ECONOMIC ANALYSIS OF THE IMPACT OF COVID-19 ON SMALLHOLDER BROILER PRODUCERS IN VHEMBE DISTRICT MUNICIPALITY OF LIMPOPO PROVINCE, SOUTH AFRICA

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DECLARATION

I, Madula Khodani (16011139), hereby declare that this dissertation submitted to the Department of Agricultural Economics and Agribusiness in the Faculty of Science, Engineering and Agriculture at the University of Venda for the degree of Master of Science in Agriculture has not previously been submitted for a degree at this or any other University. This is my own work in design and execution, and that all material contained therein has been duly acknowledged.

16 August 2023

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Signature **Date**

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DEDICATION

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ABSTRACT

The Covid-19 pandemic has been reported to have disrupted the supply chain of broiler chickens and food systems globally and negatively affecting the production of agricultural commodities. Poultry farming is a significant source of revenue generation for smallholder producers in developing countries. It plays a vital role in fulfilling the daily protein requirements of humans through meat consumption. This study was carried out to analyse the economic impact of Covid-19 on smallholder broiler producers in Vhembe District Municipality of Limpopo province in South Africa. This study adopted a quantitative research method. A simple random sampling technique was used to select the respondents of the study. Data was collected from a sample of 180 smallholder broiler producers through a structured questionnaire. Descriptive statistics was used to analyse and describe socio-economic and demographic characteristics of the respondents. Stochastic frontier production function was employed to determine factors influencing productivity among smallholder broiler producers in Vhembe district municipality. Data analysis on the economic impact of Covid-19 on smallholder broiler producers was done by Microsoft excel. Furthermore, to assess the support services provided by the government to smallholder broiler producers, descriptive statistics was used. The results of the study showed that majority of smallholder broiler producers were females (52.2%). The dominating age group for this study accounted for 41.1% of the respondents and were between the ages of 36 and 45 years. The majority of the respondents in the study area were found to have 6 to 9 years of farming experience (49.4%). Smallholder broiler producers with secondary level of education constituted 43% of the respondents. The results on the factors influencing productivity revealed that labour and feed cost had a positive relationship with productivity both at 1% level of significance. Vaccines were found to have a negative relationship with productivity at 5% significance level. Farming experience and access to extension services was found to have a positive relationship with efficiency. Gender and age were found to be negatively associated with technical efficiency. The study also discovered that majority of smallholder broiler producers, accounting for 67.2%, were negatively affected by the Covid-19 pandemic. Although there were funds provided by the government in a form of grants to help small businesses during the pandemic, the study found that only 39.4% of the respondents benefited from the funds. About 36.7% of the respondents received support through training and information provision. Smallholder broiler producers experienced a decrease in stocking density and decreased income. Based on the findings, the study recommends a partnership between relevant stakeholders such as SAPA to come up with low-cost ingredient feeds as a way to reduce cost of feeds, as this is generally the highest cost incurred in poultry production.

Key words: Covid-19, Lockdown, pandemic, Poultry supply chain, Smallholder broiler producers.

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LIST OF ABBREVIATIONS AND ACRONYMS

FAO	Food and Agricultural Organisation
SAPA	South African Poultry Association
SDGs	Sustainable Development goals
UN	United Nations
UNDP	United Nations Development Programme
WFP	World Food Programme
WHO	World Health Organisation
COVID-19	Coronavirus Disease of 2019.

CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The COVID-19 pandemic has disrupted and badly impacted the worldwide supply chain of broiler chickens and food systems, slowing the poultry industry's potential development. The pandemic's misery was mostly caused by movement limitations put on numerous things such as chicken feed, chicks, medication, vaccinations, and poultry products both locally and worldwide (Das & Samanta, 2021). Restrictions on transportation and people movement have also led to some food logistics challenges (Beltrami, 2020). The pandemic's effect on broiler and other animal supply chains threatens to jeopardise poor and rural people's livelihoods and food security in developing nations. The World Food Programme (WFP) discovered that COVID-19 restrictions hampered poultry producers' access to feed, water, and other production inputs in Eastern and Southern African countries, as well as significant drops in demand for livestock-sourced foods in major importing markets. Many COVID-19-related issues confronted smallholder broiler producers, including supply chain disruptions, manpower shortages, demand disturbances, and changes in consumer buying habits. Scholars and the development community are increasingly recognising the relevance of poultry production systems, particularly broiler systems, to accomplishing United Nations (UN) and Sustainable Development Goals (SDGs) (SAPA, 2020).

Because the research on COVID-19 is still developing, there is little understanding regarding the potential influence on food security and livelihoods of vulnerable groups of society, such as subsistence smallholders (Mhlanga & Ndhlovu, 2020). Because the COVID-19 virus is continually developing, determining its precise effect may be speculative. During the pandemic, the repercussions of COVID-19's influence were determined by the severity of the pandemic in each country, the actions implemented by the government, the engagement of international players in dealing with the crisis, and the resilience of the smallholders themselves.

As noted by Oluwatayo et al (2022), COVID-19 was a threat multiplier as it worsened the weak economic indices since the South African economy was already witnessing negative growth. Their argument was based on the fact that South Africa accounted

for the highest number of confirmed cases in Africa thus having to bear a greater burden of the COVID-19 relative to any other African country. The outbreak of the COVID-19 has posed disruptive changes in the normal operations of markets (local and international) and economic structures.

Due to COVID-19 pandemic impact on the economy, it was deemed necessary to conduct a study of this nature to navigate and identify to what extent smallholder broiler producers were impacted and therefore to navigate a way forward through recommendations. The United Nations Development Programme (UNDP) Regional Bureau for Africa (2014) also reveals that as government policies restricted the movement of people through road blockages and community quarantines in West Africa as a response to the pandemic, markets were disrupted, leading to food shortages, and higher prices, especially on staple foods. This directly impacted on the livelihoods and food statuses of the peasantry in particular.

1.2 STATEMENT OF THE RESEARCH PROBLEM

On December 31, 2019, the first case of infection with a novel coronavirus, which causes the illness now known as COVID-19 (Wang, 2020), was reported in Wuhan, China (WHO, 2020). Since then, the number of worldwide confirmed cases of infection with this new virus has increased alarmingly, and it has become the primary global health issue, threatening the normal development of civilization and all of its components.

The COVID-19 pandemic has put people's lives and livelihoods at danger on a worldwide scale, and the full extent of its effects has yet to be fully recorded (Morton, 2020).

Although the agricultural sector was exempted from some of these restrictions and lockdowns, as expected given its importance to the economy, commercial large-farm holdings and small-scale farming activities operating within an organised sub-sector were the main beneficiaries Andam et al. (2020). Smallholder broiler producers work informally in a less structured agricultural sub-sector in which farmers live mostly in rural communities but trade through interstate roads and marketplaces (formal or informal) in peri-urban and metropolitan areas (FAO, 2021).

The COVID-19 and subsequent lockdown were sure to have an influence on smallholder broiler production systems across the world, with multifaceted effects and unpredictability. This effect on smallholder broiler producers was vital since

smallholder agriculture is key to ensuring food and nutritional security, particularly in the global south Boughton et al. (2020). Due to the pandemic, access to markets and live birds along roads were limited, affecting the income and lives of smallholder broiler producers. These developing difficulties influenced and endangered the value chain operations of smallholder producers, from input sources through consumption.

1.3 JUSTIFICATION OF THE STUDY

The agriculture industry is one of South Africa's most important economic foundations. It is critical to guaranteeing food security, lowering the unemployment rate, and raising the living standards of rural farmers. However, the breakout of the COVID-19 pandemic and the ensuing government steps to control the virus's spread had a significant influence on developing-country broiler production systems. According to Hobbs et al. (2019), these containment efforts have had a significant impact on the movement of agricultural commodities from farmers to consumers, putting food supply networks at risk of disruption. According to (Hafez & Attia, 2015), the pandemic has interrupted various operations throughout poultry supply chains and offered unprecedented hurdles to smallholder poultry producers. Based on this, it is no longer a secret how badly the COVID-19 pandemic has impacted small businesses throughout the world. As a result, it was thought necessary to perform this research in order to assess the economic impact of the COVID-19 pandemic on smallholder broiler producers in Vhembe District Municipality.

1.4 RESEARCH OBJECTIVES AND QUESTIONS

The goal of this research was to give economic insight into the impact of the COVID-19 pandemic on smallholder broiler producers in Vhembe District Municipality Limpopo province of South Africa.

1.4.1 Main Objective of the study

The main objective of this study was to analyse the economic impact of COVID-19 on smallholder broiler producers in Vhembe District Municipality of the Limpopo province in South Africa.

1.4.2 Specific Objectives of the study included:

I. To identify and describe the smallholder broiler producers based on their socio-economic and demographic characteristics of Vhembe District Municipality

II. To determine factors influencing productivity among smallholder broiler producers in the study area.

III. To analyse the economic impact of COVID-19 on smallholder broiler producers;

IV. To assess the support services provided by the government for smallholder broiler producers.

1.4.2 Research questions

I. What are the socio-economic and demographic characteristics of smallholder broiler producers?
II. What are the factors influencing productivity among smallholder broiler producers in Vhembe District Municipality?
III. What could be the livelihoods (economic) implications of the COVID-19 pandemic for smallholder broiler producers in Vhembe District Municipality?
IV. To what extent are the support services provided by the government to smallholder broiler producers harnessed?

1.5 CONCEPTUAL FRAMEWORK

The poultry industry in South Africa has been always known as the most promising industry in the agricultural sector in terms of volume and its contribution to the national Gross Domestic Product (GDP) regardless of the challenges it faced. The productivity of smallholder broiler producers has been always affected by the high inputs' costs, which has been always a challenge. In rural communities, majority of people engage in broiler production for income generation to be able to afford basic needs of life.

During the pandemic, the government implemented the lockdown as an attempt to control the spread of the virus among citizens. This caused a shock in almost every sector on a global level. This study adopted the conceptual framework from Constantino (2020). The conceptual framework was designed in way to assess the implications of the pandemic on smallholder broiler producers. Labour shortages, disrupted supply chains, and shortages of inputs were part of the implications that came with the COVID-19 pandemic on smallholder broiler producers. Smallholder broiler producers perceived loss of income, high mortality rate as well their livelihoods

were negatively affected thus forcing business owners to reduce the number of employees and some even closed down their business.

The conceptual framework below (figure 1) provided a direction in which the study took to address its objectives. The study considered socio-economic characteristics of smallholder broiler producers as the significant influencers of the economic impact of the COVID-19 pandemic. The study also assessed the support services provided by the government to smallholder broiler producers. The desired outcomes of the study included increased production ,sustainable businesses ,increased income flow as well as undisrupted supply of feeds and vaccines.

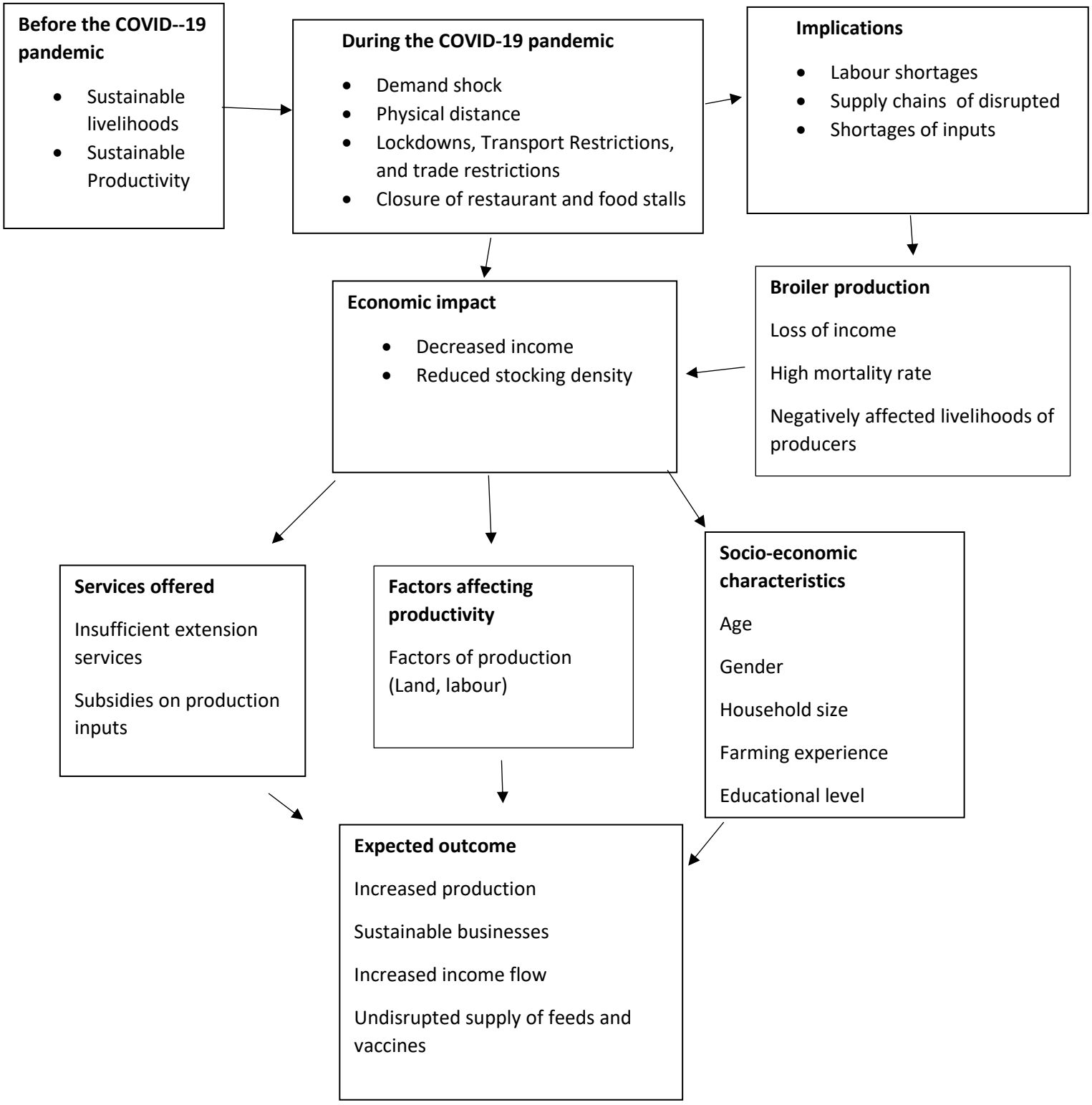

Figure 1: Conceptual framework, adapted from, Constantino et al. (2020)

1.6 OPERATIONAL DEFINITIONS OF THE KEY TERMS AND CONCEPTS

1.6.1 COVID-19

A highly contagious respiratory disease caused by the SARS-CoV-2 virus (WHO, 2021).

1.6.2 Lockdown

Lockdown is an emergency declaration implemented by the government and a directive for people to confine themselves at a specific place, usually at their home, to avoid particular risks to themselves or others (WHO, 2020)

1.6.3 Smallholder broiler producers

In the context of this study, smallholder broiler producers and smallholder farmers were both used interchangeably to describe farmers who are commonly associated with broiler production (DAFF, 2012)

1.6.4 Poultry supply chain

A supply chain consists of all parties (manufacturers, suppliers, transporters, warehouses, retailers, and customers) and, within a poultry business, all the functions involved, directly or indirectly, in fulfilling a customer request (Chopra & Meindl, 2010).

1.6.5 Pandemic

A pandemic is described as an epidemic occurring worldwide, or over a very broad area, crossing international boundaries, and usually affecting a large number of people (Last et al., 2001).

1.7 DELIMITATION

Delimitation of the study was that only smallholder broiler producers in Vhembe District Municipality were considered for the study.

1.8 OUTLINE OF THE RESEARCH

This dissertation consists of five chapters which are as follows:

Chapter 1: Introduction

The first chapter provided the general introduction of this study. It consisted of the background, problem statement and aim and objectives of the study.

Chapter 2: Literature review

This chapter was concerned with a review of literature on the economic impact of COVID-19 on smallholder broiler producers. This chapter explored the extent of the challenges brought by the pandemic on the South African poultry industry. In reviewing the literature on this impact, this dissertation did so against the background that many issues of measurement and incidences that are still being hotly debated. This chapter, therefore, played a crucial role in terms of the subsequent chapters.

Chapter 3: Research methodology

Chapter 3 outlined the methodology and analytical procedures that were undertaken in this study. It described the study area, research design and strategies which were adopted for the purpose of the study, population and sample size of the respondents.

Chapter 4: Results and data analysis

This chapter entailed inferential data analysis and presentation of the results. The results were presented using and pie charts, bar graphs and were discussed and interpreted descriptively in a narrative form using the literature review.

Chapter 5: Summary, conclusion and policy recommendations

The last chapter summarised the study and conclusions about the research objectives. Based on the findings and conclusions, the recommendations were also made, not only for this study, but also for future studies arising out of the results of this study.

CHAPTER TWO
THEORECTICAL FRAMEWORK AND LITERATURE REVIEW

2.1 THEORECTICAL FRAMEWORK

2.1.1 Introduction

The study was framed using the Theory of Production, which is concerned with how increased production can lead to better income and eventually improved welfare outcomes. The main concept involved in the debate presented in this paper included the impact of labour, price changes, changes in stocking density and their influence on productivity. Sub section 2.1.2 discussed this concept and the different approaches to measure productivity.

2.1.2 The Theory of Production Framework

The Theoretical Framework for this study drew on the Theory of production which provided useful framework for understanding the factors that influence producers' productivity. For the purpose of this study, the focus was on the changes in output/productivity as a result of the impact of COVID-19 pandemic on smallholder broiler producers in Vhembe District Municipality. The questionnaire was designed in a such a way that enabled the researcher to get results on whether the stocking density of smallholder broiler producers decreased during the pandemic, as well as if the smallholder broiler producers noticed a decrease in income as a result of the COVID-19 pandemic. According to the Theory of Production, the output is influenced by a range of factors, including labour, land and capital. How factors of production are managed plays a significant role in the output.

The Theory of production is usually illustrated by production functions such as Cobb Douglas, Stochastic Frontier Analysis and Data Envelopment analysis amongst others. However for the purpose of this study, Stochastic Frontier Production Function and Technical Efficiency was adopted to determine the relationship between inputs and output. Stochastic Frontier Production Function and Technical Efficiency were used to determine factors influencing productivity among smallholder broiler producers which was the second objective of the study.

Technical efficiency model was used to determine the factors that affect the technical efficiency of smallholder broiler producers (Khai and Yabe, 2011). Also, technical

efficiency of a farm ranges from 0 to 1. Maximum efficiency in production has a value of 1, meaning that the more the figure gets closer to 1 the greater the technical efficiency. Lower values represents less than maximum efficiency in production (Ali and Samad, 2013).

2.2. LITERATURE REVIEW

2.2.1 Introduction

This chapter reviewed the economic impact of COVID-19 on the overall poultry industry. The challenges brought by the pandemic on smallholder broiler producers in South Africa were discussed. This chapter also compared the broiler industry before the pandemic, and post the pandemic. Lastly, a review on findings on socio-economic factors that influence the impact of COVID-19 on smallholder broiler producers from various developing countries were discussed.

2.2.1 REVIEW OF PREVIOUS STUDIES

2.2.2 Background of the South African Poultry Industry

In the past, excess chicken has been dumped in South Africa. How do we know that? Because countries and producers have been found guilty of dumping, that is why we have some anti-dumping tariffs put in place against some of them (SAPA, 2018). South Africa's chicken producers have been vocal about the impact of dumping on the domestic market, particularly by the US and Europe, which they argue is killing the sector and destroying jobs. The dumping of chickens in South Africa results in domestic producers, particularly those of a smaller scale, being pushed out of the market (SAPA, 2018).

It is worth reiterating that the South African poultry industry is an interesting industry in that it consists of a few large-scale producers and a plethora of small-scale farmers. The performance of the poultry industry since 2006 has been impressive (SAPA 2009; 2011). However, the high input costs, high inflation, the global economic recession and a subsequent slowdown in consumer demand and job losses during 2007 to 2009, negatively impacted the broiler industry performance in South Africa (FAS 2010). As envisaged, the broiler meat demand started growing again in 2010 as the domestic economy recovered from the global recession.

The two most important factors that drive demand for broiler meat are economic growth and competitive broiler meat prices. Economic growth is the main driver for

increased demand for broiler meat as rising living standards are expected to push large numbers of consumers towards protein-rich diets, increase health awareness and desire for convenience. Other reasons for the expected increase in the consumption of broiler meat include increased marketing by broiler producers, and price competitiveness relative to other proteins on the market. There is still scope for growth in the South African poultry industry, given the still relatively low per-capita consumption of chicken meat in South Africa compared with other economies in the world (Sovereign Foods, 2010). Sovereign Foods (2010) argues that more consumers will demand chicken as the world continues to face higher food prices. The local poultry industry has a major role to play in ensuring that all South Africans have continued access to high quality, affordable protein.

Poultry farming has a long-standing history in agricultural development and the quest for increased nutritional value but less emphasis has been put on the sector (Adei, 2012). Since independence, agriculture has been the major employer of the labour force in South Africa (statistics SA, 2019)

The Covid-19 pandemic affected numerous industries on a global level. The agriculture industry was equally affected (Kharbikar et al., 2020). Farm managers had to put their human resource management strategies together to plan and implement effectiveness in farms. The South African government declared agricultural services as essential which meant farm employees had to work during the pandemic. however there were concerns from the poultry industry of South Africa in that local producers are efficient and world-class, but cannot compete in an unfair environment. Given the foregoing overview, it was deemed important to analyse the economic impact of COVID-19 on smallholder broiler producers in Vhembe District.

2.2.3 Contribution of the poultry industry to the South African economy

The poultry industry in South Africa accounts for more than 17% of the agricultural gross domestic product (GDP), making it the biggest agricultural sector with the gross value of R23 billion in 2009 (FAS 2010), thus making it an important sector in the South African quest to reduce unemployment and food insecurity. Furthermore, poultry meat remains the most affordable source of animal protein relative to other meat protein sources (SAPA, 2009). The South African poultry industry is broadly made up of 404

commercial broiler producers, of which 199 are independent individual producers and 205 are contract growers for the larger chicken producing companies (SAPA 2011).

It can be argued that to date, the sector has made a meaningful contribution to the development of black poultry farmers in South Africa. The government is hungry for a success story in this industry. Should the poultry sector be protected by the SA government from cheap imports from the likes of Brazil, the situation may change and perhaps a success story in this industry will emerge, but this will require sufficient support from the government and poultry sector partners to advance the sector and allow it to claim its spot as one of the sectors to achieve government priority areas such as food security and employment creation (NAMC 2021).

In a report by the South African Poultry Association (2022), it is stated that although the country's poultry sector has faced numerous challenges over the past years, ranging from chicken dumping and illegal imports to avian influenza, civil unrest and the Covid-19 lockdowns, the Association has made some decisive improvements to the sector. SAPA worked hard on behalf of members, non-members, cull buyers, industry suppliers and service providers to pave the way for them to be listed as critical suppliers for the designated essential services (SAPA 2020). This was because of the essentiality of the sector participants in ensuring food security and reducing the unemployment rate. The poultry industry stepped up to the plate as the lockdowns began to take their toll on food security in the country (SAPA 2020).

The demand for foods of animal origin is expected to grow by 70% (2005–2050), and the highest expected shares would be contributed by poultry meat (121%) (Mammo 2020). Which support why the government is channelling investments towards the development of small-scale producers in the country to be able to achieve the goal. The shortfall between demand and supply has necessitated significant importation of poultry products.

2.2.3.1 Poverty alleviation, food security and employment creation

Agricultural growth is critical for hunger reduction. Some 70 percent of the poor in developing countries live in rural areas and depend on agriculture for their livelihoods, either directly or indirectly. In the poorest of countries, agricultural growth is the driving force of the rural economy. Particularly in the most food-insecure countries, agriculture

is crucial for income and employment generation. Combating hunger requires an expanded commitment to agriculture and rural development" (FAO, 2006).

In 2000, world leaders agreed to the Millennium Development Goals (MDGs), with Goal One being to halve the number of poor people by 2015. According to the World Bank (2005), there were 1.1 billion people subsisting on an income of less than US$1 a day in 2005. The MDGs Report for 2006 notes that there is still much to do to combat poverty; 824 million people in developing countries were affected by chronic hunger in 2003, with Poultry in the 21st 2 Century the problem being particularly acute in sub-Saharan Africa and South Asia (UN, 2007). This situation challenges all sectors – including the poultry sector and the livestock sector more broadly – to reflect on the contribution they can make to poverty reduction.

Many poor families in developing countries are involved (and skilled) in poultry keeping. Thus, the link between poultry interventions and improvement of their status – along with the associated improvements in terms of nutrition and other benefits for the entire family (Quisumbing & McClafferty, 2006) – seems to be direct. The scavenging poultry production system is the most common animal production system among poor households in rural areas of developing countries. Interventions to improve these modest levels of production may be justified, as they can help families to generate social capital and enter a positive spiral of events that may move them out of poverty (Jensen & Dolberg, 2003).

The objective of poverty and malnutrition alleviation cannot be pinned down by a single peg. No single effort will achieve a major impact in isolation. However, poultry has shown to offer a practical and micro level step in alleviation of rural poverty. There is evidence that investments in small-scale poultry farming generate handsome returns and contribute to poverty reduction and increased food security in regions where a large share of the population keeps some poultry birds (Jensen & Dolberg, 2003; Pica-Ciamarra & Otte, 2010). In Malawi, about 83% of rural households are estimated to keep flocks of 1 to 20 birds (Gondwe & Wollny, 2002).

Food security and supply are a significant concern facing the world today, with the most recent estimates revealing that 795 million people, nearly one out of ten people in the world, are affected by chronic undernutrition, with most severe cases of hunger, malnutrition, and health-related undernutrition in Africa (Masemoa, 2017). According

to the World Bank (2013), the proportion of the people in Africa who live in extreme poverty and undernourishment has decreased considerably from about 57% in 1990 to about 41% in 2013. Nevertheless, until recently, the largest share of the global population of extremely poor and undernourished people, of more than all other regions combined, still live in Africa. Despite the important role of poultry production in alleviating food insecurity, uplifting rural livelihoods and supporting gender equity, most governments in developing countries attribute low importance to this production system (Pym, 2013).

The food supply chain is a network that connects an agricultural system (the farm) with the consumer's table. The poultry industry continues to pride itself on the fact that it feeds the nation, as more poultry products are consumed every year than all other animal protein sources combined.

The estimated direct employment in the broiler industry in 2019 was 51 612 (SAPA, 2018). This number includes hatcheries, rearing, processing and distribution. In addition to its importance as a source of food and its contribution to the nation’s Gross Domestic Product, the SA poultry industry remains an important contributor to job creation and employment opportunities, both in the formal and informal sectors, with more than 80% of the industry consisting of SMMEs (Small, Medium and Micro Enterprises). Approximately 10% of all agricultural sector workers are employed in the poultry sector.

2.2.4 The impact of COVID-19 on the South African broiler industry

The COVID-19 pandemic has a great impact on the actions and activities of humanity, agriculture is not outside this impact. Food demand and thus food security are greatly affected due to mobility restrictions, reduced purchasing power, and with a greater impact on the most vulnerable population groups. As cases of contagion increase, governments take more drastic measures to stop the spread of the virus, also influencing the global food system.

The COVID-19 pandemic, unlike previous pandemics such as SARA-CoV and Ebola, severely impacted the food supply chain indirectly through disruptions of the downstream stages such as transport and logistics Hashem et al, (2020). Further, the outbreak of the COVID-19 pandemic and the related containment measures, including the imposition of national lockdowns and border closures, undeniably slowed

economic activity in most African countries and worsened the plight of many low-income and vulnerable households, most of whom are engaged in agricultural activities Osabuohien et al, (2022).

There are perceptions that farm households were more adversely impacted by the pandemic than non-farm households, partly due to their already low levels of income and limited diversification. The fact that smallholder farming systems in Africa are generally labour-intensive and rainfall-dependent, and have weak linkages between input and output markets as well as limited post-harvest technologies and infrastructure increased their vulnerability to the adverse effects of the COVID-19 pandemic (Nhemachena and Murwisi 2020), as it came with the enforcement of social distancing, working from home, restricted transportation, and lockdowns (Osabuohien et al. 2022; Ufua et al. 2021).

Nevertheless, the COVID-19 pandemic globally affecting poultry consumption, transport, the economics of poultry farming, consumer trust, product quality and protection, product types, and disease emergence and re-emergence that continue to pose significant challenges to the current situation and the industry's strategic future (Hafez and Attia, 2020). About 25-30% of poultry entrepreneurs have lost their working capital, where a considerable number of small-scale farmers are also included and eventually suffer tremendous economic losses (Saleque, 2020; Mahmud, 2020).

2.2.5 Challenges faced by the poultry industry in South Africa

Broiler production, in particular, for many years has provided a pathway into enterprising for small-scale farmers and women, and in ensuring food security for underprivileged households, thus contributing to millennium goals regarding gender issues Vaarst et al, (2015). However, broiler production is an expensive business that requires costly investments in specialized infrastructure. Although the poultry sector has strong potential to adapt and thrive, it is often not possible for small-scale producers to take the necessary adjustments McLeod et al, (2009). Owing to factors of competition and lack of biosecurity controls, majority of small-scale producers fail to enter the retail market for sustainable enterprising. Factors at play include the cost of feeding, electricity, water quality and supply, as well as proximity of small-scale producers to chicks and feed suppliers, processors and markets (SAPA, 2018).

Engaging in the commercial poultry production system requires that all standards of operation are adhered to starting with breeding to handling and transportation of chicks, processing (feed ingredients and chicken products) and feed manufacturing. While access to markets remains critical for small-scale farmers, growing markets continue to benefit large-scale operations. The major challenge for small-scale producers is unsustainable production systems owing to dependency on government for inputs ranging from housing, feeds, vaccines and poultry species (day-old chicks and point-of lay pullets) to marketing. This embodies the conviction that the private sector is a great untapped resource for investment and innovation to achieve the MDGs (UNDP, 2008). Together, public- and private-sector institutions determine the information that key food system actors have about the performance of alternative approaches to farming and food provision and affect the relative economic viability of farm production and food processing systems Nesheim et al, (2015). What is needed is a transparent vision and differentiation between commercial and small-scale poultry production.

Given the size of the industry and the challenges faced, the success of the industry in achieving its vision seems impossible, unless the government puts measures in place to deal with these challenges and plays a critical role in the promotion of local produce. Given the high imports of broiler meat from countries such as Brazil, it is evident that South Africa is still unable to produce enough broiler meat to meet consumer demand (NAMC, 2019).

Since the implementation of the agreement, Rainbow Chicken (RCL Foods) has reportedly cut 1 350 jobs and repositioned a further 200 staff members who were working in the chicken producing operation. The group was also planning to sell many of its broiler farms. It was claimed to be part of measures by RCL Foods to diversify their business model. The exact number of job losses in the industry is still vague but is said to be in the range of 4 000 to 5 000 so far, with a further 110 000 at risk in the industry and roughly 20 000 jobs threatened in the feed industry.

The COVID-19 pandemic has exposed a lot of smallholder farmers to harsher conditions and unfavourable environment which made it difficult for farmers to remain active in farming, leaving a number of smallholder broiler producers with no other options than to throw the towel and give up. South Africa is thriving towards

transformation agriculture but the pandemic has moved the sector 2 steps back. The attempts of the government to develop smallholder farmers in south Africa is faced with a number of challenges. Most farmers are poor and the system seems to be continuing not to favour them.

Generally, Smallholder farmers have fewer resources and technology than commercial-scale farmers and many of these smallholder farmers are poor and somewhat neglected. A study by Maertens et al, (2012) found that the penetration of modern food retail in developing countries was able to reduce poverty but due to competitiveness in the agri-food industry and volatility of food crop prices and the rising cost of inputs such as fossil fuels, fertilizers, and pesticides have made it nearly impossible for many of the world's smallholder farmers to continue managing their agroecosystems. This clearly shows how important the smallholder farmers are in reducing the challenges south Africa is facing (unemployment, poverty, hunger) but it seems impossible with the challenges they face on a daily basis.

2.2.5.1 High transaction costs

Several researchers identify high transaction costs as one of the leading constraints for poultry production among smallholder farmers in South Africa (Ndoro, Mudhara, & Chimonyo, 2014; Nkhori, 2004). They describe transaction costs as costs related to the exchange of property rights from one person to another, including amongst others the knowledge, mediation, supervision, co-operation and enforcement of contracts (Makhura, 2001). While these transaction costs are an inherent part of the pursuit for market access, once they become high, they have the potential to hinder farmers to grow and expand their productions. According to Ndoro *et al*. (2014), high transaction costs reduce both the supply of marketable stock and profits accrued. Therefore, smallholder broiler farmers should aim to minimise these costs rather than eliminating them completely Mmbengwa *et al*, (2015), to improve their integration, participation and efficiencies in accessing commercial markets.

2.2.5.2 Low market off-take rates

The poultry off-take rate can be defined as the proportion of birds sold per year relative to the number of poultry owned by the farmer. Stroebel, Swanepoel, Nthakheni, Nesamvuni, and Taylor (2008) analysed the benefits of being a producer by 128 smallholder farmers in Limpopo Province. One interesting finding to emerge from this

study was the low off-take rate (8.70%). Similarly, Ainslie (2005) notes low off-take rate as one of the main constraints for the marketing of poultry products.

2.2.5.2 Access to finance and markets

Many people are directly dependent on this industry for their livelihood. To protect the poultry sector from fierce foreign competition, the government has adopted various measures. For instance, imposing import levy or quantitative restriction to protect domestic producers from the influx of import farming (Alho, 2015).

The stakeholders view that though poultry sector received adequate access to credit mainly from the NGOs but access to working capital by the smaller firms in particular still remains a major hurdle (Akinfiresoye & Agbetoye, 2013). It is also felt that the overall distribution management of chicks, eggs, medicine, vaccine, and poultry was identified as another cause of high mortality and low profitability. Many authors have identified poultry production problems to include low capital base, inefficient and ineffective management, poor pricing, poor marketing, and diseases (Alabi et al., 2000; Carter, 2005).

Further, Aromolaran et al, (2013) reported poultry problems in Ibadan, Oyo State, Nigeria, from the highest to the minimum as disease and pest attack, difficulty in credit and loan procurement processes, high cost of drugs and vaccination, market and price fluctuations, lack of technical-know-how in poultry handling, feed quality availability, high mortality of the birds, unsatisfactory healthy breeds availability, accessibility of feed, high cost of feeds and poor infrastructure like water and electricity supply.

2.2.6 Socio-economic characteristics of smallholder broiler farmers

2.2.6.1 Gender and age, household size and income, level of education

Agricultural practices in many countries are characterized by gender inequality. Males are more likely to be more successful farmers compared to their female counterparts. This is because male farmers focus more on profit maximization while female farmers mostly focused on the family welfare that resulted in low proportion of female farmers to attaining success in the agribusiness market. In a study done in Ghana, Njukia et al. (2011) highlighted that male were more successful in market participation than women due to their competitiveness. Furthermore, Mitiku and Bely (2014) note that male farmers usually have higher potential of crop production efficiency advantage, access to market information and income than the female-headed households. This

explains the success of male farmers on transformation from emerging to commercial farming. In South Africa, (Moyo, 2013) argues that the probability of being female decreases the chances of being a commercial farmer and that many female farmers were practicing emerging farming specific for home consumption. In Limpopo Province, in contrasts to many other findings, there seems to be dominance of females to transform from emerging to commercial farming (Laven & Pyburn, 2015).

The level of education determines the farmers' acquisition of skills and application of those skills to farming practices. This is attained formerly through attending seminars, workshops and conferences where farmers access knowledge and innovation (Yamusa & Adefila, 2014). Productivity of the farms managed by a higher educated group is higher than the farms managed by a less educated group. It was also found that since educated groups are well advanced; they know better business techniques than their counterparts Alam et al., (2009). Botlhoko and Oladele (2013) found that educated farmers are likely to adopt innovation than illiterate farmers, hence, their productivity increases resulting in greater farms' returns.

This determines farmers' scale of production and the types of enterprise they undertake. Adeniyi (2013) further notes that farmers with high income were able to expand their landholding for commercial farming and to maintain the standard of high income. In South Africa, some households were able to generate annual income that ranged between R10 000 and R50 000 per month. The regular inflow of income from their farming activities assists them to expand their farming activities that resulted in progress in transformation process, Oni et al., (2010). Lipton (2013) highlights that such income levels are much higher than experienced in countries such as Russia where majority of farmers did not commercialize their farming ventures. The availability of farming inputs, market support services, credit funds and extension services that could stimulate agribusinesses are vital for promoting agriculture transformation in Sub-Saharan Africa (Muzari et al. 2012). Lack of access to market information, higher price of fertilizers, limited possession of draught power, shortage of household labour and distance to local markets constrains transformation of emerging agriculture and intensity of commercialization in Ethiopia (Hailua et al., 2015). Along the same lines, Khapayi and Celliers (2016) found that many farmers did not have access to market information in Eastern Cape, South Africa. Such farmers were unlikely to participate in marketing due to lack of information. In Sri Lanka, genetically modified seeds were

vital in the success of commercialization. Farmers who were able to adopt this technology were likely to improve their farming practices. The success of transformation depends on the distribution of quality seeds (Hailua et al., 2015). FAO (2014) concludes that most commercial farmers in Kenya have adopted the use of input variation.

Land availability influences the expansion of emerging farming in most countries. Thus, government land tenure and distribution processes influence emerging transformation. For instance, in Ethiopia, Leykun and Jemma (2014) report that as cultivated land increases by one unit, the probability of commercialization increases. Forbord et al. (2014) suggest that different tenure systems also contribute to emerging farmers' access to land. Land tenure included the acquisition of communal land, rental land or private land. Mingxuan et al. (2011) further note that growth in agribusiness sectors in China is affected by weaker ownership of land. The need to accelerate the land tilling process and build up the capacities of relevant land administration agencies help to facilitate the availability of land for transformation.

2.3 SUMMARY OF LITERATURE REVIEW

The focus of this chapter was to indicate the studies conducted which focused on the impact of the Covid-19 pandemic. This chapter reviewed studies one the contribution of the poultry industry to the south African poultry industry through poverty alleviation, ensuring food security and employment creation. The challenges that the industry is facing were also considered to be able to assess the support services required by the smallholder broiler producers specifically.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presented the methodology and the analytical procedures that were undertaken to obtain the results of the study. It described the study area where the data was collected, the data sources and sampling techniques, analytical models which were used in the study and the limitations of the study.

3.2 DESCRIPTION OF THE STUDY AREA

The study was conducted in Vhembe District Municipality, situated in the Northern region of Limpopo Province in the Republic of South Africa. The Vhembe District Municipality is one of the five district municipalities found in the Limpopo province. Its geographical coordinates are 22.7696°S,29.9741°E. It shares its borders with countries across different areas of the province such as Zimbabwe in the northern site, Mozambique through Kruger National Park in the eastern site and Botswana in the North Western site. The Vhembe District Municipality has an area cover of approximately 25 956 km2 and encompasses four local municipalities namely, Collins Chabane, Makhado, Musina and Thulamela (Vhembe District Municipality IDP Report, 2017/18 -2021/22). Vhembe district is one of the major producers of tea, bananas, mangoes, nuts and pawpaw's in South Africa, which are consumed locally and internationally. However, for the purpose of this study, the main focus was on smallholder broiler producers. Figure 3.1 below indicates the Map of Vhembe District Municipality and the different local municipalities found in the Vhembe District Municipality.

Figure 3. 1: Map of Vhembe District Municipality

Source: www.municiaplities.co.za/map (accessed:17 August 2021)

3.3 POPULATION AND SAMPLING METHOD

Smallholder broiler producers in Vhembe District Municipality were the study's target group. A sample of 180 smallholder broiler producers in Vhembe District was chosen using a multistage and random selection approach. The multistage process begins at the district level and progresses to municipalities and finally to villages. The multistage sampling technique is a method that involves breaking down the target population into successive stages, with each stage involving a different sampling approach. This technique is especially useful when the population is large and dispersed, making it impractical to collect data from all members. At the initial stage, the Vhembe District was chosen as the primary sampling unit. This choice served as the starting point for the sampling process. The district level was selected because it represents a manageable administrative division and captures a significant portion of the target population. Within the Vhembe District, a selection of municipalities was made. This stage involved the identification and inclusion of the municipalities within the district. This was done to ensure representation of various geographic and demographic characteristics of the district. From the selected municipalities, further refinement occurred by choosing specific villages. This stage aimed to capture the diversity of the

smallholder broiler producers across different localities, taking into consideration factors such as farming practices and socio-economic conditions. Once the villages were identified, the next step was to select the respondents. Here, a probability proportionate to size (PPS) technique was employed. This technique involved determining the size of the broiler production within each village as a proportion of the overall district's broiler production. The larger the broiler production in a village, the higher its chance of being selected. In this stage, randomization played a crucial role. Each individual broiler producer within the chosen villages had an equal chance of being selected, but this chance was weighted by the size of their broiler production enterprise. This ensured that the sample is representative of the distribution of broiler production across the Vhembe District.

Justification for the Choice of Sampling Techniques

Multistage Approach: The use of a multistage approach allowed for a systematic selection process that accommodated the hierarchical structure of the target population. It also enabled efficient data collection by narrowing down the selection process from districts to villages. Probability Proportionate to Size (PPS): PPS was chosen to ensure that larger broiler producers, which contribute more significantly to the overall production, have a higher chance of being included in the sample. This helps in obtaining a sample that is representative of the district's broiler production landscape. The data was gathered from 56 smallholder grill producers in Thulamela municipality, 67 in Makhado municipality, 31 in Musina municipality, and 26 in Collins Chabane municipality. The strategies used allow all producers in the population an equal chance of being chosen (Ross, 2005). The National Agricultural Marketing Council chicken baseline report (NAMC 2020) provided information on the availability of smallholder broiler producers. In other cases, the researcher had to ask local residents where to locate the producers since some of them were not registered with extension officials and their firms were not registered.

3.4 DATA COLLECTION METHOD

Data was collected through personal interviews with the farmers around Vhembe District Municipality. The questionnaire was administered through a semi-structured interview with the respondents. In obtaining information from participants, the researcher provided all the smallholder broiler producers with open-ended and closed

ended questionnaire to voice out on how they have been affected by the COVID-19 pandemic. The questionnaire consisting of a set of predetermined questions written in English were administered. However, since the most dominant language of the study area is Tshivenda, translation of the questionnaire into preferred languages where necessary was done. The questionnaire was provided by the researcher with the assistance of enumerator.

3.5 ANALYTICAL MODELS

For inferential analysis, the primary data collected was analysed using the recent programme of IBM Statistics Package for Social Sciences (SPSS), Microsoft excel and descriptive statistics. Data analysis focused on the four study objectives as indicated below.

3.5.1 Objective 1: To identify and describe smallholder broiler producers based on their socio-economic and demographic characteristics

Descriptive statistics was used to summarize the data collected for this objective. Frequencies, percentages and pie charts on demographic information such as age, gender, marital status, level of education, and level of experience in farming was produced. The predictor variables for this objective were age, gender, marital status, level of education, source of income and level of experience in farming.

3.5.2 Objective 2: To determine factors influencing productivity among smallholder broiler producers in Vhembe District Municipality

There is a need for smallholder broiler producers to strive and improve their technical efficiency (TE), this is necessary since the world needs to improve its diet since the onset of Covid-19 pandemic. TE is the degree to which output is maximized for a given level of input, it is the degree to which the actual output of production approaches maximum. This stochastic frontier analysis allows for differentiation between random error and inefficiency components, the inefficiency components is being subtracted for the random noise because the goal of TE is to maximize output. Aigner et al. (2000) pointed that the Cobb Douglas production function had an advantage over the trans-log hence it is efficient for inputs modelling due to its ability to take care of multi-collinearity and heteroscedasticity.

General Stochastic Frontier Production Function:

$Yi = f(Xi; \beta) \exp(Vi - Ui), i = 1, 2, \ldots n$ ……

Where: Yi is maximum output obtained from the ith farm, Xi is the vector of inputs of the ith farm,

β is the vector of the unknown parameters to be estimated,

Vi is asymmetric error term that accounted for random variation in maximum output due to external factors identically distributed,

Ui is a non-negative error term that represents a stochastic frontier shortfall from optimum output.

TE gives an insight to the current state of pandemic in the ith firm. The level of TE is affected by factors associated with management: gender, age, farming experience, disabilities, land access, transport, extension services and output market.

TE is defined in terms of observed output (Yi) to expected output (Y*) as:

Socio-economic characteristics of farmers to explain technical inefficiency and co-efficient and unknown parameters to be estimated:

Y= Stock density

X1= Labour

X2= Feeds

X3= Vaccination

X4= Actual land size

3.5.3. Objective 3: To analyse the economic impact of COVID-19 on smallholder broiler producers in Vhembe District Municipality

Objective was addressed using Microsoft Excel by calculating the average mean to get the extent of the covid-19 pandemic on smallholder broiler producers. Excel PivotTables are considered to be significant to many fields and it is well known for its ability to analyse numerical data in detail and answer unanticipated questions about

data (Ragland and Ramachandran, 2014). PivotTables enable users to summarize and group large datasets into condensed reports in a variety of ways.

For the Purpose of this study, PivotTable analysis was used to determine the score mean to be able to determine the extent of the impact of the pandemic on smallholder broiler producers.

3.5.4 Objective 4: To assess the support services provided by the government to smallholder broiler producers in Vhembe District Municipality

The randomly selected group of smallholder broiler producers provided the researcher with responses (data) of assessing the support services they require. In content analysis, information is systematically arranged by organising it into categories to discover similarities and comparisons and transferred into SPSS, analysed, and interpreted using descriptive statistics.

The smallholder broiler producers were asked to scale their satisfactory level with a series of statements provided to assess the support services provided by the government. The data was then analysed using descriptive statistics and interpreted, frequencies were be provided.

Table 3. 1:Summary of research objectives, questions, data requirements and data analysis

Research Objectives	Research Questions	Data Requirements	Data Analysis
To identify and describe smallholder broiler producers based on their socio-economic and demographic characteristics	What are the socio-economic and demographic characteristics of COVID-19 on smallholder broiler producers?	• Gender, • Age • marital status, • level of • education, qualification • Experience in farming	Descriptive Statistics
To identify factors influencing productivity among smallholder broiler producers in Vhembe District Municipality	What are the factors influencing productivity among smallholder broiler producers in the study area.	• Productivity (inputs vs output)	Stochastic Frontier Production Function (SPSS)
To analyse the economic impact of COVID-19 on smallholder broiler producers	What are the economic impacts of COVID-19 on smallholder broiler producers?	Profit, productivity, time management and the number of chicks bought, and chickens sold	Microsoft Excel
To determine the support services required and provided by the government for smallholder broiler producers	What are the support services provided by the government and other stakeholders in the poultry industry for smallholder broiler producers?	Views on challenges that smallholder broiler producers need support on	Descriptive statistics

3.6 ETHICAL CONSIDERATION

Prior to data collection, the researcher requested for ethical clearance from the University of Venda's Research Ethics Committee. In adhering to other ethical principles, the researcher ensured the following:

- Obtained informed consent- Participants were provided with consent forms before participating in the study. Consent forms were in a written form and were explained orally to accommodate all affected broiler producers. Participants were told reasons for taking part in this research as well as what the research requires of them to eliminate discomfort or inconveniences that they may have.
- Protect anonymity and confidentiality- Confidentiality of the responses was ensured for the usage of this data.
- Provide the right to withdraw-The participants of this study were given an opportunity to at any stage of the research study to withdraw from the research process, they will not be pressured and forced to respond to questions.

3.7 LIMITATIONS OF THE STUDY

- Farmers in the study area were scattered, therefore it was quite difficult to reach some farmers in areas that have poor roads.
- Sampling was also a bit difficult because some farmers are not registered with the Department of Agriculture, and extension officers do not know of their existence.
- Lack of resources made it difficult to fund the project to cover a wider range.
- Other farmers were too busy, and they opted to be interviewed telephonically, which eliminate the chance of the researcher to have an engagement with them.

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter present and discussed the empirical results found when the data collected was analysed to achieve the set objectives.

4.2 OVERVIEW OF SOCIO-ECONOMIC AND DEMOGARPHIC CHARACTERISTICS OF SMALLHOLDER BROILER PRODUCERS IN THE STUDY AREA

4.2.1 Discussion of smallholder broiler producers by gender

The figure below (figure 4.1) shows the percentage of smallholder broiler producers based on their gender. The results show a bit of gender balance in the study area with (47.8% male and 52.2% female). This indicated that poultry farming in the study area is largely practised by both male and female, thus proving no gender discrimination to poultry farming. In the same context, Ngongolo et al (2021), indicated that chicken production is a vital economic enterprise for both male and female genders because of the benefits and the speedier manner to earn income by converting input resources within a short period.

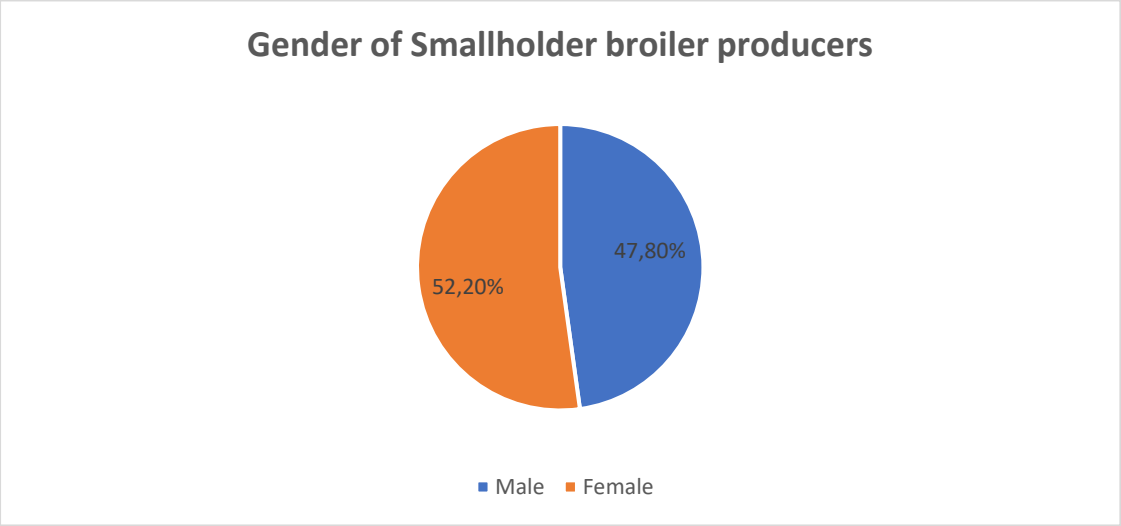

Figure 4. 1: Gender of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.2.2 Discussion of smallholder broiler producers by age

Out of the 180 smallholder broiler producers in the study area, 11.1% were of the ages between 26 and 35, 41.1%, which consisted of majority of farmers, were of the ages between 36 and 45, 33.3% were between 46 and 55, 12.8% were between 56 and 65 and 1.7% were over the age of 66 years. Okoli et al. (2004) found out that majority of smallholder broiler producers at 70.92% are between the ages of 31 and 50, backing the fact that producers who are fully involved in broiler production are the ones who are still active enough to facilitate the production. This result further indicated that middle age people are now more involved and interested in exploring business opportunities in poultry as opposed to the popular opinion that agriculture is mostly practised by elderly people. This may be due to the perception around profitability in the poultry farming compared to crop farming.

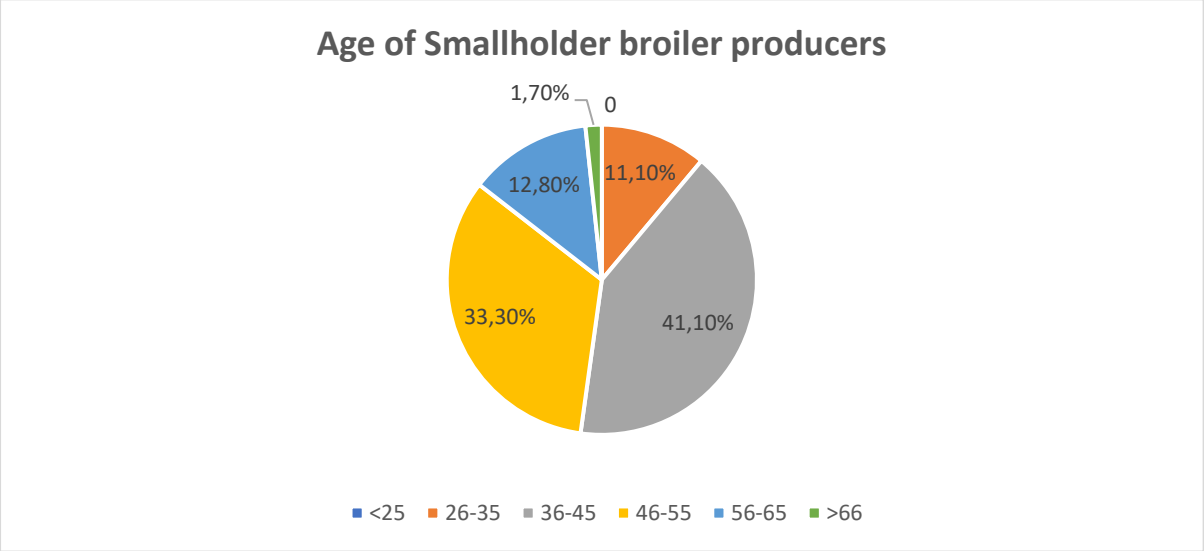

Figure 4. 2: Age of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.2.3 Discussion of smallholder broiler producers by marital status

Smallholder broiler producers who were found to be single constituted 47.8%, followed by smallholder broiler producers who were married at 40.6%, 6.1% of smallholder broiler producers were found to be widowed and 5.6% of smallholder broiler producers were found to be divorced. Evidence indicates that a farmer living with a partner is most likely to work for longer hours than those married but living alone.

Married farmers seem to lose their decision-making ability with shared responsibilities as most of the decisions are jointly made (World bank, 2017).

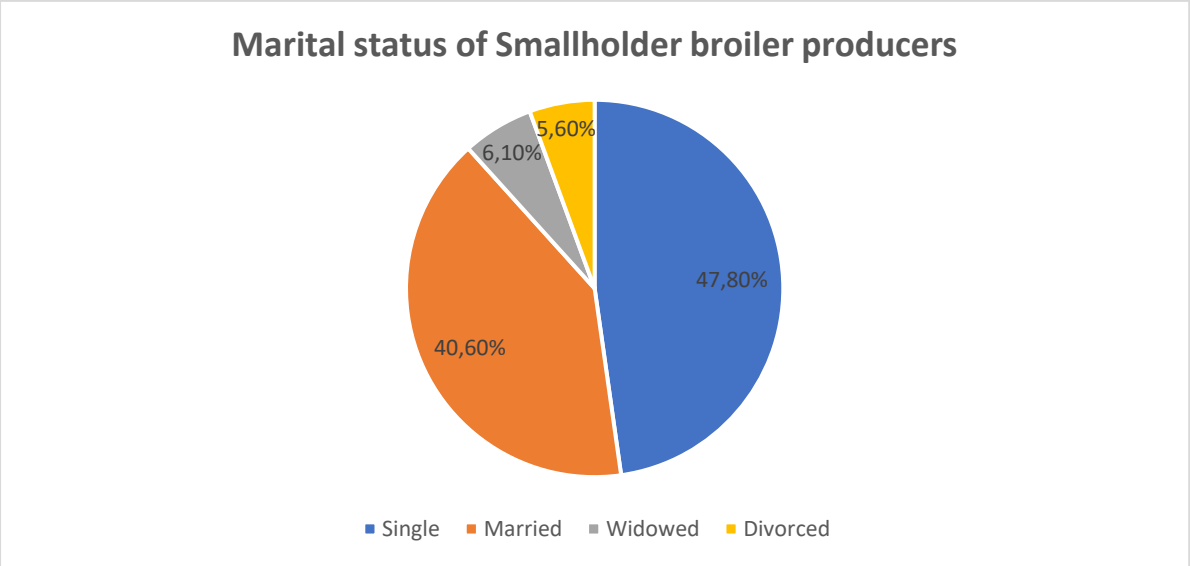

Figure 4. 3: Marital status of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.2.4 Discussion of smallholder broiler producers by farming experience

The results of the study found that Smallholder broiler producers with farming experience between 2 and 5 years constituted 41.7%, followed by smallholder broiler producers with 6 to 9 years of experience at 49.4%. The smallest group of smallholder broiler producers at 8.9% were having over 10 years of experience in broiler production.

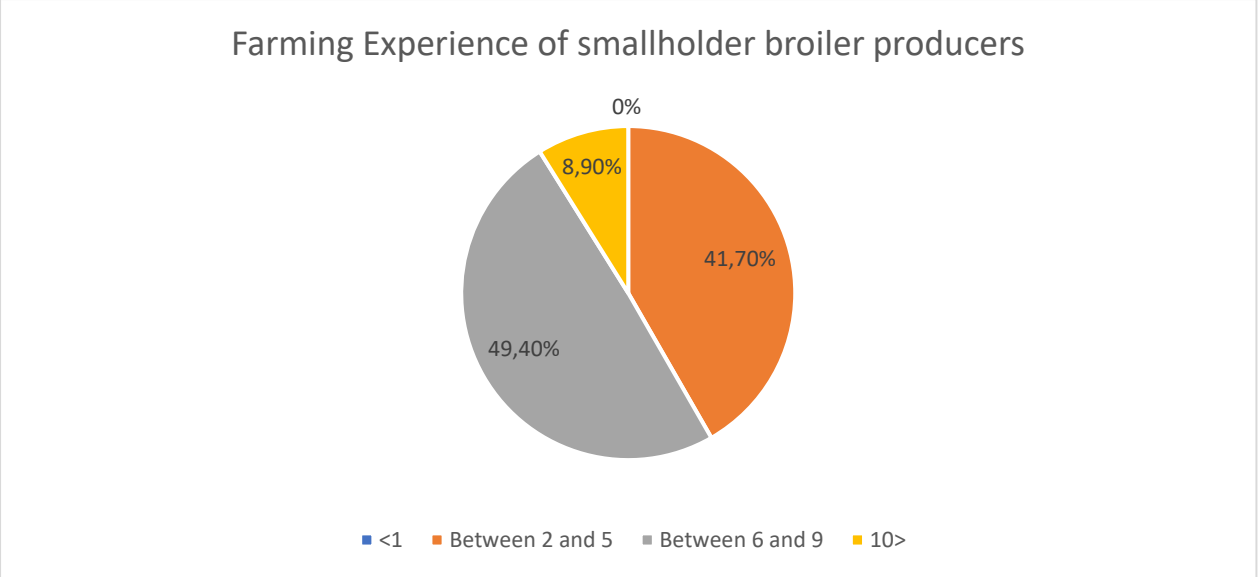

Figure 4. 4: Farming Experience of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.2.5 Discussion of smallholder broiler producers by level of education

At 43.1%, majority of smallholder broiler producers in the study area were found to have attended school until secondary level. Smallholder broiler producers with primary education constituted 40.6% of the respondents in the study area. Smallholder broiler producers with tertiary level of education were found to be 11.7%. and only 1.7% of the sample size had no formal education. The 43.1% indicates that majority of the smallholder broiler producers in the study area lack some form of proper formal education. This agrees with the study by Ngongolo et al. (2021), which indicates that most broiler producers have an elementary education and rely on their products for income.

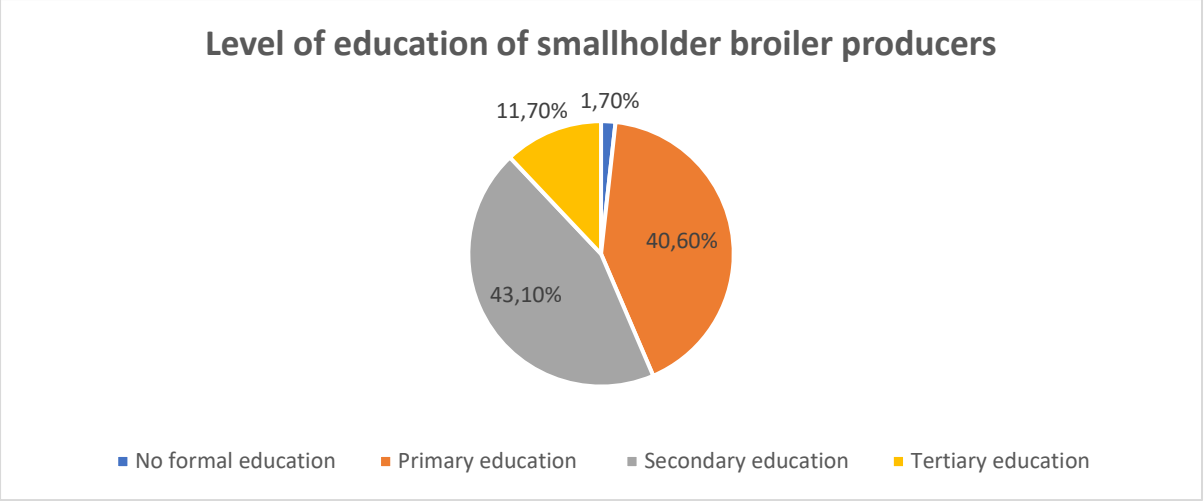

Figure 4. 5: Level of education of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.2.6 Discussion of smallholder broiler producers by household size

At 51.1%, the results indicate the majority of smallholder broiler producers who had household size of between 6 to 9 members. Smallholder broiler production usually does not require too much labour; hence these household members offer their efforts without wages, thus cutting cost and increasing profitability in the production. The smallest group of smallholder broiler producers at 6.1% had household size of over 10 members. The remaining 42.2% of the broiler producers had household size of less than 5 members. Family size plays a significant role in farming, and most farmers rely primarily on family labour for farming.

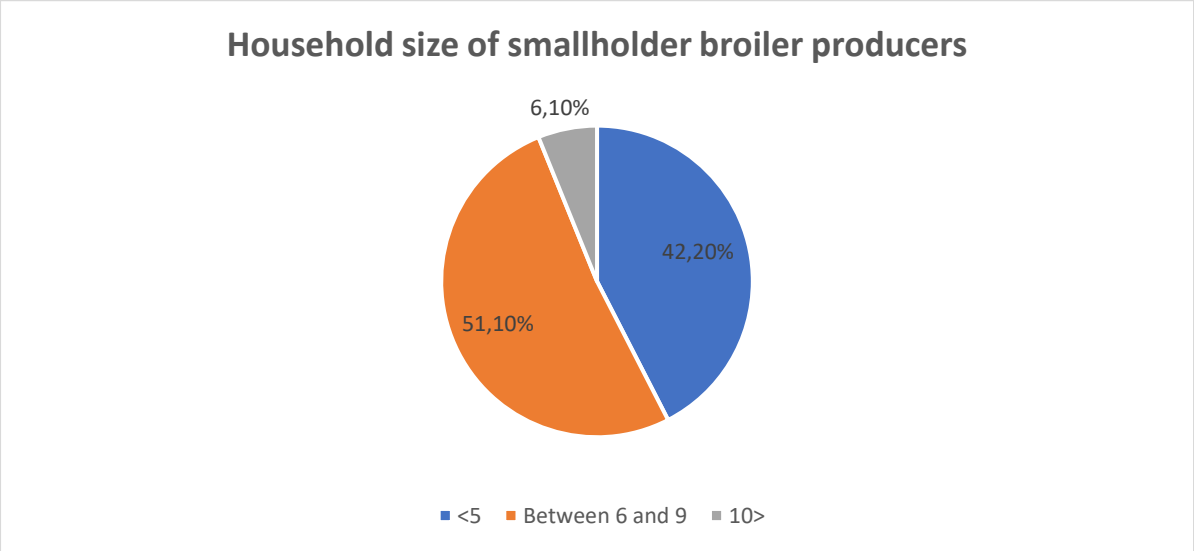

Figure 4. 6: Household size of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.2.7 Discussion of smallholder broiler producers by source of income

The smallest group in the study area which constituted just 3.9% was found to be fully depending on the social grant, whilst the largest group with 88.3% were fully depending on the income received from broilers. Smallholder broiler producers constituting 7.8% had other sources of income such as off-farm informal employment as well as hawker.

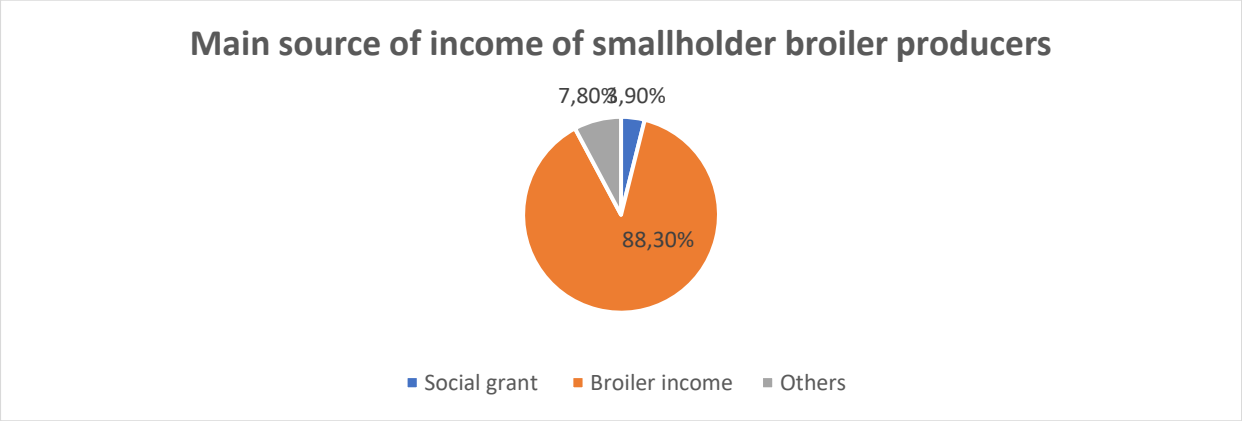

Figure 4. 7: Main source of income of smallholder broiler producers

Source: Computed from survey data (2022/2023)

4.3 DISCUSSION ON FACTORS INFLUENCING PRODUCTIVITY AMONG SMALLHOLDER BROILER PRODUCERS

4.3.1 Stochastic Frontier Production Function results

Productivity of smallholder broiler producers in Vhembe District Municipality was determined using stochastic frontier production function given a specific set of variables. The variables were; labour, feeds, vaccinations and land size. The findings are summarized in Table 4.1.

Labour

The results of the study discovered that labour has a positive relationship with the productivity of farmers in their broiler production. This relationship was found to be

statistically significant at 1% significance level. The production elasticity coefficient 0.398 explains that an increase in labour by one man power may lead to an increase in broiler output by 0.398. The results are an indication that the more labour is available, the more broiler output would be produced. The findings of this study were supported by the findings of a study by Ohajianya et al (2013), which found that labour significantly influenced productivity at 1% significant level.

Feeds

With a significance level of 1% and coefficient of 0.352, the results of this study found that when feeds are increased by at least 1 kilogram, the broiler output may increase by 0.352. This indicates that smallholder broiler producers in Vhembe District Municipality had efficient utilization and useage of the feeds. A study conducted by Adedeji et al (2013), discovered that one of the main inputs that has a significant effect on the productivity of broiler farmers is feeds.

Vaccines

Vaccines are one of the major and essential inputs for an increased productivity in broiler production. The more smallholder broiler producers spent on vaccines, the less the efficiency. The negative relationship between vaccines and technical inefficiency is an indication that vaccines are part of the production process but the more producers spent on them, the profit lessens. Vaccines were found to be statistically significant and 5% level with an elasticity coefficient of -0.108. These findings were disagreeing with the findings by Ohajianya et al (2013), which established that drugs and medication have a positive correlation with the output produced.

Land size

The outcomes of the study revealed a negative correlation between the size of land owned by smallholder broiler producers and their overall productivity. The calculated production elasticity coefficient value of -0.014 signifies that a reduction in land size by 0.014 hectares would lead to a corresponding productivity increase of 0.0360. This phenomenon can be attributed to the distinct nature of broiler production compared to crop farming. In the context of broiler production, even a smaller area of land has the potential to accommodate multiple structures with substantial holding capacities. This factor is conducive to optimizing the utilization of limited land space for raising broilers.

The implications drawn from these findings suggest that the size of the land plot does not wield a substantial impact on the output of broiler production.

Table 4 1: Estimated stochastic Frontier Production Function for smallholder broiler producers.

Variable	Coefficient	Standard error	P values
Labour	0.398	0.074	0.000***
Feeds	0.352	0.054	0.000***
Vaccinations	-0.108	0.059	0.067**
Land size	-0.014	0.016	0.360
Constant	0.672	0.512	0.190

Note: ***, **, * represents 1%, 5% and 10% significance levels respectively.

Log likelihood = -34.137152 **Number of observations=180**

Wald chi2 (4) =115083 **Prob>chi2=0.0000**

Source: Computed from survey data (2022/2023)

4.3.2 Determinants of technical efficiency in broiler production

The results of the determinants of technical efficiency are presented in Table 4.2 below. The results shows that farming experience and access to extension services were found to be statistically significant at similar levels of significance.

Farming experience

The experience of farmers was found to be statistically significant at 10% significance level with a production coefficient of 0.002. These findings indicates a positive relationship between the experience of smallholder broiler producers and broiler output, and ultimately technical efficiency. The results of the study show that smallholder broiler producers with more experience tends to have greater output as compared to those with less experience. Farmers with more experience have an advantage in cases of emergency and are in a better position to develop coping strategies than farmers with less experience. The results of this study were contrary to the findings by Alrwis and Francis (2010), who discovered that experience has a positive relationship with technical inefficiency. This indicates that as the number of years a farmer has in farming increases, the output of his farm increases.

Table 4 2: Sources of technical efficiency in smallholder broiler producers

Variable	Coefficient	Standard error	Z	P values
Gender	-0.001	0.001	-0.65	0.517
Age	-0.001	0.000	-0.77	0.440
Farming experience	0.002	0.001	1.59	0.112*
Disabilities	-0.002	0.003	-0.87	0.386
Transport	-0.002	0.002	-0.78	0.434
Extension services	0.002	0.001	1.35	0.176
Output market	-0.003	0.006	-0.53	0.596
Constant	0.954	0.007	145.52	0.000

Note: ***, **, * represents 1%, 5% and 10% significance levels respectively.

Log likelihood = -546.505 **Number of obs =180**

Wald chi2 (7) **Prob> chi2 = 0.06761**

Source: Computed from survey data (2022/2023)

4.4. Discussion on the impact of Covid-19 on smallholder broiler producers

This section was designed to address objective three of the study, which analysed the economic impact of COVID-19 on smallholder broiler producers. Five variables were used to measure the impact and they include changes in prices and stocking density both assessed in terms of before and after the pandemic. The rest of the variables (lockdown implementation, market and production) were assessed in terms of Likert-type scale measurements. The Likert-type scale questions were asked in a negative form.

Variable lockdown implementation was assessed using three statements measured with Likert-type scale, where zero equals strongly agree and four equals strongly disagree. Variable market had one item with Likert-scale ranging from strongly agree equals zero and strongly disagree equals four. Production was assessed by three statement items with Likert-scale ranging from strongly agree equals zero and strongly disagree equals four.

The findings for lockdown implementation revealed a mean score of 0.97, indicating that the smallholder broiler producers strongly agreed that they were negatively affected by the implementation of the lockdown. The mean score for variable market was 0.91, also suggesting that smallholder broiler producers in the study area strongly

agreed that their cashflow was affected due to changes in the market. For variable production, the findings revealed a mean score of 0.91, implying that the smallholder broiler producers strongly agreed that their production was negatively affected due to changes in input prices.

Table 4 3:Results on the impact of Covid-19 on smallholder broiler producers using Likert-type scale statements

Estimates	Lockdown Implementation	Market	Production
Mean	0,97	0,91	0,91
Standard Deviation	0,44	0,29	0,38
Minimum	0,00	0,00	0,00
Maximum	2,00	1,00	2,33
Count	180	180	180

Source: Computed from survey data (2022/2023)

4.4.2 Discussion of the impact of Covid-19 on smallholder broiler producers by Price changes

The results below indicate the mean score of producers' access to market. The study found that 98% of the respondents experienced a decrease in the selling prices even though they had access to output market. When curfews, lockdowns, and movement restrictions were put in place during the pandemic, there was limited access for most smallholder broiler producers to trade at the markets or hawk along the highways. This study also uncovered that during the pandemic, 85% of farmers who sells their birds to the informal market were unable to make profits.

Table 4 4: Results on the impact of Covid-19 on smallholder broiler producers by price changes

Variable	Category	Price changes	
		N	Percentage
Access to market	no	-22,5	1,26%
	Yes	-19,8	98,74%
	Total	-19,86	100,00%

Variable	Category	Price	
		N	percentage
Type of market	Informal market	-20,03	85%
	Retail store	-17,86	7%
	Food service	-20,00	8%
	Total	-19,86	100,00%

Source: Computed from survey data (2022/2023)

4.4.3 Discussion of the impact of Covid-19 on smallholder broiler producers by stocking density

The table below presents results for analysis of the impact of COVID-19 pandemic on smallholder broiler producers on stocking density by looking at socio-economic characteristics of smallholder broiler producers in the study area. The characteristics were gender, age and number of broiler houses.

The results indicated that an average female producer had reduced stocking density by 32 birds, whereas an average male producer had reduced stocking density by 23 birds. From this it can be concluded that in terms of gender, females were affected by the pandemic more than males.

When it comes to age, the middle age group constituting 61% seems to be the age with more smallholder broiler producers who were affected by the pandemic. From the results it can be concluded that more support needs to be directed to this group.

Table 4 5: Results on the impact of Covid-19 on smallholder broiler producers on stocking density

Variable	Category	Stocking density	
		N	Percentage
Gender	male	23,26	40%
	female	32,98	60%
	total	28,33	100,00%
Age	26-35	15,00	6%
	36-45	41,89	61%
	46-55	13,33	16%
	56-65	34,78	16%
	>66	33,33	2%
	total	28.33	100%
Number of broiler houses	1 house	13.79	15%
	2-5 houses	28.95	64%
	>5houses	125.0	19%

Source: Computed from survey data (2022/2023)

4.4.4 Discussion of the extent of the impact of Covid-19 on smallholder broiler producers

A series of statements were devised to determine the degree to which the pandemic affected farm production and operations of smallholder broiler producers in Vhembe

District Municipality.The statements were asked as follows: Very serious impact: leading to serious difficulties in business operations and bankruptcy, Moderate impact: operations barely maintained, small impact: some difficulties in business operations but overall stability, no significant impact, Positive impact: providing new opportunities for developments.

A significant number of farmers accumulating 67.2% indicated that due to the pandemic, the operations were barely maintained and they were affected moderately by the pandemic. Followed by smallholder broiler producers accounting 17,8% indicating that the impact was very serious leading to serious difficulties in business operations and bankruptcy. And 15% of smallholder broiler producers indicated that the impact of the pandemic was not so great, though there were some difficulties in business operations there was an overall stability.

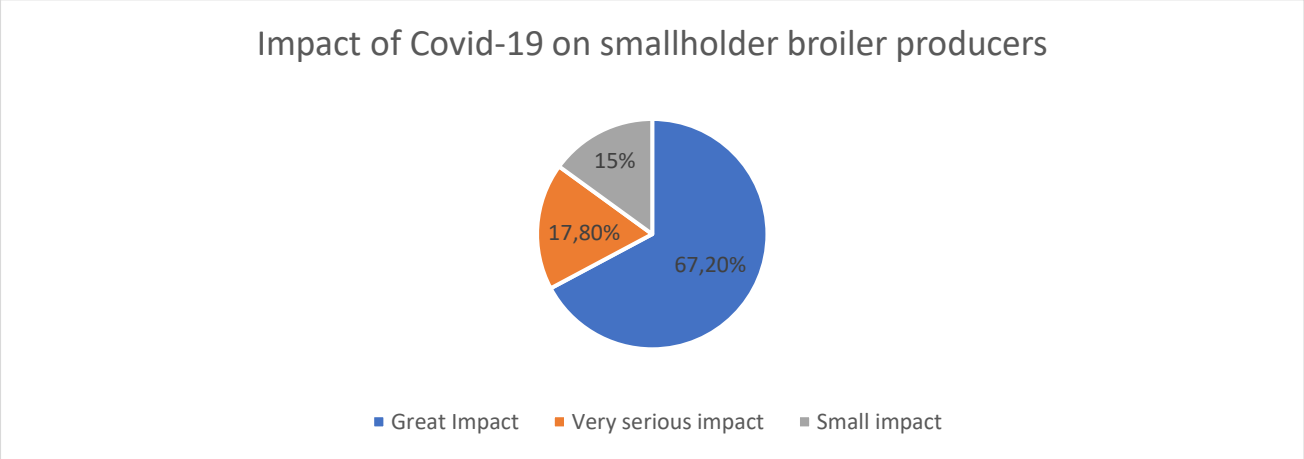

Figure 4. 8: Impact of Covid-19 on smallholder broiler producers

Source: computed from survey data (2022/2023)

This study further wanted to find if access to transport also had an impact on the extent to which smallholder broiler producers were affected by the pandemic. Out of those who had access to transport, it was further probed to find out what type of transport did the smallholder broiler producers had.

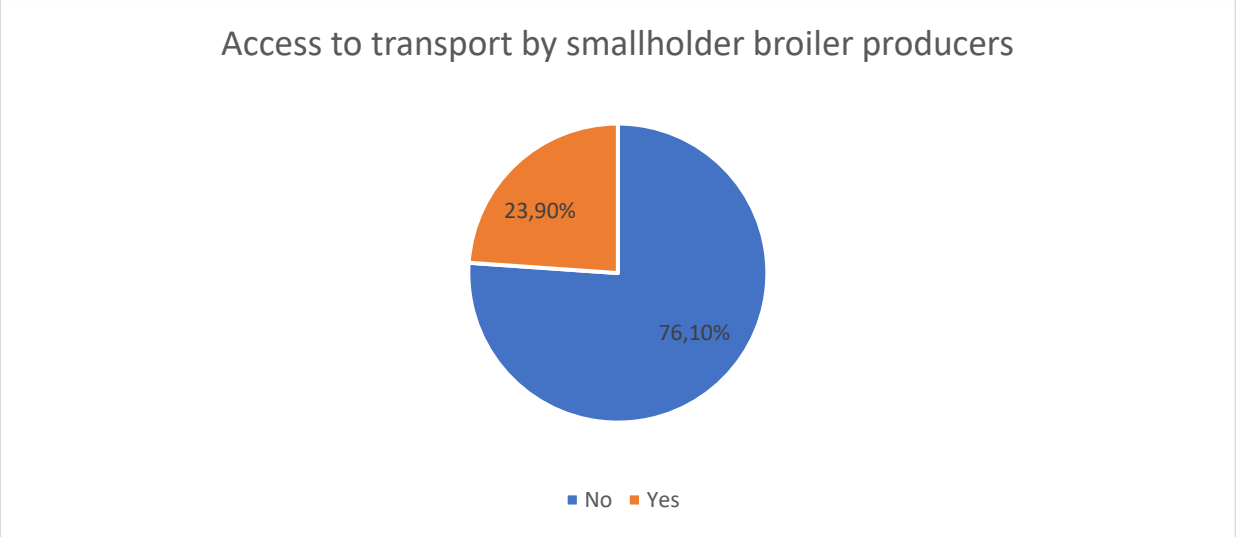

Figure 4. 9: Access to transport by smallholder broiler producers

Source: computed from survey data (2022/2023)

Majority of the respondents at 76.1% indicated that they did not have access transport whereas 23.9% of the respondents had access to transport. Smallholder broiler producers who have access to transport are more likely perform better than farmers without transport and the impact of the pandemic is minimal on them. The results therefore can be ascribed to the fact that most of these farmers are situated in rural areas where the need for a transport for marketing purpose is not essential.

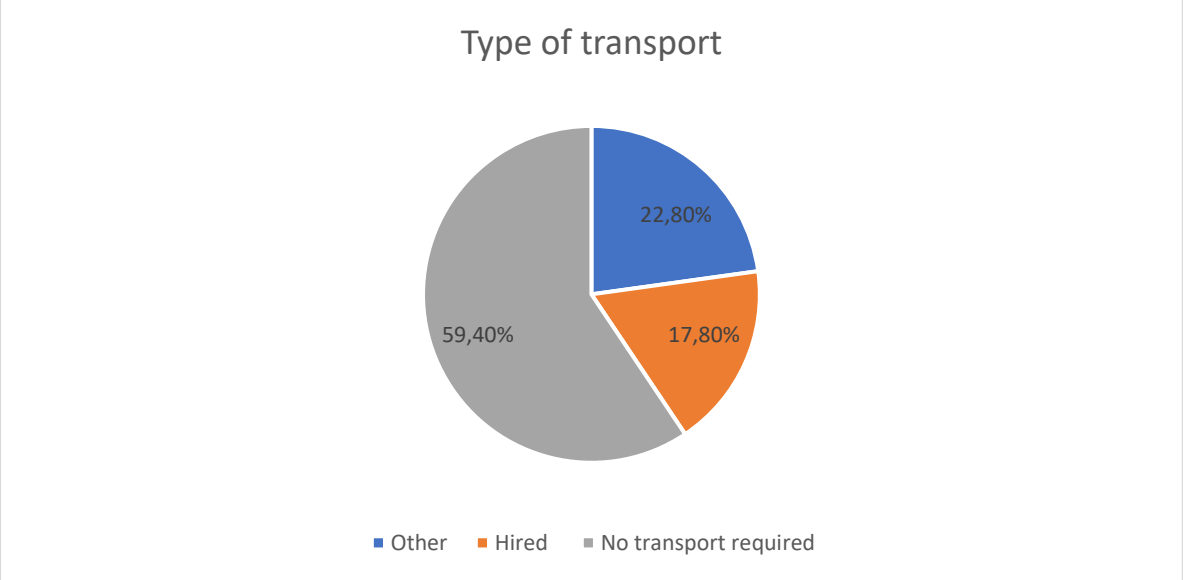

Figure 4. 10: Type of transport accessed by smallholder broiler producers

Source: computed from survey data (2022/2023)

Out of the 180 smallholder broiler producers that were interviewed, 59.40% of them indicated that there is no need for a transport in their production since they would just sell to local community members. Smallholder broiler producers who do not own transport but require it in their production constituted 17.8%. This category comprised of farmers who use hired transport. Lastly, 22.8% comprised of smallholder broiler producers who allowed their customers to collect the broilers by themselves.

4.4.5 Discussion on the Perceptions regarding the impact of Covid-19 on smallholder broiler producers.

The study sought farmers' perceptions regarding the impact of the COVID-19 pandemic on smallholder broiler producers. Eight statements were used to measure the perceptions of the sampled farmers. For most of the statements, the respondents were perceived to agree with them. However, there were some statements in which farmers were neutral. Only two farmers disagreed with some of the perceptions of the researcher. The statements were designed using the Likert scale, a psychometric scale commonly used in research that employs questionnaires as a survey instrument. The frequencies are shown in Table 4.6 below.

Table 4 6: Perceptions regarding the economic impact of COVID-19 on smallholder broiler producers

Statement (n=180)	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Long distance from farm to market was a challenge during lockdown	11.7% (21)	85.6% (154)	2.8% (5)	-	-
The lockdown implemented affected the day to day running of a business negatively	15.6% (28)	84.4% (152)	-	-	-
Government should have not implemented the lockdown	11.1% (20)	63.9% (115)	24.4% (44)	0.6% (1)	-
There were changes in the market that affected the cashflow	8.9% (16)	91.1% (164)	-	-	-
The production rate decreased due to increase in input prices	16.7% (30)	77.2% (139)	5.6% (10)	0.6% (1)	-
The production rate decreased due to insufficient income to buy inputs and hire labour	11.1% (20)	81.7% (147)	7.2% (13)	-	-
I encountered a decrease in sales	12.2% (22)	87.2% (157)	0.6% (1)	-	-
I could not get chicks on time and thus affected my production	7.2% (13)	89.4% (161)	3.3% (6)	-	-

Source: Computed from survey data (2022/2023)

4.5 ASSESSMENT OF THE SUPPORT SERVICES PROVIDED BY THE GOVERNMENT TO SMALLHOLDER BROILER PRODUCERS

Below are the descriptive results which assessed the support services provided by the government to smallholder broiler producers in the study.

The study assessed the support services provided by the government to smallholder broiler producers by asking them if they had access to extension services, what type of extension services provided and if they have received COVID-19 relief grant. The results presented below by the pie chart indicates that 63.3% of smallholder farmers did not have access to extension services whereas 36.7% had access to extension services.

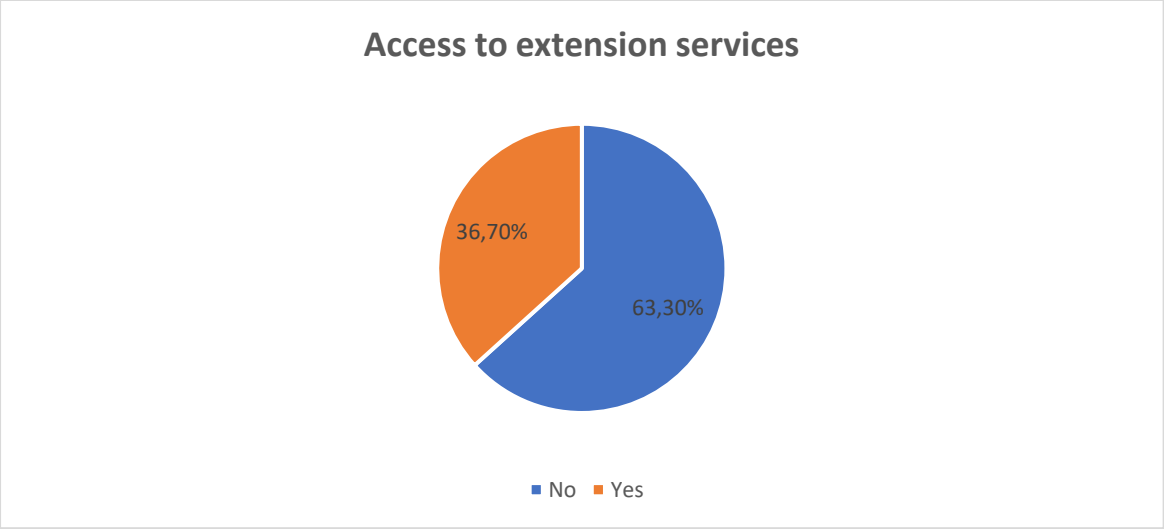

Figure 4. 11: Access to extension services

Source: computed by survey data (2022/2023)

As indicated in Figure 4.11, the results indicated that out of the 36.7% of the respondents who had access to extension services, 9.4 % of the smallholder broiler producers indicated that they received training and 27.2% indicated that they received support through provision of information.

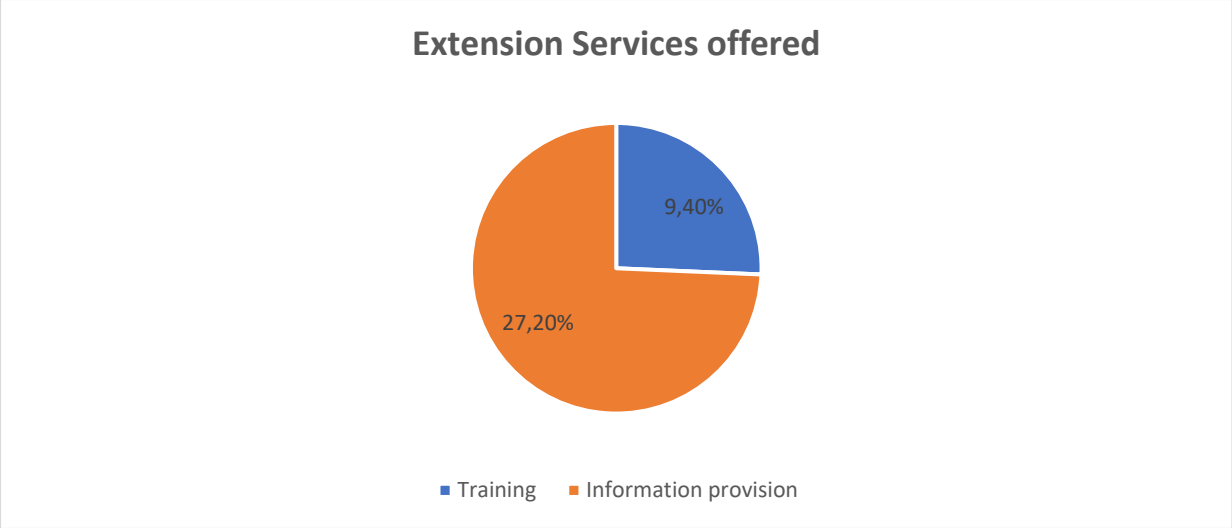

Figure 4. 12: Extension services offered

Source: computed by survey data (2022/2023)

During the pandemic, the South African government through the Department of Trade, Industry and Competition (dtic) called upon black owned businesses to apply for grants to assist small businesses to cope with adverse effects of COVID-19 pandemic. This study assessed if smallholder broiler producers had benefited from the grants that were specifically designed to assist small-scale businesses. Out of the 180 smallholder broiler producers, only 39,40% received the grants while 60,60% unfortunately did not receive the grants. Smallholder broiler producers who did not receive grants indicated that they were either not aware of the available funds or their applications were unsuccessful.

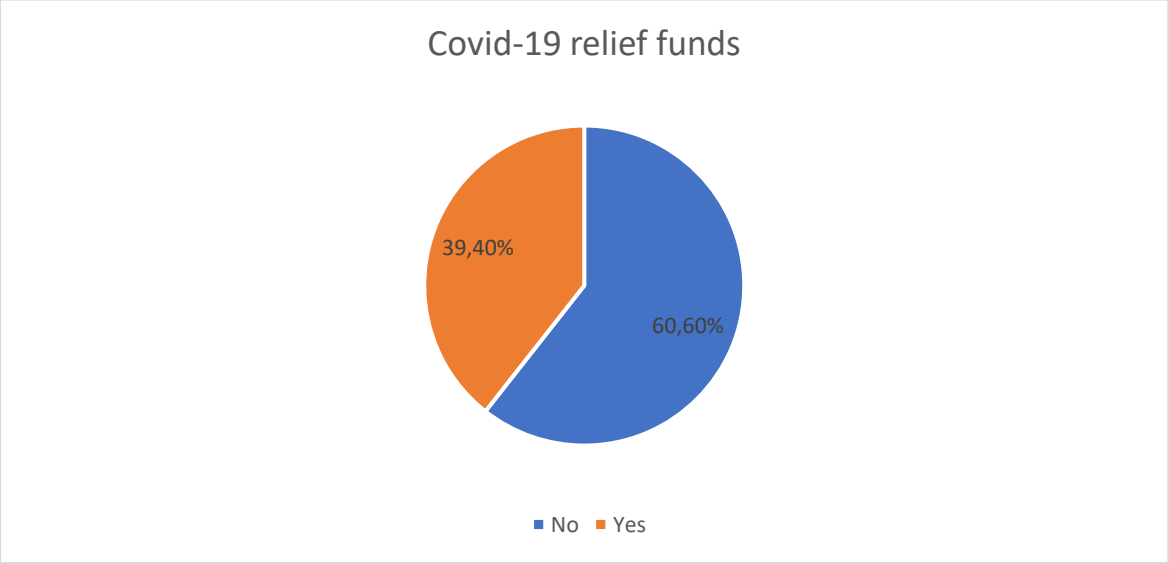

Figure 4. 13: Covid-19 relief grants provided by the government

Source: computed by from survey data (2022/2023)

4.5 CHAPTER SUMMARY

The chapter showed the socio-economic results obtained from the study and the factors affecting the smallholder broiler producer's productivity in broiler production. The chapter further presented the impact of the pandemic on smallholder broiler producers. The support services provided by the government were highlighted and discussed in this chapter.

CHAPTER FIVE
SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.1 INTRODUCTION

This chapter summarized the study, indicating the conclusions drawn from the results of the study. This chapter further discussed the policy recommendations that would be suitable for smallholder broiler production in Vhembe district Municipality.

5.2 SUMMARY OF FINDINGS

The world witnessed a significant disruption in economic activities due to the outbreak of the COVID-19. While the full economic consequences of pandemic may not be fully known, economic data shows some significant movement in global economic activities as a result of the pandemic. An assessment of its economic impact on smallholder broiler producers in Vhembe District Municipality was deemed important.

Regarding the socio-economic characteristics of farmers, the results revealed that most producers were females, and between the ages of 36 to 45 years. The study also revealed that majority of producers were single and had secondary education. The study discussed the impact of COVID-19 on smallholder broiler producers. The impact was found to have negatively affected the operations and productions of the smallholder broiler producers. The impact was assessed by also looking at the smallholder broiler producers age, gender, farming experience, marital status and level of education.

Pertaining age of smallholder broiler producers, the study revealed that the middle age group were more affected by the pandemic. When it comes to farming experience, the study found that farmers with more experience were less impacted relative to those with less farming experience. This may be ascribed to the fact that farmers with more farming experience are used to the process and they have developed better coping strategies.

The aim of the study was to analyse the economic impact of COVID-19 on smallholder broiler producers in Vhembe District Municipality of Limpopo Province in South Africa. The objectives of the study were to identify and describe smallholder broiler producers in Vhembe District based on their socio-economic and demographic characteristics,

to analyse the economic impact of COVID-19 on smallholder broiler producers, and lastly, to assess support service provided by the government and other stakeholders to smallholder broiler producers.

With respect to the support services provided by the government to smallholder broiler, the study revealed that there are support services which are provided by the government in a form of information provision, training and funding. However, the distribution and provision of extension services was found to be ineffective, this led to a higher number of smallholder broiler producers being impacted by the pandemic due to lack of information which could have been easily passed on by an extension officer.

5.3 CONCLUSION

The study identified the impact of COVID-19 pandemic on smallholder broiler producers in Vhembe District Municipality and further discussed its effect on rural livelihoods. The study results are based on the existing baseline research on smallholder broiler producers in the study area and are important for developing appropriate interventions in the post-COVID-19 era. The main objective of this study was to analyse the economic impact of COVID-19 on smallholder broiler producers in Vhembe District Municipality. The study intended to respond to three specific research questions. The study uncovered that smallholder broiler producers in Vhembe District Municipality were greatly impacted economically by the implementation of lockdown during the pandemic.

First the study intended to determine and identify socio-economic characteristics, the predictor variables of the said characteristics were level of education, and age group of farmers and gender of farmers. Regarding the age group of farmers, the results revealed that the dominant age group was between 36 and 45 of age. While most farmers within the study sample had achieved secondary education. The study also discovered that Vhembe district municipality has got gender balance of smallholder broiler producers. The study also aimed to analyse the impact of COVID-19 on smallholder broiler producers in the study area. The impact of the pandemic was identified through decreased income, perception of smallholder broiler producers on the extent of the impact, stocking density and decreased income.

The study also sought to assess the support services provided by the government to smallholder broiler producers in the study area during the pandemic. The study uncovered that, through extension services, farmers are receiving support services through information provision and training. However, a very little percentage of farmers had access to extension officers which led to them missing out on the support services provided by the government. Furthermore, the study also found that in an attempt to assist smallholder broiler producers in the study area, the government provided covid-19 social relief funds to smallholder broiler producers to help their businesses float during and post the pandemic. The challenge was that a small percentage of the respondents were able to receive the funds. Those who were unable to receive the grants indicated that they had no information about those funds. This led to a conclusion of the study to say that a different method of administering extension should be explored to ensure effective provision of such services.

5.4 RECOMMENDATIONS

On the basis of the study findings, the following recommendations were made:

- There is a need for a partnership between relevant stakeholders such as SAPA, AFMA etc. to come up with low-cost feed ingredients so that smallholder farmers can afford to buy them and still make profit. Farmers should also be encouraged on working as a group as this will assist in getting inputs in bulk and at a discount rate.
- The government can encourage the provision of support services by private sectors and non-governmental organizations (NGOs) that will put emphasis on supporting and growing small business owned by females.
- Farmers needs to be assisted with securing stock which is equivalent to their production capacity.
- Farmers should be given feeds and vaccines subsides to allow them to spend less on production inputs for their broiler production.
- A different method of administering extension services should be explored to ensure effective provision of such services. This recommendation was made based on the findings which indicated that a small proportion of smallholder broiler producers in the study area had access to extension services and majority of producers did not benefit from the funds due to lack of information.

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APPENDIX A: LETTER OF CONSENT FOR RESPONDENTS

My name is Khodani Madula. I am a student doing Master of Science in Agriculture (AGMAAE) in the Department of Agricultural Economics and Agribusiness at the University of Venda. I am conducting research on Economic Analysis of the Impact of Covid-19 on smallholder broiler producers in Vhembe District Municipality, Limpopo Province, South Africa.

You have been selected to participate in this study because you are one of the smallholder broiler producers. You will unfortunately not benefit from your participation as an individual; however, it is envisioned that your participation and findings of this study will contribute towards ensuring a sustainable agriculture.

This research is for academic purposes only and by participating in this study, you agree that this information may be used for this research purpose including dissemination through research report, publications, and conferences.

Your participation is voluntary, and you can withdraw at any time without penalty. Your responses will be kept confidential. By completing the survey, you indicate that you voluntarily participate in this research.

For further information, you may contact my supervisor, Prof I.B Oluwatayo on the

following numbers:

Cell number: 078 449 3162

Office number: 015 962 9373

....

Signature of respondent Date

APPENDIX B: CONFLICT OF INTEREST

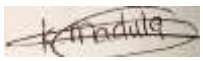
CONFLICT OF INTEREST

Conflict of interest is when an individual's private or personal interests and professional obligations are divergent to such an extent that an independent observer may have doubt as to whether or not the individual's professional actions are influenced by personal considerations, financial or otherwise.

I, Khodani Madula (Staff / student number: 16011139) would like to disclose the following conflict of interests:

Indicate YES or NO and state the nature of the conflict and explain how it will affect the integrity of the research.

There is a conflict of interest due to either myself or a close family member benefiting in terms of:	**YES**	**NO**
Funds or research sponsorship Explain:		NO
Use of UNIVEN facilities Explain:		NO
Purchasing of major equipment by the University for this project		NO
Delay of dissemination of the results resulting in benefit Explain:		NO
Discounts or concessions Explain:		NO
Employment Explain:		NO
Other Explain:		NONE



Principal Investigator/Researcher

23 August 2022

Date

APPENDIX C: CONSENT FORM

University of Venda

Topic: Economic Analysis of the Impact of Covid-19 on smallholder broiler producers in Vhembe District Municipality, Limpopo Province, South Africa.

The consent form is designed to check that you understand the purposes of the study, you are aware of your rights as a participant and to confirm that you are willing to take part.

Please, put a cross if the following statements are false, and a tick if the statements are true.

The nature of the study has been described to me.

I understand that I am free to refuse to take part if I wish.

I understand that I may withdraw from the study at any time without having to provide a reason

I have received sufficient information about the study for me to decide whether to take part

I know that I can ask for further information about the study from the research team.

I understand that all information arising from the study will be treated as confidential.

I know that it will not be possible to identify any individual respondent in the study report, including myself.

I agree to take part in the study

Name: .....

Date: .....

Signature: .....

APPENDIX D: APPROVAL FROM UHDC

UNIVERSITY OF VENDA

OFFICE OF THE DVC: RESEARCH AND POSTGRADUATE STUDIES

TO : MR/MS K. MADULA

FACULTY OF SCIENCES, ENGINEERING AND AGRICULTURE

FROM: PROF. N.N FEZA

DVC: RESEARCH AND POSTGRADUATE STUDIES

DATE : 24 JANUARY 2023

DECISIONS TAKEN BY UHDC OF 24th JANUARY 2023

Application for approval of Masters Proposal Report in the Faculty of Sciences, Engineering and Agriculture: **K. Madula (16011139)**

Topic: "Economic Analysis of the Impact of Covid-19 on Smallholder broiler producers in the Vhembe District of Limpopo Province in South Africa."

Supervisor	UNIVEN	Prof. I.B Oluwatayo
Co-supervisor	UNIVEN	Dr. M. Tshikororo

UHDC approved of Masters Proposal

PROF. N.N FEZA
DVC: RESEARCH AND POSTGRADUATE STUDIES

APPENDIX E: QUESTIONNAIRE

Topic: Economic Analysis of the Impact of Covid-19 Pandemic on smallholder broiler producers in Vhembe District Municipality of Limpopo Province in South Africa.

Dear respondent, In the face of the sudden outbreak of the coronavirus we are all concerned about the current business status. We hope that through research and accurate information, We can better advocate for businesses. This project is for scientific research purpose only. The information and data are strictly confidential, and will not be used for commercial purpose. It takes approximately 15-20 mins to complete the questionnaire. We will publish only aggregated anonymous results. This survey complies with the general data protection regulation. Your contribution is highly important. Thank you for your support.

Do you give consent to continue with the interview? **YES** **NO**

General information

Questionnaire number……

Name of the producer…….

Signature of the producer……...

Name of the local municipality…….

Contact details…….

Date of the survey……

SECTION A: Socio-economic and demographic characteristics of smallholder broiler producers.

1. Gender

Male	
Female	

2. Age

<25	
26-35	
36-45	
46-55	
56-65	
>66	

3. Marital status

Single	
Married	
Widowed	
Divorced	

4. Home language

Tshivenda	
Tsonga	
Pedi	
Other, specify	

5. Farming experience (in years)

<1	
2-5	
6-9	
10>	

6. Level of education

No formal education	
Primary education	
Secondary education	
Tertiary education	

7. Household size

<5	
6-9	
10>	

8. Primary Occupation

Employed	
Unemployed	
Self employed	
Other, specify	

9. Source of income

Social grant	
Broiler income	
Off-farm informal employment	
hawker	
Other, specify	

10. Any disabilities

Yes (specify)	
No	

SECTION B: General Farm Information

1. Do you have access to land?

Yes	
No	

2. Type of ownership?

Rent	
Bought	
Lease	
Inherit	

Permission to occupy	
Other, specify	

3. Land size in ha? ……..
4. Do you own transport?

Yes, specify	
No	

5. If 4 is no, what do you use to transport your broilers?

Hired transport	
No required transport	
Other, specify	

6. Do you have access to electricity?

Yes	
No	

7. Do you belong to any farmers organisation?

Yes, specify	
No	

8. What are the main reasons for engaging in farming?

Income generation	
Unemployment	
Other, specify	

9. Do you have access to extension services?

Yes	
No	

10. If 9 is yes, what kind of services do they offer?

Training	
Information provision	
Other, specify	

SECTION C: Factors influencing productivity among smallholder broiler producers.

1. How much do you sell your chicken?

Before the pandemic	
After/during the pandemic	

2. How much is your stocking density?

Before the pandemic	
After/during the pandemic	

3. How many orders were cancelled due to pandemic?.....
4. How much do you pay for feeds per cycle?.....
5. How much do you pay for vaccines per cycle?.....
6. How much do you pay for labour?.....
7. How many employees did you retrench because of the pandemic?.....
8. Do you have access to broiler output market?

Yes	
No	

9. If yes, which kind of market structure do you access?

Informal market	
Fresh produce market	
Retail store	
Food service	
Export market	
Other, specify	

10. Which selling arrangements do you use?

Price taker	
Negotiate	

11. How much do you sell your product in the output market?.....

12. How many broiler houses do you have and their capacity?.....

13. What do you consider before selling your produce?

Price offered	
Market demand	
Other, specify	

SECTION D: The impact of Covid-19

1. Please choose the most significant financial problems for your business (up to 2 options)

Staff wages	
Rent	
Repayment of loans	
Payment of invoices	
Yes	
No specific problem, elaborate	

2. To what extent does the production and operations of firm been affected by this pandemic (single choice)

Very serious impact: leading to serious difficulties in business operations and bankruptcy
Great impact: operations barely maintained
Small impact: some difficulties in business operations but overall stability.
No significant impact.
Positive impact: providing new opportunities for developments.

3. What is the main operating pressure that your firm is currently facing?

Employee salaries	
Cancellation of orders	
Rent	
Other, specify	

4. Have you borrowed money for broiler production?

Yes	
No	

5. If 4 is yes, where did you borrow?

Financial institution	
Relatives	
Money lenders	
Other, specify	

6. Have you sold any assets to keep up the broiler production?

Yes, specify	
No	

7. Did you experience a decrease in farm income as a result of the pandemic?

Yes	
No	

8. What challenges do you face in your broiler production, how do you deal with them?

Challenges	Coping mechanism	Suggested solution

9. Did you receive the Covid-19 relief funds from the Government?

Yes, how much?	
No, why not?	

10. Below are number of statements regarding the impact of the Covid-19 pandemic, please read them well and indicate to what extend do you agree or disagree with each statement.

Factor	Statement	SD	D	N	A	SA
Lockdown implementation	Long distance from farm to market was a challenge during lockdown					
	The lockdown implemented affected the					

	day to day running of a business negatively					
	Government should have not implemented the lockdown					
Market	There were changes in the market that affected the cashflow					
Production	The production rate decreased due to increase in input prices					
	The production rate decreased due to insufficient income to buy inputs and hire labour					
	I encountered a decrease in sales					
	I could not get chicks on time and thus affected my production					