: INSTITUTIONAL FACTORS

### 1. Agricultural extension service

a. Did you receive agricultural extension services related to vegetables production last season?

Yes

No

b. If yes, how many extension visits did you receive last cropping season?

Number of visits: \_\_\_\_\_

c. Who was the extension service provider?

1. Government

2. NGOs

3. Research institutes

4. Others

d. What kind of extension service did you receive last season?

- 1. Finance
- 2. Vegetable production
- 3. Marketing of vegetables
- 4. Others

**2. Access to credit**

**Where did you get capital to invest in vegetables farming?**

- 1. Borrowed from the bank
- 2. Borrowed from family
- 3. Borrowed from friends
- 4. Own savings
- 5. Grant
- 6. Other

**3. Type of labour**

What type of labour is engaged in the vegetable farm?

- 1. Permanent labour
- 2. Casual labour
- 3. Family labour

**PART 5: TRANSACTIONAL /MARKETING FACTORS**

**1. Please provide the information on farm inputs and other production costs during the last cropping season:**

Inputs	Package size	Quantity	Unit Price (M)	Total Price (M)
Seed / seedlings				
Fertilizer (Basal)				
Fertilizer (Top dressing)				
Insecticides				
Water				
Packaging Materials				
Transport				

**2. Labour costs**

ACTIVITY	UNIT COST (M)	TOTAL COST (M)
Ploughing		
Planting		
1 <sup>st</sup> weeding		
2 <sup>nd</sup> weeding		
Fertilizer application (top		

dressing)		
Insecticides application		
Harvesting		

### 3. Transport costs

ACTIVITY	UNIT COST (M)	TOTAL COST (M)
Inputs procurement		
Marketing (from farm to the market)		

### 4. What market channel did you use to sell vegetables?

Formal market channel	1. Wholesale /supermarkets	
	2. Processing firms	
	3. Export	
Informal market channel	1. Farm gate	
	2. Street vendors	
	3. Along road side	

### 5. What is the distance from home to the nearest market?

1. > 30 minutes  
 2. 31min – 1 hour  
 3. < 1 hour  
 4. Others

### 6. What is the condition of the road to the nearest market?

1. Tarred road  
 2. Gravel  
 3. Others

### 7. How did you transport vegetable produce to the market?

1. Vehicle  
 2. Bicycle  
 3. Animal's power  
 4. Carry on head  
 5. Others

### 8. Did you receive any marketing information?

1. Yes  
 2. No

### 9. When did you receive information on vegetables prices?

1. Before planting



- 2. Before harvesting
- 3. After harvesting

**10. What are the main sources of market information?**

- 1. Contact with traders/buyers
- 2. Extension officers
- 3. Fellow farmers
- 4. Farmers associations
- 5. Personal knowledge
- 6. Radio
- 7. Mobile phone
- 8. TV

**11. What type of market information do you usually receive?**

- 1. Price information
- 2. Buyers' information
- 3. Market place information
- 4. Other/ not applicable

**12. Who determine the price of the produce?**

- 1. Buyer
- 2. Seller
- 3. Market conditions
- 4. Negotiation
- 5. Other

**13. When are you paid for vegetables sold?**

- 1. At delivery
- 2. In one week
- 3. More than one week
- 4. Other
- 5.

**14. Describe the bargaining position.**

- 1. Accept price offered
- 2. Sometimes bargain
- 3. Set price and do not bargain
- 4. Others
- 5.

**15. What is your level of satisfaction for the prices you receive for the produce?**

- 1. High
- 2. Medium
- 3. Low

**3. What major factors do you think determine the prices you receive?**

- 1. Seasonality or availability of the produce

- 2. Lack of marketing information
- 3. Bargaining/negotiation strength of buyers
- 4. Lack transport
- 5. Do not know
- 6. Other:

**PART 6: PROFITABILITY**

**Revenue from vegetables**

<b>Vegetables grown in the last season</b>	<b>Quantity sold (Kg)/head/bundles</b>	<b>Average price per unit (M)</b>	<b>Total Revenue (M)</b>

**THANK YOU VERY MUCH FOR YOUR COOPERATION**