THE PERCEPTION OF EMERGING CATTLE FARMERS ON EXTENSION AND ADVISORY SERVICES IN IMPROVING THE WELFARE OF THEIR CATTLE IN SINTHUMULE-KUTAMA AREAS OF MAKHADO MUNICIPALITY IN VHEMBE DISTRICT, IN LIMPOPO PROVINCE.

BY

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DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF AGRICULTURAL MANAGEMENT (AGRICULTURAL EXTENSION) IN THE CENTRE FOR RURAL COMMUNITY EMPOWERMENT

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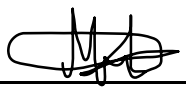
DECLARATION

I Thononda Muano declare that this dissertation titled " The perception of emerging cattle farmers on extension and advisory services in improving the welfare of their cattle in Sinthumule-Kutama areas of Makhado municipality in Vhembe district, in Limpopo province", hereby submitted to the Centre for Rural Community Empowerment, University of Limpopo for the degree of Master of Agricultural Management (Agricultural Extension) has not previously been submitted by me for a degree at this or any other university, this is my own work in design and execution, and that all materials contained herein has been duly acknowledged.

Signature:  Date: 04/04/2023

DEDICATION

I dedicate this research project to my grandparents: Mr. M.F Mathivha and Mrs. M.E Mathivha ; my mother Ms. Thizwilondi Margaret Mathivha and my Late friend Mr. Thendo Aubrey Rambau who used to encourage me to be focus on school.

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ABSTRACT

The study was carried to find out the perceptions that emerging cattle farmers hold regarding the importance of agricultural extension, the role and the impact of extension advisors in improving the welfare of their cattle in Sinthumule-Kutama areas. Primary data was collected from emerging cattle farmers of Sinthumule-Kutama areas, under Makhado municipality using questionnaires.

The target population was emerging cattle farmers of Sinthumule-Kutama areas. Simple random sampling method was used to select sixty seven (67) emerging cattle farmers from the targeted areas (18 villages) but extra 13 farmers were interviewed and the total of interviewed farmers is 80. SPSS tool was used for descriptive analysis (percentage) and the mean score to address the objectives of the study.

Majority of emerging cattle farmers were found to be older than 50 years and majority of these farmers are female. Majority of farmers had primary education as their highest qualification, however male farmers were found to be more educated than female farmers. Many of them are married, pensioners and they rely on non-farming activities for source of income.

Seven statements were used to measure perceptions of farmers towards AEAS, farmers agreed with four statements regarding their perception towards AEAS in helping them with improving their cattle welfare. Farmers agreed on statements like cattle welfare is important in farming, AEAS are important in cattle farming, they are knowledgeable about cattle welfare and methods used by extension workers are important. This shows that emerging cattle farmers of Sinthumule-Kutama regard agricultural advisors as important bodies in their cattle welfare improvement.

Results further indicated that majority of farmers are receiving services and advice from extension workers on their cattle welfare. Majority of farmers further revealed that the extension activities contribute to their knowledge of cattle welfare and that they receive the support regarding their cattle welfare from extension workers, for instance; extension workers arrange animal technicians to inject their livestock and provide medications after every season in areas and places without animal handling facilities such as crush pen. Extension workers collaborate with some of these farmer who are leaders within the community to manage cattle welfare when extension worker is not around .The results further revealed that majority of farmers rely on those

leaders as they are accessible ,they expect them to perform extension work and to vaccinate cattle during animal health emergence. Majority, here refers to half of the respondents of farmers stated that the activities held by extension workers are meetings, furthermore emerging cattle farmers of Sinthumule-Kutama are expecting to be getting medication every time not only when season changes and they are also expecting to be trained, they believe that these expected services can help them improve their cattle welfare.

Keywords: Agricultural extension and advisory services, cattle welfare, emerging cattle farmers, perception.

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LIST OF ACRONYMS

AAP: Animal and Aquaculture Production.

ABET: Adult Basic Education and Training

AEAS: Agricultural Extension and Advisory Services.

BVD: Bovine Viral Diarrhoea.

CW: Cattle Welfare.

DAFF: Department of Agriculture, Forestry and Fisheries.

DALRD: Department of Agriculture, Land and Rural Development.

EA: Extension Agent.

ECF: Emerging Cattle Farmers.

FAO: Food and Agricultural Organisation.

FAW: Farmer's Animal Welfare.

SADC: Southern Africa Development Community

SPSS : Statistical Package for the Social Sciences.

Stats SA: Statistics South Africa.

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CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 Introduction

Cattle farming are a tradition within South African rural systems. Provinces that are dominated by cattle farms include the Eastern Cape, parts of the Free State, KwaZulu-Natal, Limpopo, and the Northern Cape (Department of Agriculture, Forestry and Fisheries, 2019). This is particularly important considering that a third of livestock especially cattle in the country is owned by emerging farmers (Scholtz *et al*., 2008).

Emerging farming is one of the two distinct farming systems that has structured agriculture in Limpopo province with two systems operating namely, emerging and commercial farming system (Whitbread *et al*., 2011). According to Whitbread *et al*. (2011) two systems are both noticed to be producing similar crops and livestock, they differ markedly in the typical scale of operation, methods of production and market orientation as well as quality.

There are some factors which are limiting emerging livestock farmers from growing to commercial farming sector and poor livestock welfare is one of them. Fraser and Broom (1990) stated that “Human do not understand animals ‘preferences in terms of their health and the quality of their animal’s life”. There is a need for livestock producers to understand the welfare of their livestock because animal welfare is a science on its own right (Fraser and Broom, 1990).

In general terms, livestock welfare includes protecting animals from parasite and diseases, this can be done by vaccinating to prevent infection and by treating the infection which have been diagnosed in the farm. Welfare also emphasizes the provision of clean water to animals and essential nutrients supplements to the animals to maintain their health preferences.

Habiyaremye *et al*. (2017) reported that most of livestock farmers lose their animals through different diseases because they are unaware and not knowledgeable about those diseases; therefore, this makes them not to vaccinate and treat their animals against those different diseases. In South Africa, common animal diseases found are

Anthrax, Black quarter (black leg), Rabies (mad dog disease), Mastitis, Tick fever and listeriosis (Habiyaremye *et al*.,2017).

Diseases reported from Limpopo province are African and Asiatic red water, Heartwater, Anaplasmosis, Lumpy skin and Foot and Mouth (Bassi *et.al.,*2019). This shows that cattle need to be vaccinated to protect them from both bacterial diseases and fungal diseases. Bassi *et.al.*(2019) suggested that cattle need dipping to protect them from parasites such as flies, Ticks, Lice, Mites and Roundworms. Due to different cattle diseases reported in Limpopo province, emerging cattle farmers in this province need to be knowledgeable about their cattle welfare to obtain high production yield. Most rural households in Limpopo province were found to be poor by Madzivhandila (2015). Over 70% of rural households in Limpopo province are involved in livestock and crop farming to produce food for themselves (Madzivhandila, 2015).

Makhado Local Municipality is one of the municipalities in Limpopo province characterised by most households practicing sustainable agriculture for food production (Stats SA, 2007).These rural households are found to be lacking an access to agricultural inputs (resources) such as irrigation, which makes their crop production to highly depend fully on precipitation and they also lack resources such as money, medication, feeds which makes their livestock production to rely on natural resources (Stats SA, 2007).

According to Madzivhandila (2015), it can be concluded that food production practices of rural households in Limpopo province depend fully on nature and those farmers do not get adequate support from extension and advisory organizations. Failure in crop and livestock farming by emerging farmers will lead to food insecurity and poverty in rural communities because rural people will have to rely heavily on purchased agricultural products and rural local markets will be on shortage of those products.

One of the major challenges that South African emerging livestock farmers are faced with is lack of knowledge and skills. The lack of knowledge and skills of most emerging livestock farmers is caused by perception that farmers hold about agricultural extension and advisory services and poor access of farmers to information they need for their production because government extension officers do not support them

enough and this makes those farmers to rely heavily on government welfare grants for source of income rather than from farming (DAFF, 2019).

Van den Ban and Hawkins (1996) defined perception as the process by which individuals transform information they received from the environment into psychological awareness. Robbins *et al*. (2009) also defined perception as the process by which an individual organises and interpret sensory impression to give meaning to their environment (someone's view on something).

This study defines perception as farmer's view on agricultural extension and advisory services, this includes the contribution of agricultural extension programs to farmer's knowledge, effectiveness of the approaches used by extension agents and the importance of extension activities in improving the welfare of their cattle. This study beliefs that emerging cattle farmers do not hold the same perception towards extension and advisory services.

The perception of those who receive extension support will not be the same as of those who do not receive support from extension agents. It is assumed that farmers with positive perception will adopt modern technologies brought to them and negative perception will influence farmers to reject modern technologies introduced to farmers (Parminter and Wilson, 2003).

1.2 Problem statement

Amungwa and Nji (2015) indicated that emerging farmers have been found to face significant barriers such as inadequate delivery of government services, lack of skills, poor knowledge on farming and lack of motivation and organization as well as previous unsustainable agricultural practices. Dhaka et al. (2017) indicated that emerging cattle farmers are facing a problem in increasing their cattle products and production yield.

This might be due to lack of knowledge on how to improve their cattle welfare, lack of information regarding the improvement of their cattle welfare, having no desire to prevent unnecessary animal suffering, negative perception on agricultural extension and advisory services (AEAS). This is attributed to the fact that most of emerging farmers do not receive adequate support services from agricultural extension and advisory services from the government (Nkosi, 2017).

Therefore, agricultural extension and advisory officers' intervention can assist emerging cattle farmers to improve their livestock welfare only if the emerging farmers do not neglect the extension and advisory support since "participation in extension programme is voluntary". Farmers' interpretation of extension and advisory services can be a constraint or solution to the improvement of their cattle welfare.

Perception will promote the adoption of modern agricultural innovations (this includes information, technologies, practices, and farmers participating in extension programs) while negative perception will hinder the adoption of modern agricultural innovations (Parminter and Wilson, 2003). Therefore, it is assumed that farmers' perception influences their adoption or rejection of extension services and information.

If farmers have positive perception toward extension services, they will adopt and practice what the extension agents are advising them to practice and negative perception towards extension and advisory services will result in rejection of practices. This interpretation by farmers turn to develop into a behaviour which impact negatively on AEAS. Hence this study to assess the perception of emerging cattle farmers on extension and advisory services in improving the welfare of their cattle.

1.3 Rationale of the study

Studies have showed that farmers' perceptions and attitudes are inhibiting factors towards effective and efficient agricultural extension and advisory services delivery and to sustainable agricultural development (Nkosi, 2017 and Sebeho, 2017). According to Makapela (2017), the perception influence how individuals interpret different environments (physical and psychological) that develop behaviour. Emerging cattle farmers play an important role in agricultural growth, food production and food security since they produce food to rural people and to their families (FAO, 2012).

Despite their potential to ensure food security, food production and agricultural growth, Nkosi (2017) reported that emerging livestock farmers are known to have less resources, lack of knowledge about their livestock welfare and unaware of agricultural extension services (activities). Fraser and Broom (1990) defined livestock welfare as the protection of animals from physical and psychological sufferings (this includes protecting animals from parasite and diseases).

The reason for lacking what have been mentioned might be farmers' negative perceptions towards agricultural extension and advisory services. Emerging cattle farmer's perceptions on extension and advisory services need to be examined because Forbang *et al.* (2019) argued that perception is one of the factors that contributes to decisions that farmers take about the new agricultural innovations (technologies and knowledge) and extension programs/activities.

Assessing emerging cattle farmer's perception on extension and advisory services will then help the researcher to find out the extension approaches and strategies that farmers prefer and find out how knowledgeable emerging cattle farmers are about cattle welfare practices (whether they protect their cattle from certain diseases). This will also provide the researcher with viewpoints farmers hold regarding the importance of agricultural extension, the role and impact of extension advisors in improving their cattle welfare.

Generally, this study will provide information that will assist in concluding whether emerging cattle farmers take (view) and interpret extension and advisory services as important or not in improving their cattle welfare. The results might help the extension advisors to know about the viewpoints of emerging cattle farmers in Makhado Local Municipality on extension services and challenges they are facing in improving their cattle welfare.

Practically, agricultural advisors might become aware of farmers desires (needs) and preferences, this may help and encourage them to improve their methods and activities so that they can meet and engage with more emerging cattle farmers in their extension programs. Hence it might not only benefit extension officers and the researcher, but it may also help emerging cattle farmers to know about agricultural advisors and their role in improving cattle welfare and production yield.

Emerging cattle farmers may become aware of the extension and advisory services, their role, even the extension activities taking places in their community and the benefits of those activities in improving their cattle welfare. Therefore, if emerging cattle farmers show approximately interests in extension programs, it may permit them to know, meet and engage with other farmers who are facing the same problems with them to work as a team.

Apparently, there are studies about farmers' perception on extension and advisory services and studies about animal welfare but there are limited studies about farmers' perception and cattle welfare improvement in Limpopo province. The researcher is choosing Sinthumule-Kutama as a study area because there are a lot of emerging cattle farmers and there is no study found about perception in this study area.

It is important to conduct a study in such area as it is in rural communities and farmers from these areas might be having different views from those who are in urban. This study aims on filling the knowledge gap as it may focus on what other researchers did not manage to reveal.

1.4 Aim and Objectives.

1.4.1 Aim

This study aimed to find out the type of viewpoints emerging cattle farmers hold regarding the importance of agricultural extension, the role and the impact of extension advisors in improving the welfare of their cattle in Sinthumule-Kutama areas.

1.4.2. Objectives

Research objectives are line-up and design of the study that will lead a researcher to the aim of the study. Objectives summarize accomplishments of the research, if they are successfully addressed during the study then the aim of the study will be achieved. This study intended on addressing the following objectives:

i). To describe the socio-economic characteristics of the emerging cattle farmers in Sinthumule-Kutama areas of Makhado Local Municipality.

ii). To determine the perception of Sinthumule-Kutama emerging cattle farmers on extension and advisory services in improving the welfare of their cattle.

iii). To determine the contribution of extension activities in improving the knowledge of emerging cattle farmers on how to improve their livestock welfare in Sinthumule-Kutama areas of Makhado Local Municipality.

iv). To find out whether the emerging cattle farmers receive support from the extension advisors regarding their cattle welfare in Sinthumule-Kutama areas of Makhado Local Municipality.

1.5 Definition of concepts:

For one to understand the study, it is important to define some of the concepts attached to the study, for example, animal welfare, emerging cattle farmers, Extension and Advisory and perception.

- Animal Welfare - According to Fraser and Broom (1990), animal welfare denotes the desire to prevent unnecessary animal suffering.

- Emerging Cattle Farmers - emerging farmers are described as farmers from previously disadvantaged communities who lack technical know-how, farm and risk management skills and access to formal markets with defined off take agreements (Nkosi, 2017). According to Whitbread *et al*. (2011) subsistence and new farmers who make up the middle group to commercialize are termed emerging farmers.

- Extension and Advisory Services – consist of all different activities that provide the information and services needed and demanded by farmers and by other actors rural setting to assist them in developing their own technical, organizational, management skills and practices so that they improve their well-being and livelihood (Christoplos *et al*.,2011).

- Perception - is defined as the process by which an individual organises and interpret sensory impression to give meaning to their environment therefore in simple terms, perception is someone's view (Makapela, 2017).

1.6 Significance of study

The importance behind the basis of this study was to measure the perception of emerging cattle farmers of Makhado Local Municipality on agricultural extension and advisory services. The findings of this study will add value scientifically as it gave the researcher an opportunity to understand the perception of emerging cattle farmers of

Sinthumule-Kutama villages towards extension and advisory services and their cattle welfare practices. The findings of this research paper will help extension advisors to identify the attitude held by emerging cattle farmers and whether the farmers are knowledgeable about cattle welfare practices.

This study will also challenge agricultural extension and advisory services to develop a program that can help farmers to improve their knowledge, skills and adopt the new practices that will help them improve their cattle welfare. Based on the perception of emerging cattle farmers, agricultural advisors will become aware of why emerging cattle farmers form a certain behavior and what they expect from them regarding the improvement of their cattle welfare.

This will ultimately improve food security and reduce poverty in the rural areas of Makhado Local Municipality since farmers will then be able to increase their dairy and beef cattle which they can sell at the local markets, local people, and business viability from cattle farming. Emerging cattle farmers will also benefit from this study as they may realize how they feel about extension and advisory services, and they might take into consideration their cattle welfare practices.

Farmers will also become aware of the practices they should implement to maintain their cattle welfare and they will also become aware of extension and advisory services (who are they, where they can find them and how they can access their services).

1.7 Organization of study

Chapter one gives a brief overview of the introduction, problem statement, aim, objectives, research questions, definitions of key concepts and significance of study.

Chapter two gives a detailed review of related literature with specific reference to the perception of emerging cattle farmers on extension and advisory services in improving the welfare of their cattle.

Chapter three outlines the methodology and analytical procedure used in this study. It includes the study area, description of the study, research design used, population, sampling methods, data collection method and data analysis procedure.

Chapter four is the findings and discussions of the study.

Chapter five is the summary, conclusion and recommendations of the study.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

An understanding of the perception of emerging cattle farmers towards extension and advisory service will contribute to a plan for transition into commercial livestock farming. The purpose of this literature review is to review relevant literature regarding the perception of emerging cattle farmers towards agricultural advisors in improving their cattle welfare.

Emerging farming is one of the three distinct agricultural farming systems that is practiced in Limpopo province. These three systems (subsistence, emerging and commercial farming system) noticeably produce crops and livestock. However, they differ markedly in the typical scale of operation, methods of production and market orientation as well as quality. According to Whitbread *et al*. (2011) subsistence and new farmers who make up the middle group to commercialize are termed emerging farmers.

Lack of technical knowledge and management skills may include cattle welfare practices in a sense that majority of emerging farmers do not know how to use equipment and how to implement management practices that are significant and valued in improving their cattle welfare (Nkosi, 2017). According to Fraser and Broom (1990), animal welfare denotes the desire to prevent unnecessary animal suffering. Therefore, farmers need to have knowledge on how to improve their cattle welfare considering that welfare plays an important role in livestock growth and production.

Extension officers can help emerging cattle farmers to improve their cattle welfare by many ways such as: providing them with scientific knowledge to improve and maintain their livestock welfare, linking farmers with researchers and innovators, including other farmers who are using their traditional remedies to maintain and to improve their cattle welfare and these traditional remedies can be vaccines and treatments for different diseases (Adisa, 2015).

Emerging farmers can access knowledge on the practices mentioned above regarding cattle welfare improvement by accepting extension officers to be part of their farm activities. Farmer's perception on extension and advisory services is a decisive concept in the adoption and rejection of agricultural innovation (Buford *et al*., 1995).

Everyone is said to have different perception on different aspects, same applies to farmers, and they have different perception on extension and advisory services. Emerging cattle farmer's perception on extension and advisory services might not be the same as commercial cattle farmer's perception on extension and advisory services. Perception might be positive or negative and there are factors that influence the status of the farmer's perception (Makapela, 2017).

Parminter & Wilson (2003) argued that positive perceptions of farmers on agricultural extension and advisory services make them adopt innovations, accept to cooperate with other farmers who are facing the same problems with them and to active participate in extension programs while negative perception on extension and advisory services is vice versa. For better results, farmers must hold a positive perception towards extension and advisory services on improving their cattle welfare.

Therefore, improving cattle welfare of emerging farmers will help farmers produce more yield, generate more profit and improve their livelihood because some rely on cattle production for source of income and it will also reduce poverty (Parminter and Wilson, 2003).

2.2. Socio-economic characteristics of emerging cattle farmers in South Africa

The role of socio-cultural and economic characteristics of a farmer in agricultural production has been widely acknowledged (Montshwe, 2006) because they can either improve or affect the emerging farmer's productivity. Hence age of a farmer in correlation with farming experience has significant influence on their production because older and more experienced farmers can make better production than the young ones (Martey, 2012).

This means that the recommended improved practices of maintaining animal welfare are more used by young farmers. Martey (2012) found that most of the head of the household was usually male, and they are found to be decision makers in production.

Quddus (2012) indicated that most rural cattle farmers were found to have primary education. It was further reported that they had no additional sources of income, and not receiving extension services.

The educational level affect production of livestock because those who have tertiary education will perform better than the ones with primary educational level since they will be having more knowledge and skills to help them perform better and sometimes research on other aspects that can improve their production. In my opinion those with tertiary education and who have access to sources of income in the form of credit will likely have a positive perception towards advisory services are likely to improve the welfare of their livestock and vice-versa.

Farmers with no other source of income will find it difficult to purchase tools and resources needed to perform some of welfare practices due to lack of money and this will affect their production negatively (Montshwe, 2006). Size of land also play a role in cattle farming, big land will enable farmers to have more handling facilities such as dipping dam and this will increase, improve cattle production (Birner *et al*., 2006).

Land ownership might also help emerging farmers with no access to income to secure credit by using land as a collateral and these advisory services could a major role in assisting farmers in this regard and this might improve the perception of famers towards advisory services. Land and cattle are sociologically considered as wealth or assets. It was discovered by Montshwe (2006) that majority of emerging cattle farmers consider cattle farming as a sign of household wealth, assets of inheritance and other socio-cultural roles hence cash and profit gained from cattle sales is not considered as a major reason.

Furthermore, it was also indicated that this kind of attitude will make them not to focus more on cattle production and welfare improvement because they are not aiming to attain good quality cattle products for market purpose and it is so because it is not their source of income. As noted in Birner *et al*. (2006), the reasons for effective service delivery includes advisory methods appropriateness, numbers of extension staff and capacity and the management and governance structures of the organisations delivering the services.

This may also depend in turn on the ratio of extension agents to farmers, and the use of participatory extension methods. The characteristics of local communities, such as educational level, ethnicity, role based on gender and the degree of social exclusion, will determine the ability of the extension services to penetrate communities and reach the disadvantaged, and the degree of farmer-to-farmer diffusion (Khapayi and Celliers, 2016).

The above-mentioned socio-economic characteristics determine the degree of adoption of an innovation and farmers final outcomes .These includes outcomes such as increased yields (for example, good quality and healthy livestock, increased income and empowerment. All these factors, including farmer's perception on extension and advisory services will determine the degree of adoption of an innovation and famers final outcomes such as increased yields.

Birner *et al*. (2006) reported that there are many different types of agricultural systems and agricultural extension is broadly described to consist of non-formal education system in which the learners are rural people, specifically farmers whose content is agricultural primarily (including crops and livestock production). The different approaches found in the various extension systems, use a variety of strategies and different methods and techniques (Birner *et al*., 2006).

2.3. Overview of livestock welfare worldwide

According to Fraser and Broom (1990) "Human do not understand animals 'preferences in terms of their health and the quality of their animals 'life." This suggest that there is a need for livestock producers to understand the welfare of their livestock because animal welfare is a science on its own right (Fraser and Broom, 1990). Livestock producers especially emerging livestock farmers who would like to increase their production yield and commercialize their farming can achieve this by improving their livestock quality.

This will be attained by adhering to the rules of animal welfare and by interacting with extension agents. On the other hand, extension agents should provide these farmers will relevant knowledge and skills on how they can improve the welfare of their cattle. In general terms, livestock welfare includes protecting animals from parasite and

diseases, this can be done by vaccinating to prevent infection and by treating the infection which have been diagnosed in the farm (Khapayi & Celliers, 2016).

Welfare also emphasizes the provision of clean water to animals and essential nutrients supplements to the animals to maintain their health preferences. Most of livestock farmers lose their animals through different diseases and this is because they are unaware and not knowledgeable about those diseases (Khapayi & Celliers, 2016). When farmers are unaware and lacking knowledge on different animal diseases they fail to vaccinate and treat their animals against those different diseases.

Some farmers can notice a sick animal through its symptoms, but they do not know what the cause (disease) might be and how to treat those symptoms (Montshwe, 2006). In the Limpopo Province cases of cattle diseases such as heart water tick (external parasite), and this tick can cause tick toxicosis, tick-borne diseases like African and Asiatic red water, Heartwater, Anaplasmosis, Lumpy skin disease and foot and mouth disease were reported (Khapayi & Celliers, 2016).

Cattle need to be vaccinated to protect them from bacterial diseases and fungal diseases. Bacterial infections that need vaccination include diseases such as botulism, bovine brucellosis, anthrax, bacterial red urine and viral infections such as BVD (Bovine viral diarrhoea), Rotavirus and Lumpy skin disease. Cattle also need dipping to protect them from parasites such as Flies, Ticks, Lice, Mites, Mites, Roundworms and Sandtampans (Montshwe, 2006).

2.4. Overview of cattle production in South Africa

DAFF (2018) reported that 80% of the agricultural land in South Africa is suitable for production of livestock. It is further reported that agricultural sector contributed income of 40%. Cattle farming is the major livestock activity in South Africa in both commercial and smallholder farms. According to DAFF (2019) the following provinces: Eastern Cape, KwaZulu Natal, Free State, and Northwest are provinces that are more concentrated with cattle production.

Land reform in South Africa, through programmes such as the Land redistribution for agricultural development encouraged a group of farmers known as emerging farmers to take advantage of entering livestock farming (Mcdonalds & Van Oudtshoorn, 2008).

Mcdonalds and Van Oudtshoorn (2008) further stated that these emerging farmers are land reform beneficiaries who have been granted institutional support such a land rights, improved access to extension and farming credit.

The goal of such farmer is to transform to commercial farming. Khapayi and Cellier (2016) described the smallholder sector by low farm capital investment, low number of labour (mostly family members) and lack of access to adequate market facilities. Mapiya *et al. (*2009) argued that in smallholder sector, cattle production is as low as 9% as compared to commercial sector which has a cattle production of 30%.

2.5. Livestock welfare in South Africa

The welfare of cattle in South Africa is mostly affected by number of diseases. Common animal diseases found are Anthrax, Black quarter (black leg), Rabies (mad dog disease), Mastitis, Tick fever and Listeriosis (Fraser *et al*., 1997). In the current structure of South Africa in veterinary services, various deficiencies were highlighted after evaluation of veterinary services carried by the World Organisation for Animal Health (OIE) (Fraser *et al*., 1997).

This resulted in different disease conditions in South Africa re-emerging and those conditions need more modern approaches and attention urgently. Quddus (2012) is of the opinion that these diseases are found in the Southern Africa Development Community (SADC) and they are diseases such as East Coast fever, bovine pleuropneumonia, which is contagious, Brucellosis etc. And they need to be eliminated. Furthermore, the red meat sector is facing new challenges on various sides.

On the side of animal health, consumer level of requirements must be considered when expanding or maintaining market share. These emphasizes the need to consider the guarantees of quality assurance and these includes freedom from disease, antimonial resistance to antibiotics, food pathogens etc. Potential epidemics and new disease challenges are given an opportunity to attack livestock when production animals are given a chance to interact with other species such as game and environment species.

Farmers need to be aware of those diseases and be also prepared (Fraser *et al*., 1997). If the farmer is aware, it reduces mortality rate of livestock as they will be able to respond to the symptoms given by the animal and with preparations, the farmer needs to have medication to treat the animals against those diseases and to vaccinate (Quddus, 2012).According to Aliber and Hall (2012) the situation of new emerging diseases will have studied and for existing diseases, more and best solutions must be found.

Animal health is relying highly on chemicals for pathogens control and it is costly to develop new disease/pathogen control chemicals as the old ones are not strong enough as pathogens can resist them(Fraser *et al*., 1997). Better informed consumers are making farm and wild animals' welfare to coming under more intense scrutiny. Even though best procedures have been followed to improve domesticated species welfare, these practices will need to be more trusted, transparent and reliable to satisfy consumers both international and national wise (Fraser *et al*., 1997).

In South Africa and Southern African sub-region, the financial success (profitability) of farmers lead to food security naturally and animal health play a significant role in profitability of a farmer considering that if an animal is healthy, it will yield more quality product (meat, milk).

2.6. Livestock production by emerging farmers in South Africa

According to Sikwela and Mushunje (2013) the National Department of Agriculture after 1994 reported that it is important to support and develop emerging and smallholder farmers of South Africa considering that they play a significant role in alleviating poverty and unemployment in rural areas of South Africa. After 1994, new local government structures were introduced by the government, Agricultural and Marketing Acts were reviewed, the land reform and redistribution were introduced by the government, to build emerging and smallholder farmers.

Vink *et al.* (2008) assumed that improvement of emerging farmers access to inputs, extension services, and mechanisation services made farmers benefit more. Muller (2003) stated that South Africa was found to be one of the cattle producers leading with a great potential for livestock production. Despite that South Africa is one of the

leading cattle producers, majority of cattle do not make it to auction markets due to low quality body mass (Muller, 2003).

This may be attributed to the fact that, most of the emerging farmers in South Africa lack knowledge and skills about farming, which gives them challenges in understanding and implementing some technical information offered to them by extension agents from the government (Meissner *et al*., 2013). Meissner *et al*. (2013) further argued that emerging and smallholder farmers need more access to extension and advisory services for them to achieve their goals. This simply indicate that extensive knowledge disseminated by the extension agents is crucial to the success of cattle farmers. Especially the emerging farmers.

According to Nkosi (2015) emerging livestock farmers lack support from public agricultural advisors and it leads to poverty, food insecurity as those farmers do not access information that can improve their farming for them to increase their production. In most cases, emerging livestock farmers rely heavily on welfare grants from the government as they cannot generate profit from their products, as they do not produce more quantity and quality that make them qualify to sell to formal sectors(markets) (DAFF, 2012).

Farmers can produce more food and generate more income that can assist them to fulfil their needs if they have adequate access to agricultural extension and advisory services as they will be able to obtain required information and skills for livestock and crop production. Kimaro *et al*. (2010) and Nnadi *et al*. (2012) suggested that livelihoods of resource-poor farmers can be improved, and agricultural production can be increased if they acquire new skills and modern agricultural innovations.

However, most communities are engaged into contract farming with established multinational companies who they produce and sell their products to them. Majority of those communities who are participating in contact farming benefit from programmes initiated by government in relation to land redistribution.

2.7. Challenges faced by emerging livestock farmers

According to Animal and Aquaculture Production (AAP) (2006) emerging farmers are faced by several challenges such as stock theft, poor fencing of their herd, poor and little infrastructure, uncontrolled movement of animals which contribute to animal infections because healthy animals will be exposed to infected animals and if the disease is contagious then it will pass from one animal to another.

Poor fencing can enable predators and parasites to enter the animal herd camp) and even diseases, viruses and infections can be passed from neighbouring animals to the new animal camp through parasite and predators (McDonald & Van Oudtshoorn, 2008). Emerging farmers will fail to compete in the commercial environment as they will be limited by these challenges, for example, in South Africa beef is still imported from countries such as the United States of America, as farmers are failing to produce good quality for the market (Katikati, 2017).

Therefore, emerging farmers in South Africa can transform to become commercial farmers if they are empowered and undertaken through training on how to manage and handle cattle. Scholtz *et al*. (2008) further described the smallholder sector by revealing that the female cattle proportion in the herds of emerging farmers are less compared to the female proportion in commercial sector. Smallholders achieve half calving percentage of that achieved by commercial farmers (Scholtz *et al*., 2008).

This is attributed to decease control, animal handling and breed management of the livestock. These attribute to the fact that cattle production of smallholder farmers is very low compared to the production of commercial farmers. Smallholder farmers should be supported by the state agricultural extension and veterinary services in order to enable them to improve the productivity of their herds for South African red meat to reach the competitive levels of production.

Katikati (2017) suggested that a special attention should be given to emerging livestock producers and it is the responsibility of the state services to ensure that all emerging livestock farmers get access to the services that can contribute to the improvement of their livestock welfare. Khapayi and Celliers (2016) conducted a study to identify the challenges that prevent the commercialisation of emerging farmers into commercial agricultural markets.

They indicated that the challenges manifest themselves both internally and externally. Indicating that both internal and external factors should be taken into consideration when attempting to address the challenges. Their study further indicates that there is a need for offering services as one of the important agricultural sector interventions for rural development, for instance, improving food security, commercialisation alleviation of poverty and generation of income for emerging (Khapayi and Celliers, 2016).

Support services refers to agricultural and advisory services that provide farmers with relevant and useful information that can modify their productivity and increase their profitability. In my view, this is one of the most important supports that could improve the welfare of the emerging farmer's cattle and transform their scale of production into commercial. Therefore, there is a need of support to the farmers in the form of advisory services.

Khapayi and Celliers (2016) suggested that the commercialisation of emerging livestock farmers can only be achieved through provision of appropriate support services to farmers from agricultural extension and advisory institutions. Emerging cattle farmers can contribute to agricultural growth, increased farm impact and rural growth if they have an adequate access to agricultural and advisory services (Khapayi and Celliers,2016).

This means that agricultural extension agent can help farmers to commercialise through the provision of useful information such as where they can access loans and how to apply for those loans and if the farm is now producing in a commercial manner ,the cattle producer can then hire rural people to assist with some of the farm activities and by doing so, the producer will be creating jobs for rural people however this contribute to rural development, poverty alleviation and food security because rural people will then improve their livelihoods when they have source of income.

In the study conducted by Khapayi and Celliers (2016), farmers were asked about the support services that they receive and they provided various responses, majority of the interviewed farmers namely 64% claimed to be receiving agricultural advisory services for their farming enterprises whereas 36% of the interviewed farmers reported

that they do not receive agricultural advisory services, but they rely on their own resources (inputs) for production.

They further investigated the frequency of the visit by extension officers and farmers affirmed that extension officers visited them occasionally and none of them could recall the visit routine. However, farmers who were receiving support services appeared to have more than one source of support services and different types of support services. Majority of farmers were receiving support from the government in a form of water, feeds (bale) during droughts and medicine during disease outbreaks. (Khapayi & Celliers, 2016).

It was further indicated that funding, farmers who are receiving agricultural advisory services are high than those who do not receive agricultural advisory services therefore those who receive the support service will have their production improved because they will have some resources this includes inputs such as feeds and medication from agricultural institution like the Department of Agriculture.

Other farmers uttered that the department of agriculture supported them with the implementation of poultry structures and with implementation of piggery structures to some farmers (Aliber and Hall, 2012). Farmers also reported that they received market support and buy some of farmer's commodity for feeding scheme and care homes. By buying farmer's commodities, the community NGOs were supporting farmers financial because they are increasing their profit and encouraging farmers to produce more for, they know that they have a customer (Aliber and Hall,2012).

Emerging farmers were found to be participating in markets that do not yield high returns. What have been mentioned above need to be addressed effectively for emerging farmers to transit into commercial sector and to contribute to agricultural growth and rural development. Khapayi and Celliers (2016) study identified challenges that constrain emerging farmers from reaching a commercial production sector and these challenges are emerging farmers who are less educated, they lack skills in both crop and livestock farming, lack of information and poor access to markets, high cost of goods transportation and poor support services from the government.

Majority of the emerging farmers products are sold to informal markets with low market value and some of these farmers used different marketing channels (Khapayi and

Celliers, 2016). Increased production of emerging rural farmers will make require more labours for farm activities and this will create more job opportunities for rural people. If more rural people are employed it leads to rural development because rural people will then be independent financially, they will be able to afford their felt needs and this means their livelihood will be improved too (Kimaro *et al*., 2010; Christoplos, 2010; Nnadi *et al*., 2012).

Livestock producers especially emerging famers who would like to increase their production yield and commercialize their farming can achieve this by improving their livestock quality through adhering to the rules of animal welfare and through interacting with extension agents as they will give them enough knowledge on how they can improve the welfare of their cattle. In other words, extension agents can provide livestock farmers with animal's health preferences from birth until they reach market stage.

2.8. Cattle Welfare challenges faced by producers in South Africa

All ages cattle (young and growing) are exposed to a variety of ailments. Cattle infections can be of mild conditions and some may lead to death if not treated. The money used on cattle medications (prevention and treatment) can reduce farmer's profit. Good health care is very important in cattle farming and it must be considered even when cutting off other production costs.

The cheapest and easiest method of controlling diseases is prevention. Cattle shelter (herd/camp/house), water troughs and feed need to stay clean to reduce the chances for diseases to attack animals. Illness occurrence can also be reduced by parasite control, vaccination program and observing animal's camps frequently (Fraser *et al*., 1997). A sick animal can be recognised by its abnormal behaviour or its physical appearance.

Through physical appearance, illness can be spotted when the following symptoms are identified namely, diarrhoea, inactive, ears drop, head down, loss of appetite and high temperature. A high temperature usually indicates disease. To reduce spread of diseases from one animal to another, it's better to first find a sick animal quickly, treat it against the diseases and secondly try to remove the cause of the sickness.

Sick animals need to be treated and the cause of sickness need to be eliminated because the rest of the herd will be exposed to the disease if one or more animals are sick. In cattle production health problems are commonly found during or after weaning stage, transportation (shipping, moving cattle), calving extreme weather conditions and stress. Extra attention needs to be given to animal's health after a stressful period because an animal's ability to resist infections can be reduced by stress (McInerney, 2020).

Common cattle diseases

Katikati and Fourie (2019) reported four common health diseases that most beef producers encounter as respiratory diseases, brucellosis, external parasites and internal parasites. It is the researcher's observations that there are also other diseases that affect livestock in South Africa and farmers also need to be aware of them such as anthrax, bloating, heartwater and redwater (McInerney, 2020).

Respiratory diseases

These diseases are found to be common in cattle. They are caused by number of factors such as bacterial or viral infection, stress, inadequate nutrition. The best way to prevent outbreaks of respiratory disease can be through the following practices: vaccinating calves, bulls and cows and good farm management (ILRI, 2010). This can be done by developing a schedule that shoes type of feed to be given to animals and that are recommended, with adequate nutrients required and a veterinarian can help farmers to develop one (Balzani & Hanlon, 2020)

Brucellosis

According to ILRI (2010) brucellosis is of the crucial disease in cattle farming as it can lead to sterility and abortion in cows. Brucellosis is described as notifiable disease under South African Animals Health Acts 7 of 2002. To prevent these diseases all heifers between 4 to 10 months in farmer's herd need to be vaccinated (ILRI, 2010). The spread of this disease is commonly through purchasing infected animals that will pass the diseases to other animals in the herd and this can be prevented by purchasing only cattle that are vaccinated against brucellosis (McInerney, 2020).

External parasites

External parasites are insects that cause stress to animals. External parasites include insects such as flies (stable, face and horn flies), lice and ticks (Balzani & Hanlon, 2020). These parasites are large health problem in cattle farming because they lead to poor performance in cattle as they cause animals not to graze and most of their time in the shade (ILRI, 2010). To reduce external parasites in the herd, parasite control treatment can be used or flyerpellent ear tags and areas where pests reproduce must be eliminated. Animals infested by ticks can be treated through pour-on and dips (McInerney, 2020).

Internal parasites

ILRI (2010) argued that internal parasites also cause poor performance and in young animals they can lead to death occasionally. These kinds of parasites are hidden such as liver flukes, lungworms and roundworms. Internal parasites attack cattle commonly and those cattle are likely to get infected by those parasites when grazing pastures that are established.

Internal parasites can also be a big problem in confined areas. Invasion of the stomach or intestinal wall by a parasite infestation in intestinal wall or stomach can cause organs damage and leads to poor digestion of nutrients (Balzani & Hanlon, 2020). Parasite infestation can be recognised by noticing and identifying the following symptoms namely, poor gains, rough hair coat, potbelly appearance and scouring (ILRI, 2010).

Internal parasite numbers can be reduced by using dewormers at the right times during the year for example it can be used every time when seasons change. These parasites can be diagnosed through examination of faecal samples, those samples can assist a veterinarian to identify the type of parasite affecting the cattle and to recommend the type of deformer that can be used to fight that type of parasite found (effective).

Disease control

Most diseases affecting cattle can be vaccinated and parasites that can cause damage in cattle can also be controlled (ILRI, 2010). Several factors such as cattle location(region), nutritional level of animal and prevalence in the herd. Extension

agents can work with veterinarians to help farmers to draft vaccination program considering the farm conditions. Considering all the diseases and conditions that affect the cattle, it is of utmost importance that proper dissemination of disease control and termination reach the cattle farmers. It can be concluded relating to most studies reviewed that animal welfare is one of the challenges facing emerging cattle farmers and most of those farmers cannot control diseases that are affecting their livestock due to lack of knowledge and money to purchase resources and tools used for disease control (such as injections).

2.8.1. Knowledge and practices of emerging cattle farmers on their livestock welfare

i. Diseases control

In the study of Katikati and Fourie (2019), 88% of cattle farmers revealed that they vaccinate their cattle while 12% were not vaccinating their cattle. The diseases which were most vaccinated were found to be Black quarter (42%), Red water (40%) and Anthrax (30%). The least vaccinated diseases were found to be Footrot (2%), Trichomonas (2%) and Pulpy kidney (2%). Some of those farmers were just vaccinating their livestock without knowing the specific diseases they are dealing with. This kind of behaviour displayed in Katikati and Fourie's study gives one an impression that it is important that farmers need to be educated to avoid wasting of resources unnecessary.

Furthermore, this kind of behaviour by farmers reveal that farmers are not knowledgeable about some diseases and they need to get support regarding their cattle welfare. Extension agents can support those farmers by providing information that will help farmers to improve their cattle welfare, introducing cattle welfare programmes, by practicing or demonstrating vaccination, parasite control while visiting and encouraging farmers to visit their herd/ camp frequently for observations, this will reduce occurrence of illness in a cattle herd (Katikati and Fourie, 2019).

The information that must be transferred to emerging cattle farmers includes concepts such as signs of different cattle diseases, how to treat those diseases and when to prevent (vaccinate) those diseases. Katikati and Fourie (2019) suggested that extension agent can also facilitate emerging cattle farmers through non-formal education on how they should follow vaccination based on the season of the year and geographical location of those farmers.

Extension services can also involve and encourages agricultural companies selling livestock health (medication) and feed products to participate in programmes that aims on improving the cattle welfare of rural emerging farmers.

ii). Parasite control

Katikati and Fourie (2019) indicated in their study, that majority of farmers with (52%) were found to be frequently practicing pour on method for parasite control, followed by plunge dipping with 33% and hand spraying had 30% of respondents practicing it. The least practiced methods were found to be injectable parasiticides, spot treatment, and dosing with 16% of respondents.

De La Fuente *et al*. (1998) stated that in tropical and subtropical areas of the world, external parasite (ticks) control and the transmission of tick-borne diseases remains to be a problem in cattle production (farming). Even though farmers are implementing their traditional methods to control parasite, they are still losing their cattle through parasite attack and diseases transmitted.

Therefore, there is a need for parasites control in cattle considering that they can cause stress, diseases, even wounds that can damage the livestock skin which can reduce its market value (through skin quality) and wounds can also damage the teats in cows (Moyo and Masika, 2009). Based on the results of Katikati and Fourie (2019), majority of the respondents 82% were found to be controlling internal parasites while few of them 18% were not controlling internal parasites at all.

Internal parasites are said to be a continuous problem worldwide and one can use non-chemical parasites control methods for their effective control (Waller, 2006). Williams and Loyacano (2001) argued that Internal parasites have negative impacts on livestock such as damaging internal organs and affects the digestion process of animals which can lead to death in young animals and they can also cause deficiency in the performance of an animal.

Reported by most farmers, one of the factors which influence their view of animal welfare is knowledge. Farmer's view of animal welfare innovation (farmer's animal welfare innovation) implementation was influenced by the abilities, skills and knowledge of farmers. Facilitation of positive HAR and farmer's perception of control were influenced by higher degrees of technical knowledge (Adler *et al*., 2019).

Furthermore, farmers who had lower risk of causing any harm to their animals are those farmers who understood the importance of their behaviour towards livestock, those who also understood animal welfare concept and those who were trained.

Campler *et al*. (2018) noticed that farmers who felt more knowledgeable and confident regarding identifying a sick animal are those who gathered as empathetic and confident compared with those who were lacking knowledge and unconfident.

2.9. Farmer's perception of extension activities in South Africa

Several studies have been done on the perception of farmers towards extension activities in South Africa for example; Forbang *et al*. (2019) conducted a study to assess farmer's perception on effectiveness of extension delivery approaches to livestock farmers specifically female farmers and the results revealed that perception of farmers on participation in extension delivery services was 77%, while organisation of field days was 63%, farm visit by extension agents was 53% and all were interpreted as being effective.

Forbang *et al*. (2019) also observed that holding field meetings with farmers was 30%, indicating the ineffectiveness of the meetings. Generally, Forbang *et a*l. (2019) found that livestock farmers had a negative perception towards extension services delivered to them regarding livestock farming and the quality of extension services delivery. They further explained that livestock farmers believed that the qualities of extension services are not effective at all level of implementations.

Thus, agricultural advisors should improve their extension delivery approaches and they should attempt to create new strategies that can improve on service delivery to livestock farmers. Negative perception of livestock farmers might be due to their extension delivery approaches used and less farm visit by extension agents and which can make farmers think that they are not considered to be important and they might as well think that they do not need extension services to achieve their production goals (Waller, 2006).

2.10. Farmers' views of animal welfare

According to Fraser *et al.* (1995) the interpretation of the concept of Farmers Animal Welfare (FAW) differed amongst farmers with consistent patterns observed over thirty years, despite differences in methodologies, species, and topics.

The ability of farmers to bond with their animals helped in identifying the difference of farmer's perception of animal welfare. Species, housing system, farming (production) system, life span influence the relationship (bond) that farmers have with their animals. For example, Farmers that handle their livestock frequently such as milking cows create a bond between them and their animals (Balzani & Hanlon, 2020)

According to Bock *et al.* (2007) focusing on dairy farmers, good farmer's view of animal welfare was good with 55% looking Affective state and naturalness. Affective state was considered as part of animal welfare by pig farmer's referring to their views of animal welfare.in studies focusing on views of different animals, it was mentioned that the animal welfare needs were satisfied by enabling biological functioning. These results may be explained by the fact that much of the literature reviewed focused on dairy and pig farmers' perception of farmer's animal welfare.

Bock *et al.* (2007) study was carried out to investigate the level of attachments between farmers and their different animals. This investigation indicated that there is no difference between the relationship of farmers and their animal species but compared to other animals, farmers felt closer to their cows. The bond between farmers and their animals was also influenced by the lifespan of animals. The level of attachment also varied between those who are working with breeding stock and those who are preparing livestock for slaughter, their, feelings, attitudes behaviour were not the same.

Degrees of emotional attachment was expressed variously by those farmers who were working with breeding stock whilst the degrees of emotional detachment were expressed variously by those preparing livestock for slaughter. All concepts of farmer's view of animal welfare were important by farmers. Ease of management were determined by equipment, barn layout, space availability and conditions of the animal houses. Which were associated with better animals' treatment, well-being of farmer and animal handling improvement by a farmer (Maziya, 2017).

Reported by Maziya (2017) few farmers with 11% consult with community animal health after noticing that their animals are sick while 18% go to state veterinary and majority of cattle farmers 20% sought assistance from other farmers' co-operative. From the Maziya study, it can be stated that most of cattle farmers had access to animal health services.in addition, they knew what to do and where to consult for help when their animals and this shows that information was disseminated from agricultural specialist to farmers.

Educational level of farmers influences their selection of animal health services (Maziya, 2017). It was noticed that the state veterinarians were consulting farmers with tertiary qualification (Maziya, 2017). The reason could be due to their tertiary knowledge on animal welfare and awareness on how and where they can get help regarding their animal health. As they went to tertiary, they might also be having other jobs except farming which help them to generate some money to afford for private veterinary services.

On the other hand, with disease prevention most farmers indicated that the animal health practitioner visits them regularly for vaccination and most of them vaccinate against anthrax and black quarter while others reported that they were trained to vaccinate their livestock and the trainings were organised by the government. It is an indication that farmers received services regarding their animal welfare and some also gained skills and knowledge on how they can maintain and improve their cattle welfare from those trainings (Waller, 2006).

According to Walter (2006) still focusing on this study only 64 % vaccinated their animals while other 36% did not. Most farmers agreed that vaccination is important while others, (10%) disagreed. Some farmers did not vaccinate because they believe that vaccines cause harm to animals, some did not see positive results from vaccinating while others believed that remedies are most effective than vaccine. In other words, it can be indicated that farmers were aware of animal welfare practices and majority of those cattle farmers perceived animal welfare as an important factor in animal production.

It was established that the majority (65%) did not have access to this information while the rest did (Walter,2006).Cost of medication used for Prevention and treatment of

cattle diseases have a significant impact on the profitability of cattle production, this makes cattle producers to be concerned about their cattle welfare throughout the world (ILRI, 2010).Too high cost of medication will reduce the profit cost of the producer (Katikati, 2017).

For cattle feed, most farmers prefer public grazing lands because they are affordable and profitable. According to Ranson (2011) this type of grazing is not scientifically recommended because cattle get exposed to some health problems brought about by plants and this may create stress, diseases, or death to animals (Clark & Johnson, 2009). Carter (2010) revealed that weaning can also affect cattle production considering that when calves are weaned, they become stressed which may lead to weight loss, disease and even death.

2.11. Livestock farmer's participation and access to extension activities

Several studies have been conducted on the participation of livestock farmers and access to extension activities. According to Carter (2010) majority of farmers with 60% were found not participating in any activity of livestock extension. However, 11% of farmers had direct contact with extension agents for 21-20 times per annum. About 60% of the respondents did not participate in any form of livestock extension activities in the last two years.

Furthermore, respondent's contact with livestock farmers during the same period was somewhat low; with only about 11% participating in direct extension contact with their clientele up to 21-30 times in a year, while 21% had direct extension contact with extension agent for 1-10 times per annum. Those who participated in Livestock extension activities about 40%, had a contact with extension agent and those agents worked with 100-150 farmers in a year.

Extension activities provide good potentials for extension teaching and learning effectively. Some farmers (more than two-thirds) scored their participation level in Livestock-Extension activities as 'high' or 'very high', whereas 36% of respondents scored their participation overall as 'average' or 'low' in the last two years (Carter, 2010). However, this shows that farmers were satisfied with their participation on extension activities and if they are provided with a better working environment, they might perform even better.

Ten major constraints were identified, out of which inadequate livestock production programme was found by a leading constraint from all ten major constraints to Livestock-Extension which were identified in the study of Adisa (2015) between crop production and animal production programmes, the one which receive less attention is animal production programme and this affects livestock extension service consequently.

According to farmers who were interviewed in the study of Adisa (2015) this scenario of paying less attention on animal production programmes was affecting service delivery of livestock extension even more. Respondents identified other three quite related constraints, but they differ with their respective significance. These include poor funding of livestock extension activities, inadequate agent's training programs and few institutions that support livestock extension.

Furthermore, respondents showed that most citizens had more interest in arable crop farming than in livestock production (their level of interest is low). Financial and technical barriers might also be factors influencing low interest in livestock production. Respondents also noted that there is inadequacy of veterinary and this explains why there is a lack of competence in animal welfare issues.

Referring to Adisa's results, livestock farmers and crop farmer's conflicts, ability to reach livestock producers and participation and interest of farmers on extension programs relevant to livestock were not considered to be constraints in the strengthening of livestock extension service in the study area. Almost 40% of the studied agents were participating in extension activities, however their participation was found to be low and limited.

Agent's lack of skills, knowledge and abilities in various practices that are important in livestock production was revealed by their competency assessment in livestock production skills and it also revealed that they had average scores (livestock production skills). Constraints to livestock extension need to be arrested for the role of extension namely, enhancing the level of production and improving the standards of livestock farmers traditionally and because livestock production has an important in food security, economic development national wide (Davids *et al.*, 2005).

Nowers *et.al*. (2013) found that government provided emerging cattle farmers with services like vaccination and tick control and other services like deworming were poorly executed practices. Voluntary and energetic participation of intended recipient makes people-centred development to be successful (Davids *et al.*, 2005). For farmers to participate fully in extension activities, according to Bembridge (1999), such farmers must be prioritised, be given ownership and accountability for managing public extension.

It was argued by Rivera and Gustafson (1991) that when farmers are involved in the planning process of the programme, it gives them an opportunity to address their needs and problems they are and the solutions they are expecting to deal with their needs and problems. It then also gives farmers an opportunity to meet other farmers who are facing the same problems as them and learn from each other.

Researchers believed that it is important to involve farmers in programme planning stage in developing countries because involving farmers in extension activities is critical (Leeuwis and van den Ban, 2004). In agricultural sector, people who are supposed to benefit from extension services are farmers. Agricultural extension is used as policy instrument by the government (Van den Ban and Hawkins, 1996).

Makapela (2017) reported that new agricultural skills were gained by farmers with 42% from services provided by extension agents whilst majority of farmers with 58% did not gain any skill from those agents. Few farmers with 46% agreed that extension services have brought changes in their lives whilst majority of those farmers with 54% stated that extension services have failed to change their lives, they felt that there was no improvement brought to their lives by those services.

Those (46%) who did not notice changes brought to their lives by extension, were found to be aware and understanding the objective of agricultural extension organisation. Extension officers provided subsistence/smallholder farmers technical advice regarding their maize seed and those farmers accepted advises. Extension officers told farmers that “genetically modified maize seed is best as it is normally roundup ready and weed can be killed by just application of weedicide”.

Based on the study by Makapela (2017) farmers argued that agricultural programmes offered by the department contribute to agricultural productivity and poverty alleviation, those farmers were found to be positive about those agricultural programmes.

Furthermore, such farmers were found to be producing good produce, but their main concern was that those produce were being sold to households in different communities and in street by vendors, sometimes in informal markets.

This paragraph is more about farmers' perception on effectiveness of agricultural extension organisation. Financial assistance was the main challenge farmers (70%) were faced with as majority of farmers found it difficult to get assistance financial wise from the government and this includes funding. Only few farmers (30%) accepted that they received financial support from the government. Most of farmers showed that they use technologies from their own informal trials where technologies recommended have not been adopted.

Five aspects were used to analyse farmer's perceptions concerning the effectiveness of agricultural extension organisations in the municipality (Makapela, 2017). Those aspects are qualities of extension services, extension agents 'competency (technically), extension policies, role (functions) of extension officers and sufficiency of agricultural extension officers. Rural people have changed their views and beliefs concerning agriculture (Kepe, 2004).

The questions asked in the study by Makapela (2017) were based on whether farmers received services they required from extension officers and whether those services were developing them enough and effectively. Five questions were given to farmers regarding the effectiveness of extension organisation. According to DAFF (2018) development and poverty alleviation can be through the adoption of new modern technologies and innovations offered by extension and agricultural advisors because they are a broad technical and advisory tool.

In the study conducted by Makapela (2017), 80 % of farmers agreed that in their municipality, government addressed their needs through their extension strategy and they were positive about it. Therefore, this is an indication that certain needs of farmers were importantly prioritised, recognised and attended by the government as most basic to local communities. On the other hand, agricultural extension organisations were viewed ineffective by farmers and this was revealed by the perception of farmers on extension officer's effectiveness (Bembridge, 1999).

In this regard, extension policies, functioning of agricultural advisors, extension services were not satisfying farmers. Agricultural advisors were perceived to be

lacking technical skills required for them to be effective. Furthermore, agricultural advisors' ratio to farmers was perceived to be less and this makes their services to be ineffective. All those perceptions assessed implied that farmers are not satisfied about agricultural extension organisation, and they seemed to be aware of what was supposed to be provided (services) to them from agricultural advisors hence those services were not provided (Bembridge, 1999).

2.12. The contribution of extension activities to emerging livestock farmers

Through the support of the extension officer, their production can be improved since they will be performing practices that are recommended scientifically and that are harmless to their animals (Nicholson *et al*., 1999). Reported by Elleboudt (2012) agricultural extension officers encourage farmers to adopt new, improved methods of farming (this includes breeding and other livestock management practices).

The municipal extension office located in the Bergville town was found to be responsible for the development of livestock farmer's organizations veterinary services, dip-tanks, and marketing facilities that will help rural farmers (Elleboudt, 2012). To improve these farmer's productivity, the agricultural extension agents also need to assist farmers through training in improved farming methods and techniques e.g. breeding methods and techniques.

It could result in better production efficiency and income, better standards of living, and lifting the social and educational standards of rural life. An integrated and well-coordinated agricultural extension programme, driven by a team of trained and knowledgeable specialists in the field of animal production, could offer the much-needed improvement towards economic cattle production by offering animal welfare practices information to emerging farmers (Elleboudt, 2012).

The findings of Nkosi (2017) present that more than 50% of small-scale livestock farmers have better access to public agricultural extension and advisory services and 14% have access to private extension. The low access to private extension and advisory service like this is so because farmers were expected to pay for the services they received. This is good because most small-scale farmers rely on public extension to receive information about improved technologies and in this finding more farmers are getting information from public extension (Oladele and Mabe, 2010).

The report by Nkosi (2017) also indicates that an improvement was there on the level of access to agricultural extension and advisory services by small scale livestock farmers compared with the level of access which was there more than 15 years ago. Nel and Davis (1999) support Nkosi by indicating that in South Africa the level of access to extension and advisory services was low.

According to Van Niekerk *et al.* (2011) and Ndoro *et al*. (2014) found that in South Africa the level of farmers access to public extension and advisory services was low because of low ratio of extension agents to farmers, who had large coverage area of several wards to one extension agent without adequate transport; and lack of tools and equipment to carry out farm demonstrations.

It can be assumed that there is an improvement in the department of agriculture and extension services (such as more tools to carry out farm demonstrations, ratio of extension to farmers have decreased) that makes farmers to access public extension and this is because of the huge difference between the findings of Nkosi and Van Niekerk (2011) about level of access to agricultural extension and advisory services by livestock farmers.

Ngomane (2002) states that most of the emerging livestock farmers choose public extension services because they cannot afford to pay the fees charged by private extension services. This is not surprising considering that majority of rural emerging farmers are black, and it is a well-known fact that the apartheid government segregated black farmers from white farmers (Düvel, 2005). The other reason is that private agricultural extension and advisory services target commercial farmers who make profit compared with public extension services, which focus more on emerging farmers (Koch and Terblanché, 2013).

2.13. Roles and qualities of extension officers in improving emerging farmer's knowledge

Buford *et al*. (1995) suggested further that training needs must be determined by extension management to ensure extension officers are trained well and to their capabilities. Low educational level of extension staff is one of the important challenges in South Africa facing services of agricultural extension as compared with their research educational level (Buford *et al*., 1995).

The agricultural extension service institutions play a crucial role, in improving farmer's competency in farming because it links farmers with other actors in the economy, disseminate knowledge (agricultural information) and technical skills (new innovations introduction and demonstration on how they operate). However, there is limited access to extension services in most parts of the country with (Extension Recovery Implementation Plan, 2008) reported that the national extension staff: farmer ratio is1:1,500 and in most part of the country, this limit farmers access to extension services.

This situation delayed majority of farmers from adopting advanced agricultural technologies. To increase access to extension services by farmers, more extension staff need to be recruited and NGO's therefore also need to be involved. Nagel (1997) stated that in developing countries, extension officer's working conditions are bad and difficult. Nagel (1997) further observed that fieldwork is characterised by conditions that promote low morale such as extremely low salaries, shortage of equipment and lack of mobility.

Many extension workers suggested that additional income sources are required for them to survive physically (Nagel, 1997). These difficulties contribute to a high turnover rate; those who remain in extension profession are typically people with few employment opportunities elsewhere. According to Kaimowitz (1991) agents who have few employment opportunities elsewhere are the ones who will remain in the extension profession and those with more opportunities will go for other opportunities to generate more income.

The efficiency and effectiveness of an organisation on how it functions have a connection with individual agent's knowledge level, problem perception and attitude because agents are working for the organisation, if they are negative in any of the mentioned above, the effectiveness and efficiency of the organisation will also be limited. An important question to be considered is the self-image of extension officers.

The task of bringing about extension officer must be motivated personnel to bring behavioural change in farmers successfully (Bembridge *et al*., 1999). Community-based service delivery need support from the agricultural extension organisation.

These supports can be through the provision of training, resources, information, linkages facilitation and management. (Bembridge, 1999).

One of the important elements among extension services which is considered as a significant factor in the success of the organisation is an assessment of extension officer's educational needs (Buford *et al*., 1995). Buford *et al*. (1995) stated that maintenance of proficiency or become qualified for promotions are challenges faces by extension officers when learning new skills. The importance of training extension officers through programs are noticeable.

It can be through extension officers that farmers improve their knowledge regarding their livestock welfare. Well trained extension officers can play a significant role in farmers knowledge improvement as they can select appropriate approach that suit each farmer. It can be concluded that effective extension delivery services need extension agents with good qualities.

CHAPTER 3: METHODOLOGY AND ANALYTICAL PROCEDURE

3.1 Introduction

This chapter describes the research process of the present research study (the research approach used to lead into the findings). It has 7 subheadings which are: (3.2) Study area,(3.3) Description of the study,(3.4) Research design (3.5) Population,(3.6) Sampling method and (3.7) Data collection methods(how the data was collected will also be discussed under data collection method) and (3.8) Data analysis.

3.2 Study area

The study was carried at Sinthumule-Kutama rural areas which are located under Louis Trichardt town of the Makhado Local Municipality in Vhembe district. The municipality is known to be one of the four Local Municipalities in Vhembe District of Limpopo Province. Madzivhandila (2015) reported that this municipality is made up of 279 rural tribal villages and five formal towns, namely, Vuwani, Vleifontein, Dzanani, Louis Trichardt, and Waterval.

The total number of villages in Sinthumule-Kutama is eighteen (18). The study only focused on nine (9) villages of Sinthumule-Kutama considering that all 18 villages can hardly be reached because of time and cost. Nine villages were selected randomly from eighteen. Makhado Local Municipality (2014) reported that the municipality experiences the average annual rainfall of 1 300mm. Both in summer (30 °C) and in winter (20°C- 25°C), the temperature of this municipality is very moderate (Makhado Local Municipality, 2018).

August is the driest month with rainfall of 5 mm. Most rainfall is experienced in January,with an average rainfall of 110 mm.. It is very warm in December because the temperature is at the average of 22.0 °C. In July, the average of 13.6 °C temperature is experienced, and it is the lowest average temperature of the whole year (Makhado Local Municipality, 2018). According to Stats SA (2014), the total number of the municipality's population is assumed to be 516 031 and it increases at about 1% every year.

Madzivhandila (2015) indicated that most citizens in this municipality are engaged in crop and livestock farming as a way of producing and providing food for themselves, but their production has decreased compared to how it was 14 years ago. Madzivhandila further indicated that previously, citizens used to rely on their own production for food, they were dominating more on crop production such as groundnuts, maize and sorghum as well as livestock such as cattle, chicken and goat.

Currently, most of these households depend highly on purchased food commodities since they cannot produce enough food for their families and they hardly reach required quantities of crops and livestock for the market (Madzivhandila,2015).The municipality was appropriate for this study because it had more livestock producers.

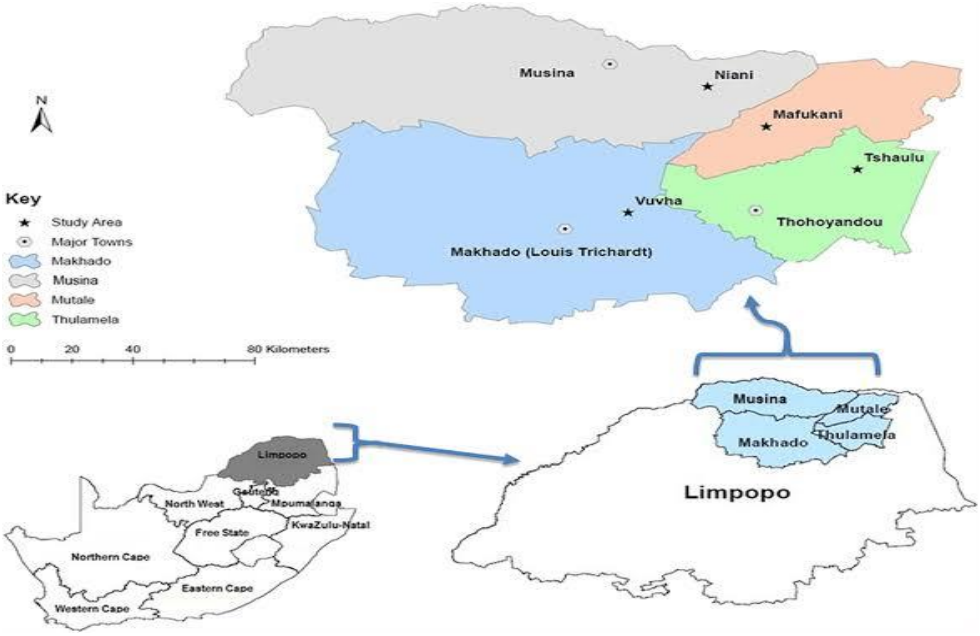

Figure 3.1: Map showing study area.

Source: https://municipalities.co.za/img/provinces/limpopo_municipalities_map.png

3.3. Description of the study

The study was focusing on rural emerging cattle farmers of Makhado Local Municipality in Limpopo province, specifically those from 9 villages of Sinthumule-Kutama. Makhado Local Municipality was chosen because there are many cattle producers under this municipality and there are limited studies on their perception and cattle welfare improvement.

Emerging cattle farmers were interviewed to provide the information that will help to determine their perception on extension and advisory services in improving their livestock welfare. Studies have showed that most emerging farmers lack new knowledge, skills and technologies that can improve their ways of farming (AAP, 2006; Katikati, 2017; Khapayi and Celliers 2016). This study also attempted to find out whether cattle farmers do get support from extension officers on how to improve their cattle welfare.

3.4. Research design

The study followed descriptive research design which pay attention to individual experience and take context into consideration. Descriptive research allows the researcher to answer ”*what perception famers hold towards agricultural extension and advisory services”.* The study is a qualitative study which also used a quantitative data and it made use of a primary data. The data was collected using semi-structured questionnaires (with both closed-ended and open- ended questions) and interviews guides when collecting data. For efficient purpose, the researcher filled the questionnaire surveys. The data was recorded using English language by the researcher. The research design included both quantitative and qualitative data to provide a better understanding of farmers’ perceptions on extension and advisory services in improving their cattle welfare.

3.5. Population

The target population was primary sources, and this refers to respondents, specifically emerging cattle farmers that were found in Sinthumule-Kutama villages of Makhado Local Municipality. The study population included both participants and non-participants of extension programmes since they could also supply a researcher with reasons for not participating in agricultural extension programs and what they know about agricultural and advisory services.

The information helped the researcher to reach the conclusion of the study. The sample size was selected from the sample estimation table published by Krejcie and Morgan (1970) of 0.5 error margin. The 0.5 error margin is recommended scientifically and is accurate for determining the sample size of the research. DAFF (2021) reported that the population of cattle farmers in Sinthumule-Kutama areas is 940. Referring to Krejcie and Morgan (1970) sample estimation table, the sample size of this study based on the population found was 248.

Both the population and the sample size were used to calculate the total number of cattle farmers to be selected for interview in each of the nine villages. The sample size of all Sinthumule – Kutama villages was found to be 248 and considering time, the study focused on nine (9) villages which were selected randomly from 18 villages.

3.6. Sampling methods

One sampling method was implemented in this study namely, random sampling method. This sampling method was used to select the emerging cattle farmers since the study was targeting emerging cattle farmers. All available cattle farmers in each village were given an equal chance of being selected for interview, for example at Madombidzha village, the number of farmers to be involved in this study for interview was 9, therefore any cattle farmer that the researcher came across was given a chance to be interviewed.

In other words, first ten cattle farmers who were reached in that village were the ones to be interviewed for data collection.Random sampling gave the researcher an opportunity to select any farmer without any sequence or order. The researcher selected any emerging cattle farmer she came across. The researcher selected cattle

farmers specifically emerging farmers, the selection was based on their farm condition (few numbers of livestock, lack of farm technical resources, rural farmers etc.).

According to Nkosi (2017) emerging farmers are defined as farmer's lack who access to formal markets, technical knowhow, and management skills for risk and farming and they are mostly from previously disadvantaged communities. According to Horvitz and Thompson (1952) Probability to sample size is one of the methods used to calculate n13mber of respondents in each subgroup or unit to be involved in a study. This method was used to calculate number of farmers to be selected for interview from each village.

The sample size of each village was calculated by dividing the total number of cattle farmers in a specific village with the population of farmers (940) in all 18 villages and multiple it by the sample size (248). The sum of calculated samples from all 9 villages was the sample size of this research study (the number of cattle farmers to be interviewed in this study).

In 9 villages of Sinthumule – Kutama selected randomly, the total number of farmers who were supposed to be involved in this study is 67 but time allowed extra 13 farmers to be interviewed. In total 80 farmers were interviewed. Nine villages were selected randomly from eighteen villages of Sinthumule-Kutama. For example, in village 1 (MADOMBIDZHA), the number of farmers interviewed was 9.

<u>The calculation of probability to sample size sampling method:</u>

Sample size=248

Population of cattle farmers in 18 villages =940

No of respondents per village = $\frac{total\ no\ of\ ECF\ in\ a\ specific\ village}{population\ of\ all\ ECF\ of\ sinthumule-kutama\ illages} \times$ sample siz

e.g., No of farmers who were interviewed at village 1 (Madombidzha) =$\frac{33}{940} \times 248$

= 9

Therefore 10 farmers were selected for interview at Madombidzha village.

Key word: ECF = Emerging Cattle Farmers

Table 3.1: The actual sample sizes for each of 9 Sinthumule-Kutama villages

Sinthumule-kutama villages	Number of emerging cattle farmers	Number of (farmers) to be interviewed.
1. MADOMBIDZHA	33	9
2. TSHIOZWI	26	7
3. HA- RAMANTSHA	23	6
4. TSHILWAVHUSIKU	30	8
5. MADABANI	27	7
6. HA-MADODONGA	44	12
7. TSHIKWARANI	21	6
8. ZAMENKOMSTE	26	7
9. MAEBANI	18	5
TOTAL	248	67

3.7 Data collection

Letters to authorise for permission to conduct a study were written and submitted to the university of Limpopo (TREC committee), department of agriculture ,land reform and rural development, Sinthumule tribal council and lastly Kutama tribal council.

The study was carried after receiving the permission from the university of Limpopo (TREC certificate attached). Department of agriculture, land reform and rural development (Vhembe district) also gave the permission to conduct a study as this study was wanted the researcher to interact with farmers about extension advisors.sinthumule tribal council and Kutama tribal council also gave the permission to conduct a study .All these 4 approval letters are attached under appendices.

Interviews were used as a technique and questionnaire as a tool for this study.The present study was carried out through personal interviews because personal interviews enable the researcher to observe the attitude, behaviour, and conditions of farmers (respondents) meantime these factors helped the researcher to relate what

farmers are saying with their reaction (it supported with farmers perception's understanding). The questionnaire was guided by the objectives, and it was designed to address the concepts of cattle welfare and perception of farmers on an extension and advisory services. The questionnaire was relevant to the respondents involved in the study.

The research questionnaire had 3 sections. Section A wanted to capture the descriptive characteristics of farmers, Section B, wanted to capture cattle welfare practices and knowledge of farmers and the last section (Section C) wanted to capture the perception of farmers on extension and advisory services in improving their cattle welfare and the support farmers get from extension agents regarding their cattle welfare.

The target sample for the study was 67 but because of time and availability of farmers, 82 farmers were interviewed and 2 questionnaires were discarded as they did not have all questions answered as expected(unfairness/bias) .Data captured and used for this study is from 80 questionnaire ,which means 80 farmers were part of this study. Data collection period was one month (it took one month for all 80 questionnaires to be completed). This study used semi-structured questionnaire (which includes both open- ended questions).

3.8. Data analysis

The statistical instrument that was implemented for analysis was Statistical Package for Social Science (SPSS) version 26 of 2022. Descriptive analysis was used to address the socio-economic characteristics of respondents (emerging cattle farmers). Descriptive analysis gives a summary of data collected in a clear and understandable way by using graphs and numerical procedures. All the data that was in numbers, categories, scale, etc was captured in the analytical tool for analysis and the summary of results in percentage was released.

The study made use of the quantitative analytical tool which also analysed some of the qualitative data.The qualitative data was summarised, categorised then entered to the SPSS as quantitative for analysis,The results were calculated and presented in percentages, therefore these results were used when interpreting, discussing and reporting the results as they were representing interviewed farmers.

Mean score was used for analysing the perception of emerging cattle farmers on extension and advisory services. Seven statements regarding perception were presented to emerging cattle farmers for them to rank on the scale of 5 (1= very poor; 2= below average; 3= average; 4= above average; 5= excellent). The average mean score for every statement about perception is 2.5.

In this case, if the mean score is greater than 2.5 then that represents that the opinion of farmers suggest that agricultural extension and advisory services is important and needed in that statement regarding cattle welfare while less than 2.5 mean score will represent that the opinion of farmers suggest that agricultural extension and advisory services is not needed and not important in that certain statement regarding cattle welfare.

3.9 Ethical considerations

Dumisa (2010) defined ethics in research as the expected common rule of behavior while conducting research. The following aspects were considered as we engage in addressing the research question:

3.9.1 Permission

Permission to carry out the study was sought from the Turfloop Research and Ethics Committee (TREC) prior its commencement. The research study was conducted following the rules and regulations of Turfloop Research and Ethics Committee (TREC). The researcher seemed permission to collect data from Department of Agriculture, Forestry and Fisheries (Makhado Local Municipality), Sinthumule-Kutama tribal councils and from farmers before commencement of the study.

3.9.2 Respect, dignity and standard of care

The researcher respected all participants. The participant's time was valued and the interview took place only when participants were free and willing to be interviewed. The researcher used appropriate, respectful words and tone to avoid offending participants. The questionnaire (data collection tool) has socio-economic factors in a rank form to make farmers feel free comfortable to give answers as they were not providing direct answers and it helped in maintaining participant's dignity as well as making them feel not offended.

Researchers asked whether participants are willing to talk about their perception towards extension and advisory services without putting them in awkward situation. All emerging cattle farmers rules and secrets were respected. Participants who do not understand and who cannot read English were interviewed in their home language which is Tshivenda, and the researcher helped them with signing the consent form. Standard of care was considered in this study; Therefore, participants were treated with pride, and their rights as well as welfare were ensured.

3.9.3 Inform consent

The researcher informed participants that their participation is voluntary and that they are permitted to withdraw from the interview at any time without punishment. They were also informed that they have the privilege to acquire the results of research on the off chance that they so wish. Participants were asked to sign a consent (agreement) form to show that they agreed to participate in the study.

This agreement form includes details of what the research is all about, has in writing the details of what the research entails such as the potential benefits, the importance of their participation and highlight that their participation is voluntary.

3.9.4 Privacy

The researcher provided one on one session with the participant so that other people do not hear the conversation and it made respondents feel comfortable and answer freely.

3.9.5 Confidentiality and anonymity

Confidentiality and anonymity were considered in this study. The qualitative study gives an opportunity for the researcher to experience the participant's perceptions and knowledge about the sensitive issues. The participant's name and information remained confidential. The data collected from farmers (respondents) was used for the purpose of this study only and not for the other reasons.to achieve confidentiality and anonymity.

The study used code on data documents when recording data so that the information provided by participants cannot be traceable on them and aggregate findings were reported instead of individual household's level data. The researcher informed

participants before they agree to participate in the study the terms mentioned above. However, there were no financial benefits for participants and the researcher.

3.9.6 The benefits and protection from harm/Risk

The researcher protected harm and risk by providing the participants with the right to withdraw from the study whenever they do not feel comfortable in answering questions and by hiding their identities. Participants who experienced unforeseen situations were allowed to postpone the date for the interview. Participants were informed before commencement of the study that no payments will be made for participating in the study and they were asked if they wish to receive the report and how do they wish to receive the report.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This chapter discuss the findings of the study based on the aim and stated objectives. The results and discussion of this study is based on the interviews conducted with 80 Sinthumule-Kutama emerging cattle farmers. The objectives of this study were to: 1). To describe the socio-economic characteristics of the emerging cattle farmers in Sinthumule-Kutama areas of Makhado Local Municipality., 2) To determine the perception of Sinthumule-Kutama emerging cattle farmers on extension and advisory services in improving the welfare of their cattle., 3.) To determine the contribution of extension activities in improving the knowledge of emerging cattle farmers on how to improve their livestock welfare in Sinthumule-Kutama areas of Makhado Local Municipality and 4.) To find out whether the emerging cattle farmers receive support from the extension advisors regarding their cattle welfare in Sinthumule-Kutama areas of Makhado Local Municipality.

To discuss the results of this study, this chapter is organised into the following themes: (4.2) Socio-economic characteristics of the farmers, (4.3) The perception of farmers on agricultural extension and advisory services, (4.4) Extension activities contribution to farmers knowledge of cattle welfare improvement and (4.5) Support received by farmers from extension agents regarding their cattle welfare.

4.2 Socio-economic characteristics of emerging cattle farmers

4.2.1 Gender of the emerging cattle farmers in Sinthumule-Kutama

Emerging cattle farmers were asked to reveal their gender and the results are stated in Figure 4.1.

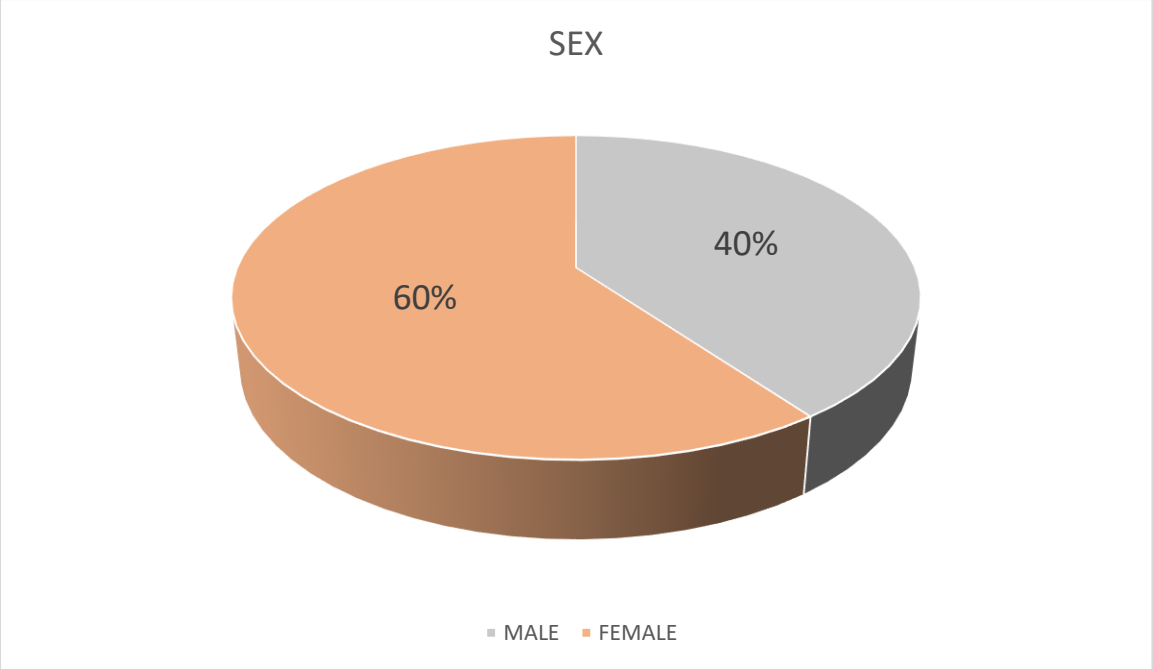

Figure 4.1: Gender of emerging cattle farmers

Figure 4.1 shows that majority of emerging cattle farmers of Sinthumule-Kutama are female (60%) and (40%) were found to be male. Majority of the female farmers mentioned that they took over cattle farming from their late husbands, while some inherited their cattle from their parents. Most of those females are engaged in cattle farming because they are unemployed, and farming is part of their source of the income as they were traditionally not allowed to go to school and to go to work back then. Most of the male farmers bought their cattle with their salary and some used their pension money while few inherited their cattle from their late parents.

Mudzanani (2019) gave similar results where majority of cattle farmers were found to be female. Thagwana (2009) shared the same sentiments that it has been a long trend that women have come to dominate farming in the Limpopo province. The reason why women are dominating cattle farming is because majority of them are uneducated and were not allowed to get qualifications with a believe that they will be smarter than their husbands, this influenced them to engaged in farming as they did not have any source of income. Women were given a role of taking care of livestock while their brothers/husbands are at work.

Except the fact that some of the women inherited their cattle from parents and husbands one other reason for women dominance in cattle farming might be the fact

that their husbands are working in cities and in other provinces and they are left with the responsibility of taking care of cattle.

4.2.2 Age categories of the emerging cattle farmers in Sinthumule-Kutama

Sinthumule-Kutama emerging cattle farmers were asked to indicate their age and the results are indicated in Figure 4.2.

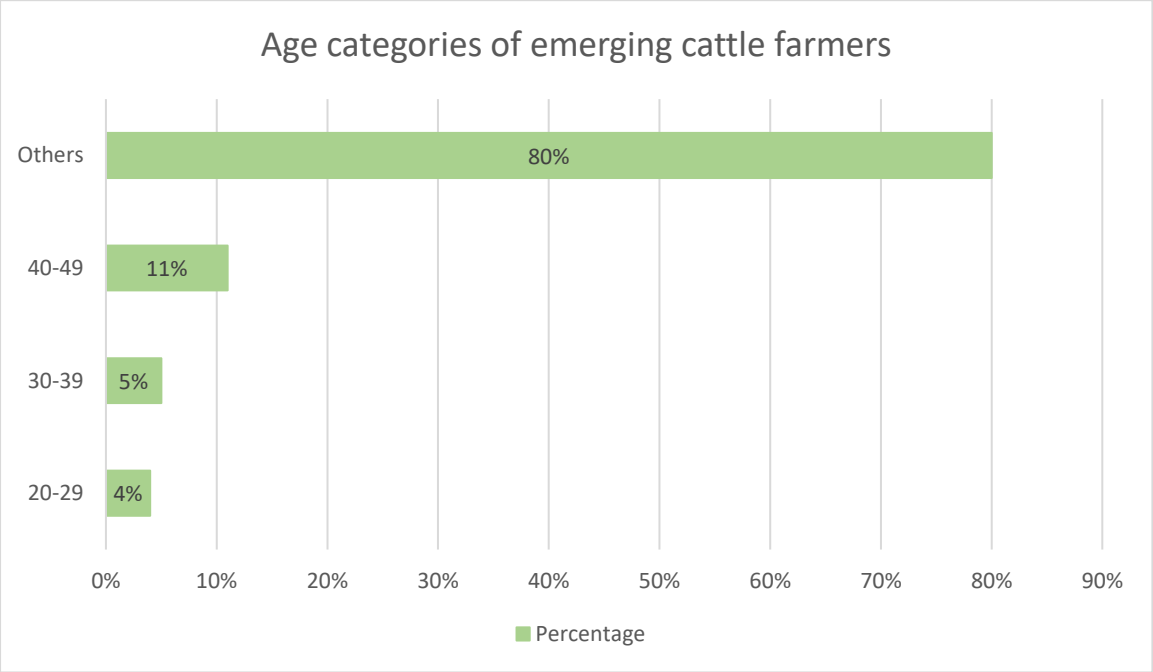

Figure 4.2: Age categories of Sinthumule - Kutama emerging cattle farmers

Figure 4.2 indicates that majority of emerging cattle farmers (80%) are older than 50 years. Moreover, majority of those farmers were found to be more than 60 years as they are on social grant. Slightly more than 10% of the farmers were of the age category (40-49), followed by 5% of the age category (30-39). Slightly below five percent of the cattle farmers were youth.

These results are supported by Nkosi (2017) who reported that majority of farmers are above 60 years of age (73%) and further reported that those with the age less than 35 years were very few with 1%. This might support the perception that most of young people are not interested in agriculture as they were found not participating in farming.

4.2.3 Marital status of emerging farmers in Sinthumule-Kutama

Emerging cattle farmers were asked to indicate whether they are married, single, divorced or widowed and the results are presented in Figure 4.3.

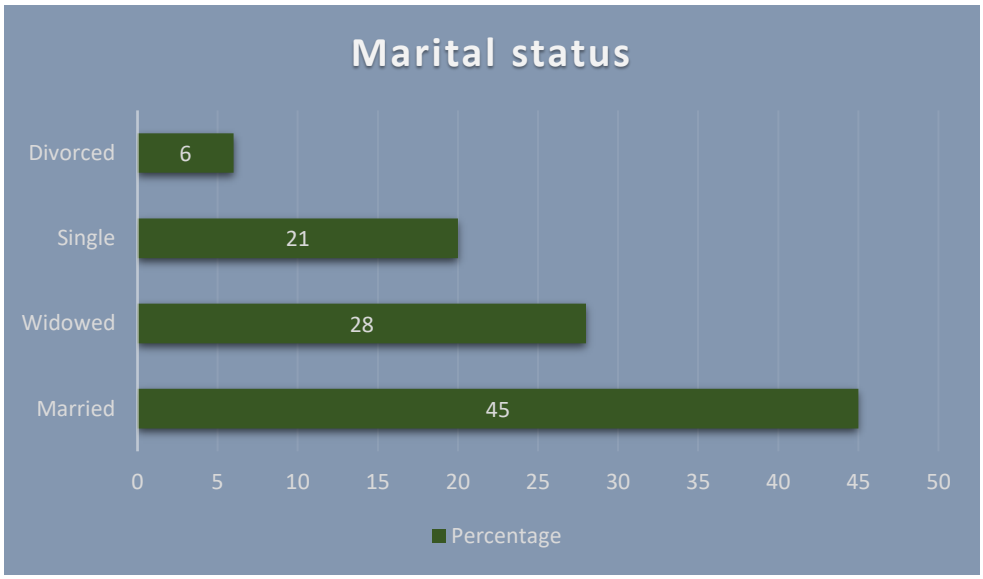

Figure 4.3. Marital status of emerging cattle farmers

Figure 4.3 highlights that most emerging cattle farmers were married (45%) while 28% of the farmers were widowed. About 21% of the farmers were single while only 6% of the farmers were divorced. Several studies recorded similar results when it comes to the marital status of farmers. Mampane (2019) reported that majority of smallholder cattle farmers were 73% married, followed by 17% single farmers and followed by 10% widowed farmers. Omotayo (2011) and Nkosi (2017) reported similar results where majority of cattle producers were found to be married.

4.2.4 Educational level of emerging farmers in Sinthumule-Kutama

Emerging cattle farmers were asked to indicate their highest qualification (educational level completed) and the findings were recorded in Figure 4.4.

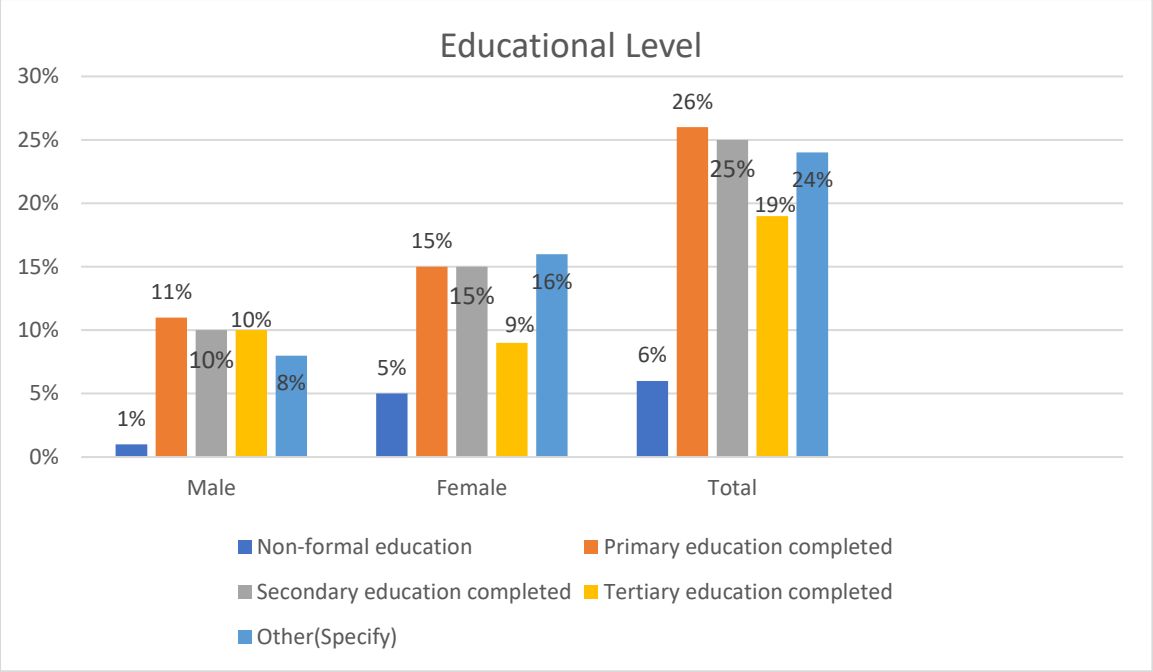

Figure 4.4: Educational level of emerging cattle farmers

Figure 4.4 shows the results of emerging cattle farmers' educational level. Most of farmers (26%) had primary education as their highest qualification while 25% of farmers completed secondary schooling. About 24% of the farmers did not go to school at all. Only 19% of the farmers managed to complete tertiary education while slight below five percent of the farmers managed to go through Non-Formal Education and these are the farmers who went for ABET and some also stated that they were imparted by their family members on how to read and write.

Male farmers had access to education as compared to female farmers**.** Traditionally women were not allowed to go to school in the past however the situation is changing now due to the availability of various types of education provided by various development organisations. The results further indicate that majority of female farmers did not go to school at all (other) with 16% while most of male farmers were found to be more educated as they have completed tertiary education (10%).

Majority of the current study had primary education completed. These findings differ with findings recorded by Nkosi (2017) who reported 93% of farmers not having a formal education and very few having primary, secondary and tertiary education.

4.2.5 Employment status of emerging farmers in Sinthumule-Kutama

Emerging cattle farmers were asked about their status of employment and the results are summarized in Figure 4.5. According to Figure 4.5 below majority of cattle farmers (34%) are pensioners and most of them rely on social grant. The findings of the study revealed that 31% of the farmers are unemployed because of job scarcity and old age reasons such as medical conditions. About 14% of the farmers are doing casual/piece jobs, some of them are selling goods to local people.

Slightly more than 10 % are full-time livestock farmers who claimed to be having cattle farming as their source of income, they are engaged in different livestock farming (some had pigs and goats also) and some are also engaged in crop farming as well. About 6% of farmers are working full-time, these farmers are also working somewhere else, and they are just interested in farming while 4% were found to be part-time workers.

Most of farmers were found to be pensioners, they are engaged cattle farming because they no longer working and farming is a way of keeping them busy while marking an extra cash from it.

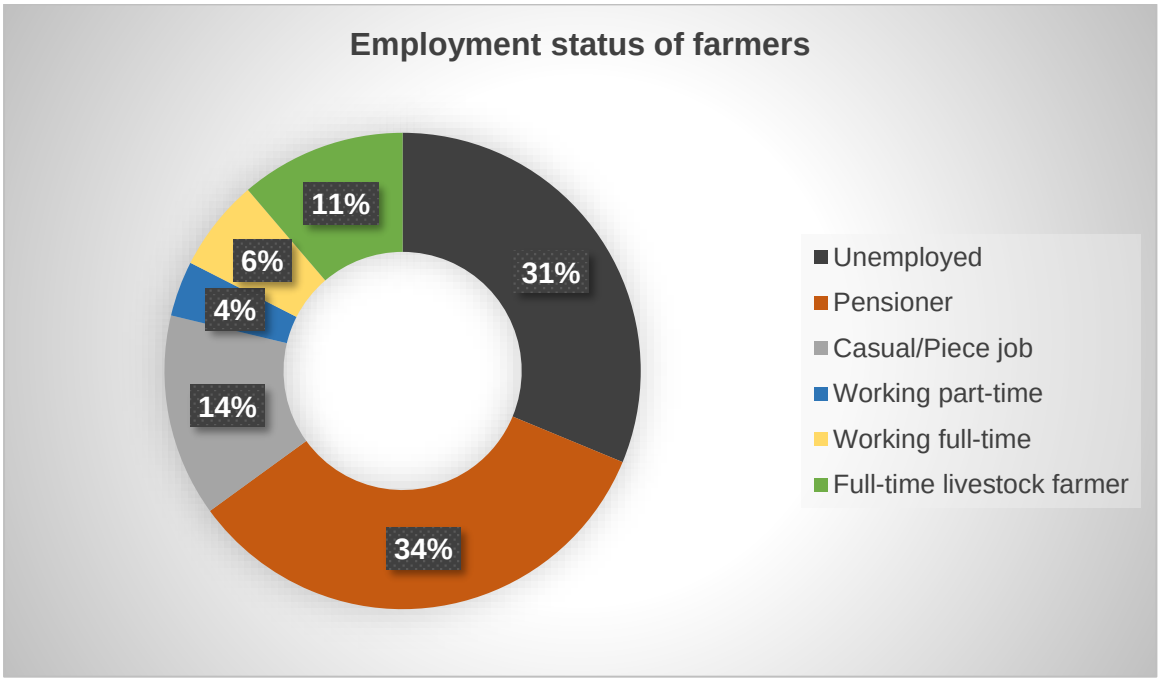

Figure 4.5: Employment status of emerging cattle farmers

4.2.6 Type of cattle owned by emerging farmers in Sinthumule-Kutama

Emerging cattle farmers were asked to select the reason they are engaged in cattle farming and their responses were recorded in Figure 4.6.

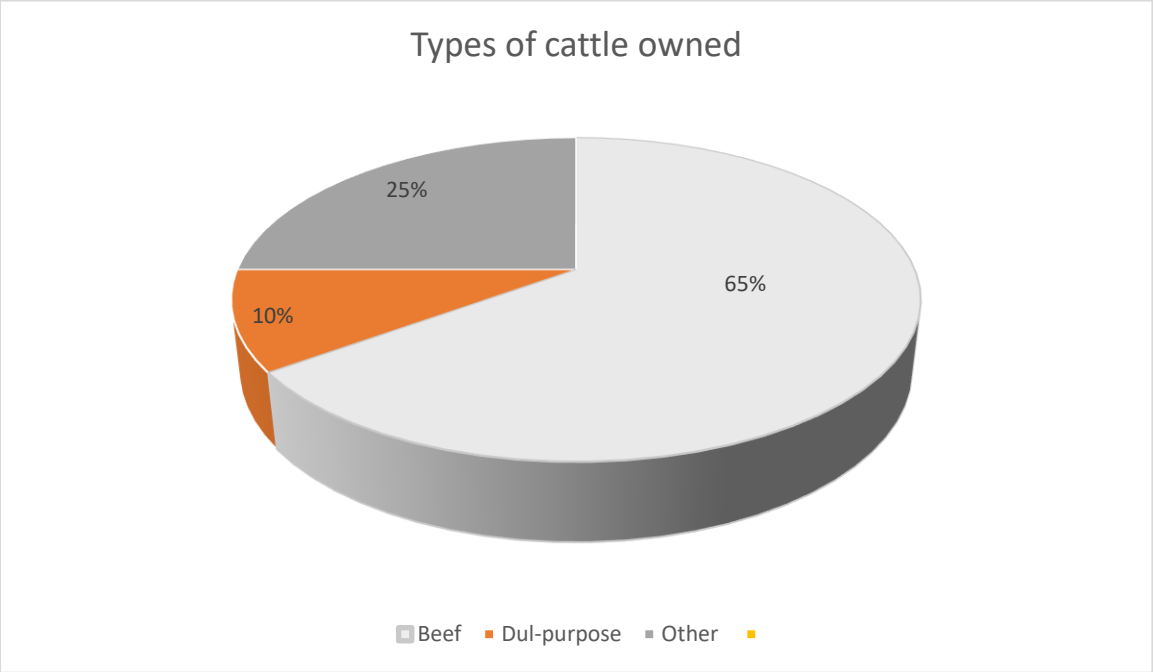

Figure 4.6: Types of cattle owned by emerging farmers in Sinthumule-Kutama

The results of the study regarding cattle ownership on Figure 4.6 show that majority of farmers with 65% kept their cattle for beef production as they also sell their cattle to butchery owners while 25% of the farmers stated that the purpose of their production is to sell their livestock to commercial farmers in the meanwhile, they do not know what commercial farmers do with their cattle.

On the other hand, among these 25%, some farmers also highlighted that they slaughter their livestock for family related events, to avoid buying the meat. About 10% of the farmers indicated that the purpose of their production is both for milk and beef production as they slaughter their old livestock and sell the meat and milk to their neighbours.

4.2.7. Source of income of the emerging farmers in Sinthumule-Kutama

The results shown by Figure 4.7 indicate the source of income of emerging cattle farmers in Sinthumule-Kutama.

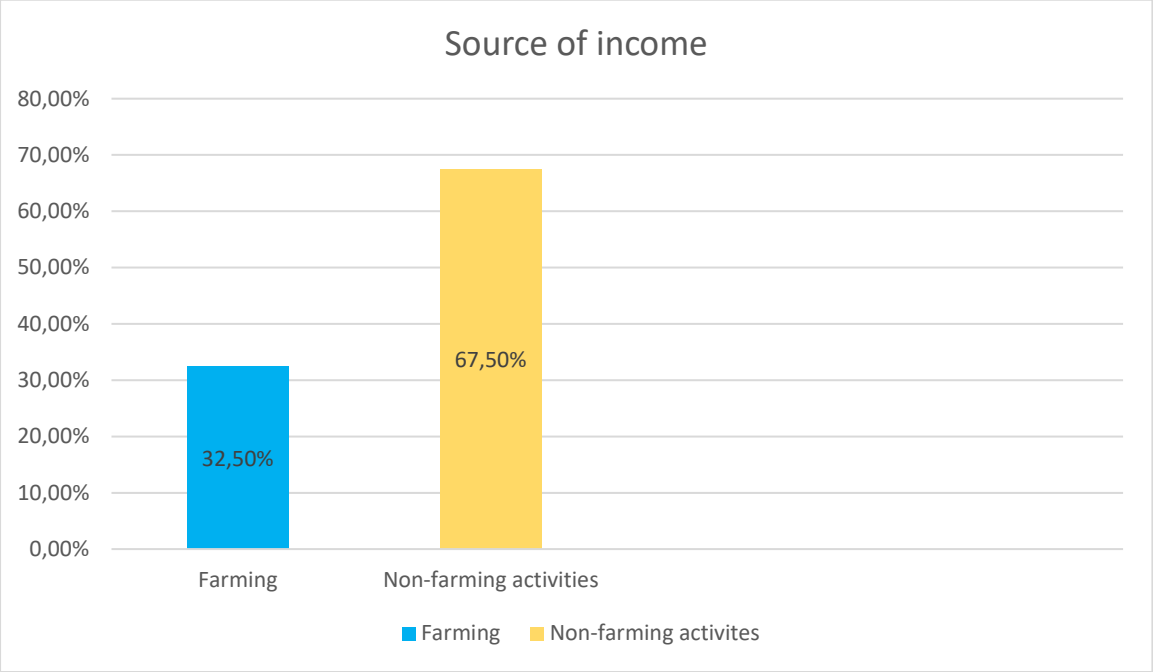

Figure 4.7. Source of income of emerging farmers

The findings of the study show that 67.50% received their income from non -farming activities while 32.50% of the cattle farmers claimed to be getting their income from farming, most of these farmers were found to be practising mixed farming (crop and livestock production) and also producing different livestock. Farmers might be also engaged in non-farming activities to gain extra money so that they can maintain their families and improve their livelihoods.

4.2.8 Type of labour used by the emerging cattle farmers in Sinthumule-Kutama

Emerging cattle farmers were asked what type of labour they are using in their farm / herds and the results are presented in Figure 4.8.

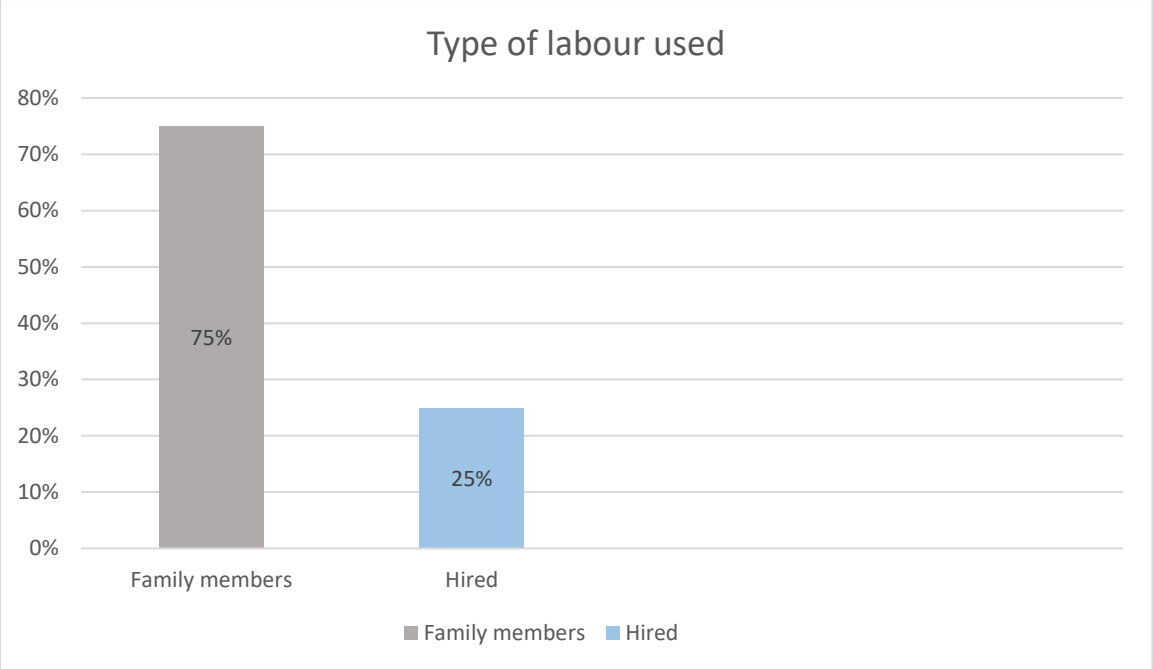

Figure 4.8: Types of labour used by emerging farmers

The findings in Figure 4.8 indicate that majority (75%) of emerging cattle farmers are using family members as labour in their cattle farming while 25% of the farmers showed that they have hired labours. It was reported that family labour assists with taking care of cattle if the owner is not available during a time of need. Among 25 % of emerging farmers, most of them reported that they hired labours due to various reasons such as old age (poor medical state) and some are having full-time jobs and they do not have time for their cattle.

This tends to be a practically evidence that majority of these cattle farmers receive most of their source of income from non-farming activities as pointed out in Figure 4.7. These farmers mostly prefer family labour as Mampane (2019) puts it that the smallholder cattle farmers were found preferring family labourers in their cattle farming and they highlighted that they prefer using family labourers to minimise labour cost.

Mampane (2019) found similar results as reported that majority of cattle farmers use family members as farm labours while the results by Mbongeni *et al.* (2017) were opposite to the findings of this study and Mampane's study as they indicated that a considerable number of cattle owners hire workers to look after their livestock.

4.3 The perception of farmers on extension and advisory services

4.3.1 Perception of the emerging farmers on the importance of cattle welfare

Emerging cattle farmers were asked to indicate how important is cattle welfare by selecting from a five point-Likert scale on the importance of cattle welfare where 1 represent “Not important” and 5 means “Extremely important”. The findings are presented in Figure 4.9.

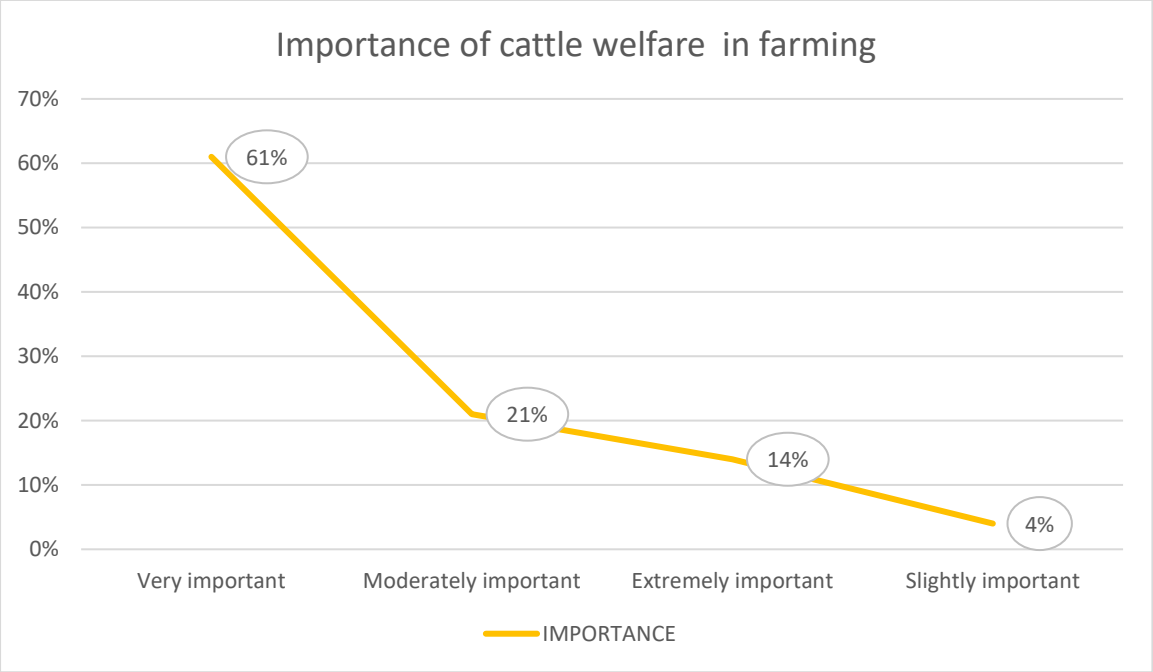

Figure 4.9: Perception of emerging farmers on the importance of cattle welfare

The results of the study on Figure 4.9 indicate how emerging cattle farmers in Sinthumule-Kutama perceive the importance of cattle welfare in farming. Majority of farmers (61%) perceived cattle welfare as very important aspect in cattle farming while 21% of farmers perceived cattle welfare as moderately important. Slightly a quarter less of farmers (14%) perceived cattle welfare to be extremely important while 4% of farmers perceived cattle welfare as a slightly important aspect in cattle farming.

Those who mentioned that cattle welfare is slightly important with 4% did not see their cattle welfare as an important factor in farming, they believed that cattle welfare is the least to focus on in cattle production. They stated that feed and water are the only important inputs in cattle production. Among the 4%, some mentioned that they do not

vaccinate nor inject when their cattle are sick as they believed that cattle welfare is slightly important.

Moreover, Mugogovhali (2011) revealed that emerging farmers are aware of cattle welfare management and it is importance because very few farmers (12%) were not controlling parasites and vaccinating in their herds. Most of the farmers were found to be using both scientific and traditional medication to treat and prevent their cattle from diseases. They used plants like Alchornea schlechteri pax shrub and aloe to treat heartwater by mixing it with drinking water.

Some wash wounds and injured part with water mixed with salt or with aloe mixed with water. During dry season, some add salted water to feeds while some use aloe mixed with drinking water to treat intestine parasites such as stomach worms, tapeworms and lung worms.

4.3.2 Perception of emerging farmers on their knowledge of cattle welfare

Emerging cattle farmers were asked to rate in a five-point Likert scale, how knowledgeable they are about cattle welfare. The findings are presented in Figure 4.10.

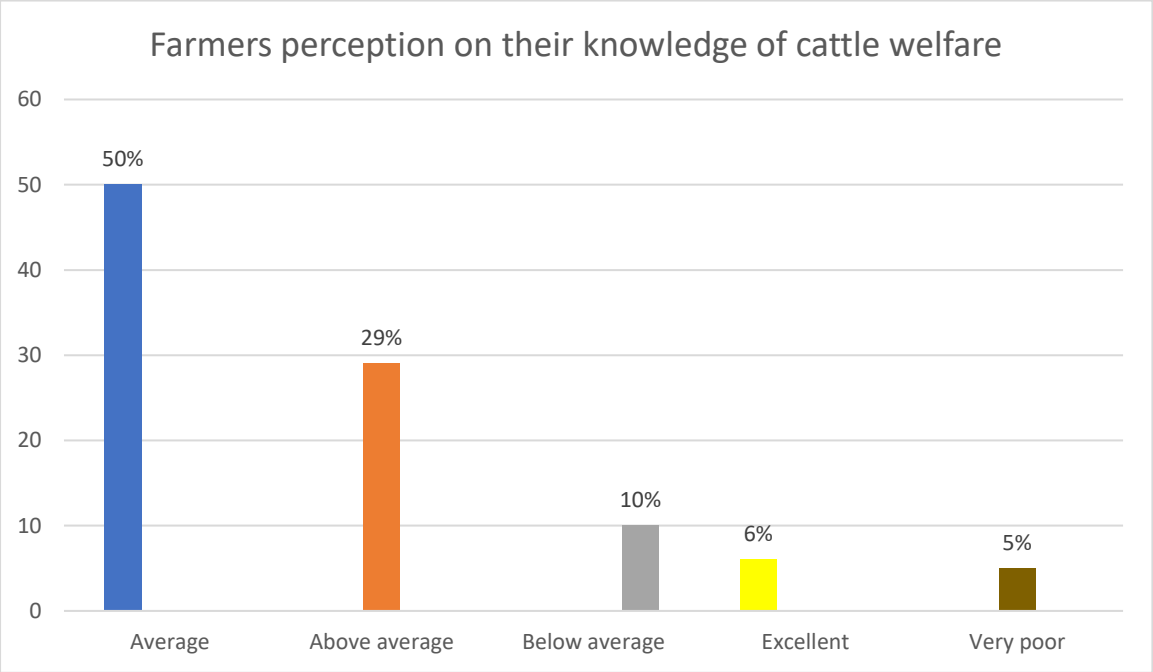

Figure 4.10: Knowledge of emerging farmers on cattle welfare

Figure 4.10 highlights the results of farmer's perception on their knowledge of cattle welfare. The results of the study indicate that half (50%) of the farmers believed that their knowledge about cattle welfare is average while 29% of the farmers believed that their knowledge on cattle welfare is above average. Only 10% of farmers believed that their knowledge on cattle welfare is below average and 6% of the farmers believed that their knowledge about cattle welfare is excellent.

These farmers believed that their perception is excellent as they can identify a sick animal, they know when to vaccinate for which diseases and the lastly 5 % of respondents believed that their knowledge on cattle welfare is very poor. Those farmers mentioned that their knowledge is poor as they do not know what different symptoms indicate and which medication to use for different symptoms, some perceived their knowledge that way as they were relying on other people for cattle welfare practices and some also mentioned that they cannot even identify a sick animal.

Mbongeni *et al*. (2017) also reported that majority of cattle farmers with 20% turn to other farmers when their animals are sick for help, while few of them with 18% go to community animal health service and 11% go to state veterinary. Most of cattle farmers (24%) who turned to state veterinaries are those who have lost their animal to diseases but only less of them turned to community animal healthcare centres (Mbongeni *et al.*, 2017).

These findings show that majority of cattle farmers are not knowledgeable about cattle welfare and its practices as they rely on other bodies for help and this can affect their production. This might be the case more especially if they do not get help in time, it can lead to death (high mortality rate). However, if they were knowledgeable enough, they can assist their animal and have healthy livestock in their herds.

4.3.3 Visits by extension agents and agricultural advisors

Figure 4.11 below indicates the results of how frequent do extension agents visit to emerging cattle farmers.

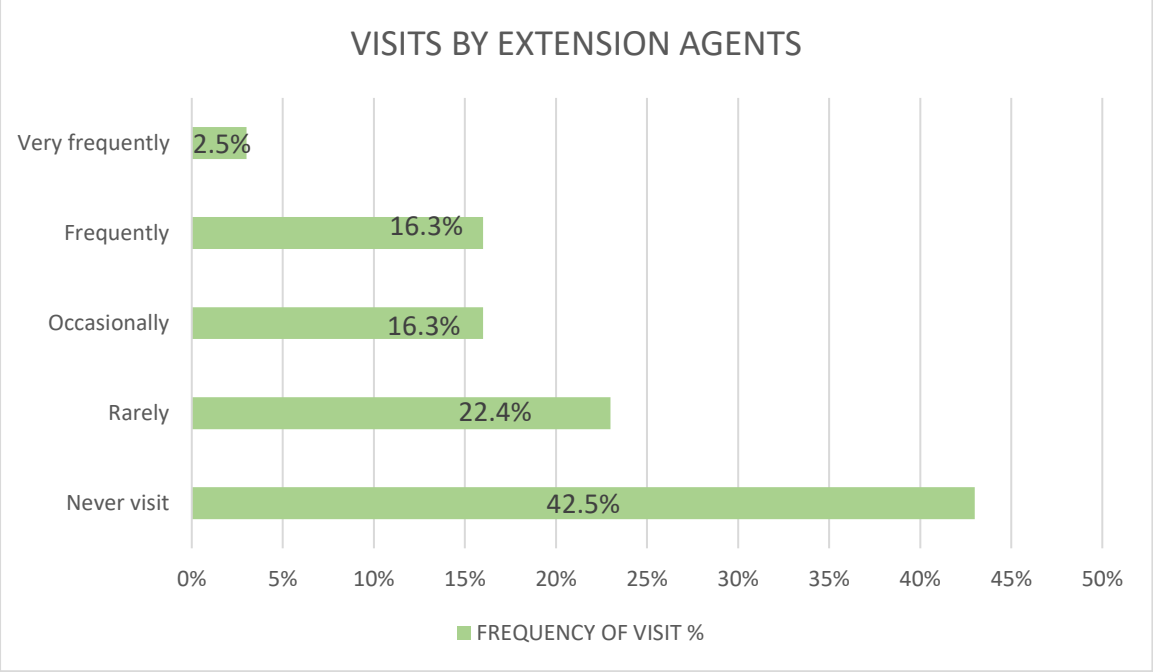

Figure 4.11: Visits by agricultural advisor

The findings of the study indicate that slightly below half of the farmers (43%) are of the opinion that the extension agent never visits them, while about 22% of the farmers are of the opinion that extension agents rarely visit them. The results also highlight that an equal share of percentage (16%) of farmers are of the opinion that extension workers visit them occasionally while the other 16% of the farmers are of the opinion that extension workers visit them regularly.

The farmers revealed that the occasional visit by the extension workers is only possible when extension workers help them with completing forms and on preparations for farmer's day. The results of the study further revealed that less than five (3%) of the farmers indicated that they visit them very frequently. Most of the farmers who are of the opinion that they get visited frequently are committee members whom extension workers do visit them in their farm/herds to inform them about the planned meeting and progress of activities already done. They further highlighted that

they come to them to give them medication every season so that they can distribute to other farmers of their village

4.3.4 Perception of emerging farmers on the effectiveness of the extension approaches.

Figure 4.12 below shows the rate of emerging cattle farmers on the effectiveness of the approaches used by extension agents (given on five-point Likert scale).

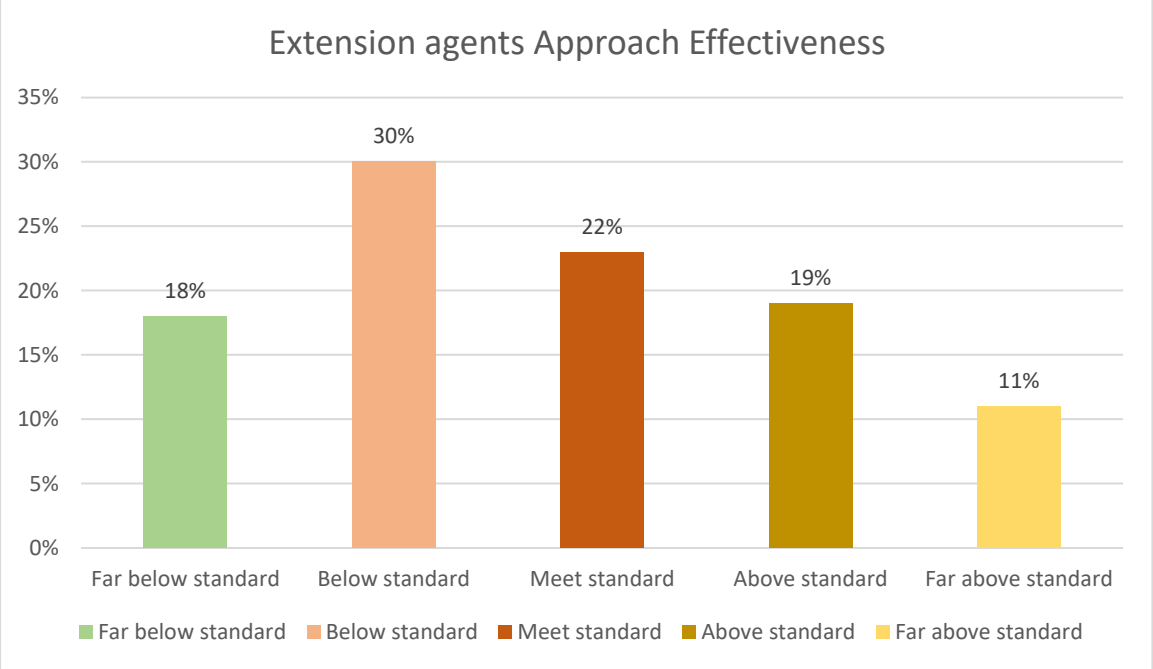

Figure 4.12: Effectiveness of the approach used by agricultural advisors

The results of the study show that majority of farmers stated that extension agents use project approach. The findings indicate that less than half farmers with 30% rated the effectiveness of the extension approach as below standard while 22 % of farmers agreed that the approach used by extension agent meet standards. About 19% agreed that the extension approaches are above standards while 18% of farmers agreed that the extension approaches are far below standards. Only 11% of farmers agreed that the extension approaches are far above standards.

Referring to Figure 4.12, majority of Sinthumule-Kutama emerging cattle farmers are not satisfied with the approaches used by extension agents as most of those emerging farmers indicated that the extension approaches are below standards.

4.3.5 Perception of emerging farmers on the importance of agricultural extension and advisory services in cattle farming

Farmers were asked to rate the agricultural extension and advisory services based on how important is in the welfare of cattle. The agricultural extension and advisory service importance was rated out of five (5) and the findings were recorded on Figure 4.13.

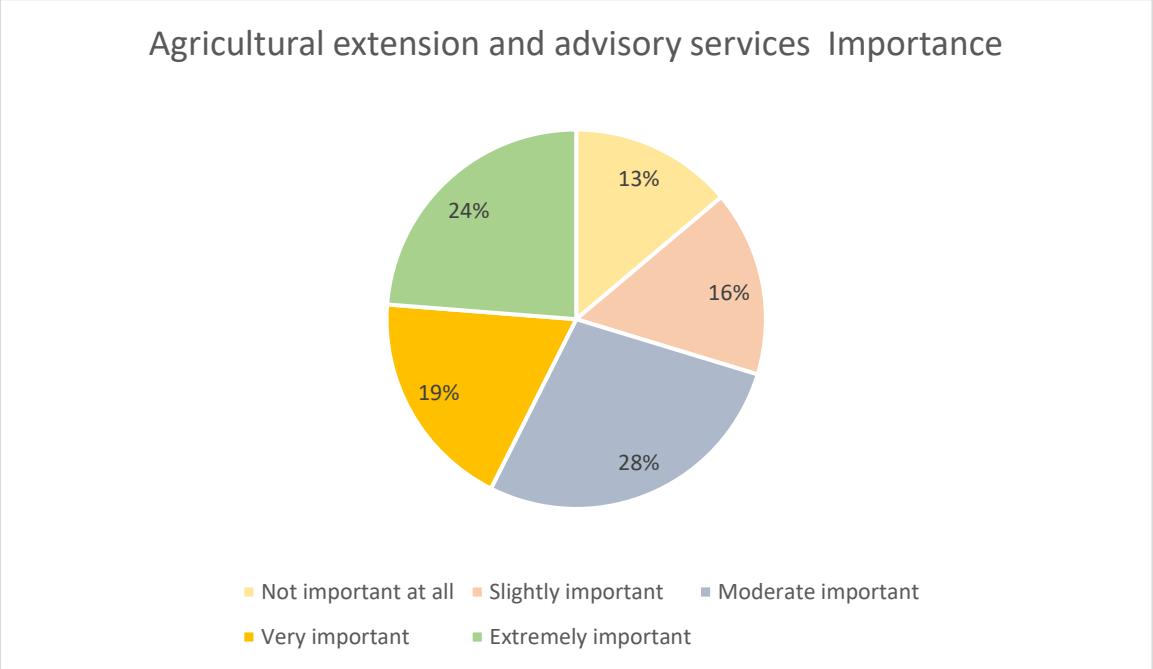

Figure 4.13: Importance of agricultural extension and advisory services in cattle farming

Figure 4.13 shows that the findings of the study revealed that about (28%) of farmers are of the opinion that agricultural extension and advisory services is of average quality (moderately important) while 24% of the farmers are of the opinion that agricultural extension and advisory services is of high quality and exceed what is usual (extremely important). The results also reveal that 19% of the farmers are of the opinion that agricultural extension and advisory services is very important while 16% of the farmers perceived agricultural extension and advisory services to be slightly important.

Only 13% of the farmers are of the opinion that agricultural extension and advisory services is not important at all. Those who rated agricultural extension and advisory services to be extremely important highlighted the fact that without extension agent,

they could not produce their cattle as they are doing currently. They further revealed that extension agents help them with a lot of things, including advice, knowledge and production inputs.

However, among those farmers (24%), who perceived agricultural extension and advisory services as extremely important are those farmers who receive the services and visit from extension advisors. The results above show the perception of the farmers towards the importance of agricultural extension and advisory services. The findings of the study reveal that majority of the farmers seemed agricultural extension and advisory services to be important in the welfare of their cattle.

This shows that farmers believe that agricultural extension and advisory services are very crucial in cattle welfare. This might also be symbolising that extension agents are useful and supporting emerging cattle farmers.

4.3.6 Perception of emerging farmers towards improvement of cattle welfare by agricultural extension and advisory services

Emerging cattle farmers were asked to discuss their opinion regarding agricultural extension and advisory services in helping them with improving their cattle welfare. Table 4.1 reflects the findings.

Table 4.1: Perception of emerging farmers on agricultural extension and advisory services in improving their cattle welfare

Statements	Mean	Standard Deviation
1.Farmers accessibility of cattle welfare (CW) information/knowledge	1.29	.455
2. Perception of farmers on their knowledge of cattle welfare	3.21	.896
3. Importance of cattle welfare in farming	3.85	.695
4. Frequency of visits by extension agents	2.14	1.209
5. Effectiveness of approaches used by extension agents	2.76	1.265
6. Importance of agricultural extension and advisory services according to emerging farmers.	3.23	1.350

7.Farmer's viewpoints on their participation on extension activities	2.05	.840

A five-point Likert scale was used to measure perception of emerging cattle farmers towards agricultural extension and advisory services. Seven statements regarding perception were presented to emerging cattle farmers for them to rank on the scale of 5 (1= very poor; 2= below average; 3= average; 4= above average; 5= excellent). The average mean score for every statement about perception is 2.5. In this case, if the mean score is greater than 2.5 then that represents that the opinion of farmers suggest that agricultural extension and advisory services is important and needed in that statement regarding cattle welfare while less than 2.5 mean score will represents that the opinion of farmers suggest that agricultural extension and advisory services is not needed and not important in that certain statement regarding cattle welfare.

According to Table 4.1 the findings of the study revealed that farmers agreed with the four statements regarding their perception on agricultural extension and advisory services. Agreeing with the statements shows that opinion of farmers suggest that agricultural extension and advisory services is important and is needed in their cattle welfare.

4.3.6.1. Opinion of farmers on the importance of cattle welfare in farming

The results also indicated that farmers agreed that animal welfare is important in cattle farming with the mean score of 3.85 and this shows that the opinion of emerging cattle farmers suggest that agricultural extension and advisory services is needed to help farmers improve their cattle welfare since it is important in cattle farming. These might influenced cattle farmers to attend extension activities that will assist them with improving their cattle welfare.

4.3.6.2. Opinion of farmers on the importance of agricultural extension and advisory services

Farmers also agreed that agricultural extension and advisory services are important in cattle farming with a mean score of 3.23 and it shows that the opinion of emerging cattle farmers suggest extension agents as important bodies in their cattle production.

This might also be influencing them to attend extension activities as they believe agricultural advisors are useful and that they will benefit more from them.

4.3.6.3. Opinion of farmers on their knowledge of cattle welfare

The results revealed that farmers agreed that they are knowledgeable about cattle welfare with the mean value of 3.21. This shows that farmers opinion towards their own knowledge of cattle welfare suggest that agricultural advisors are important and are needed to help them with knowledge regarding cattle welfare. However, this opinion might make them not require support from extension agents as they believe that they are knowledgeable enough.

4.3.6.4. Opinion of farmers on the effectiveness of approaches used by extension agents

The findings reveal that farmers further agreed that the approaches used by extension agents are effective with the mean score of 2.76 and this in dicates that opinion of emerging cattle farmers suggest that agricultural extension and advisory services approaches are benefiting and helping them improve their cattle welfare. This might encourage farmers to continue attending extension activities as they are satisfied by their approaches and their working strategy.

4.3.6.5. Opinion of farmers on frequency of visits by extension agents

The results indicate that farmers disagreed with statement that “Extension agents visit them frequently with the mean score of 2.14. This indicates that farmers opinion suggest that extension agents must visit them frequently as their visits are important in cattle farming “They can give us advice on what procedures and practices to implement for cattle welfare improvement after seeing our farm condition”.

This shows that farmers are not satisfied with the visits they are receiving from their extension agents and this might make them believe that agricultural extension and advisory services are not genuinely helping them with improving their cattle welfare as they do not visit them frequently.

4.3.6.6. Opinion of farmers on their participation on extension activities

Farmers also disagreed that their participation on extension activities is poor as the mean score was less than the mean score (2.05) and this might influence farmers

perception towards agricultural extension and advisory services. Emerging cattle farmers might believe that extension agents are not playing their role when it comes to helping them improve their cattle welfare because they do not attend extension activities.

4.3.6.7. Farmers viewpoints on their accessibility of cattle welfare (CW) information

Farmers disagreed that they have heard enough and crucial information about cattle welfare with their mean value of 1.29. Farmers opinion on their access to information regarding cattle welfare was poor and this suggest that extension agents are not important as they are not giving farmers important information to farmers regarding their cattle welfare improvement.

Most farmers further stated that they have heard about cattle welfare but the information is not enough. This might have contributed to the opinion farmers hold towards agricultural extension and advisory service as they believe that agricultural advisors are not giving them enough information regarding cattle welfare.

The findings reveal that farmers further agreed that the approaches used by extension agents are effective with the mean score of 2.76 and this indicates that opinion of emerging cattle farmers suggest that agricultural extension and advisory services approaches are benefiting and helping them improve their cattle welfare. This might encourage farmers to continue attending extension activities as they are satisfied by their approaches and their working strategy.

Opinions of farmers on most (five) statements suggest that agricultural extension and advisory services are regarded important and needed in cattle welfare improvement by emerging cattle farmers. This shows that emerging cattle farmers of Sinthumule-Kutama areas view agricultural advisors as important bodies in their cattle farming as most of their statements had the mean ranking scale greater than 2.5.

Farmers opinion might have been influenced by the services farmers are receiving from the extension agent in relation to their cattle welfare and this includes services such as medication and training. Livestock farmers were found to be holding a negative perception about the extension services quality rendered to them hence the study was focusing on female farmers only (Forbang *et al.,*2019).

According to Mampane (2019) small-scale farmers are having negative perception towards using the projects advised by extension advisors. This study was supported by Assefa, Van den Berg and Conlong (2008) study which revealed that the perception of farmers is very much important in cattle production as it can act as a constraint can influence farmers to adopt or not to adopt new technologies brought to them.

4.4 Extension activities contribution to farmers knowledge of cattle welfare improvement

4.4.1 Emerging farmers' awareness of cattle welfare

Emerging cattle farmers were asked if they have heard about cattle welfare and findings are represented by Figure 4.14.

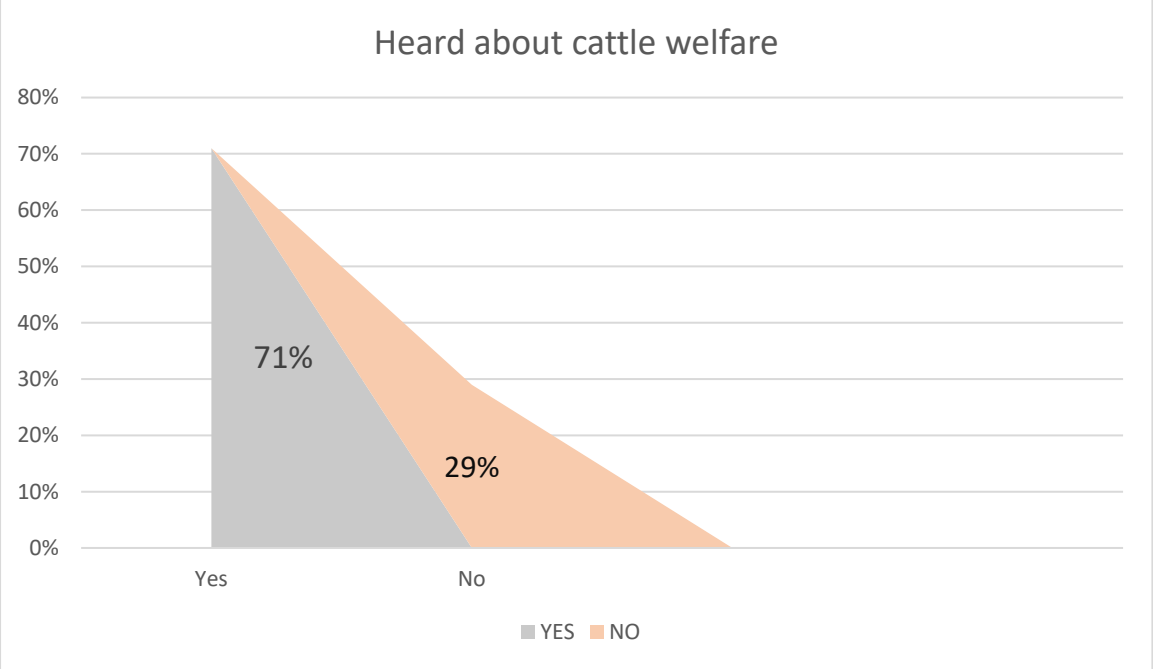

Figure 4.14: Awareness of emerging farmers about cattle welfare

Referring to Figure 4.14, majority of emerging farmers with 71% have heard about cattle welfare and they indicated that they have heard about cattle welfare from different sources while 29% of those farmers mentioned that they have never heard anything about cattle welfare. Some of farmers who have never heard about cattle welfare further disclosed that they cannot identify a sick animal and they believed that their knowledge on cattle health is very poor.

Some of farmers who revealed that they have heard about cattle welfare highlighted that they receive information about cattle welfare from extension agent "*they teach us about the symptoms of sick cattle in order for us to be able to identify a sick animal in our herds, they also teach us how to inject and when to inject".*

4.4.2 Emerging farmers 'access to agricultural extension advisory services

Figure 4.15 represent the results on whether emerging cattle farmer access agricultural extension and advisory services or not.

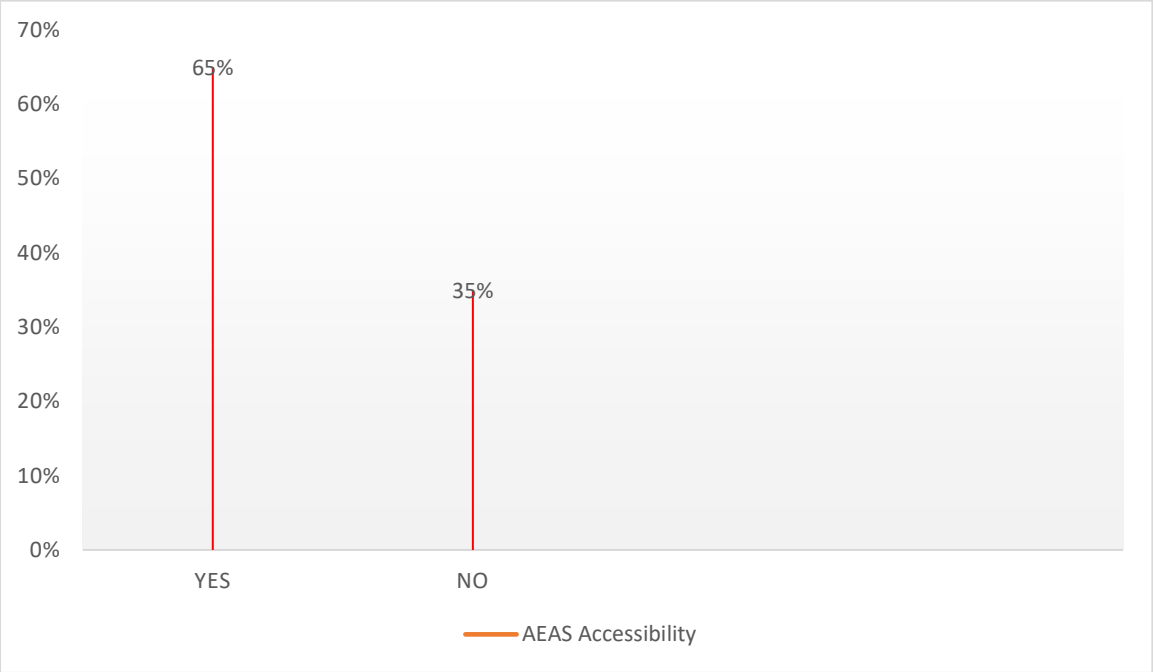

Figure 4.15: Agricultural extension and advisory services accessibility by emerging cattle farmers

From the results in Figure 4.15, it is revealed that majority of farmers (65%) do have access to extension agents and some of these farmers highlighted that they even go to agricultural advisor's office if they need help or for consultation. Some of the farmers revealed that they call agricultural advisors if they face challenges with their cattle. About 35% of farmers were found to be not having access to agricultural advisors.

Among this 35%, some mentioned that they do not know how to get hold of them as they do not have their phone numbers" only committee members have agricultural advisor's phone number" and they do not know where to get agricultural advisors when

they need them, while few mentioned that that do not know when agricultural advisors are coming.

Mampane (2019) recorded similar results who unveiled that majority of small-scale farmers with 62% had access to extension services and 38% did not access extension services. These findings are also like results recorded by Nkosi (2017) who reported that majority of emerging livestock farmers (more than 90%) rely on public extension and had access to those public extension while few emerging livestock farmers with 14% can afford private extension.

These findings shows that majority of emerging cattle farmers do access agricultural extension and advisory services. Most of emerging cattle farmers in Sinthumule-Kutama areas reported that they have heard about cattle welfare and this might have been influenced by the knowledge obtained from agricultural advisors when they visit emerging farmers.

This will contribute to improved healthy cattle production yield of emerging cattle farmers. Farmers access to agricultural advisors is very important in farming as they can receive important advice and information (knowledge) towards their livestock production (Enki *et.al.,* 2001).

4.4.3 Emerging farmers reasons for not accessing agricultural extension and advisory services

Emerging cattle farmers who do not access Agricultural Extension and Advisory Services were asked to give reasons why cannot they access agricultural advisors, and the results are presented on Figure 4.16. This was to see if their reason might contribute to their perception towards agricultural advisors.

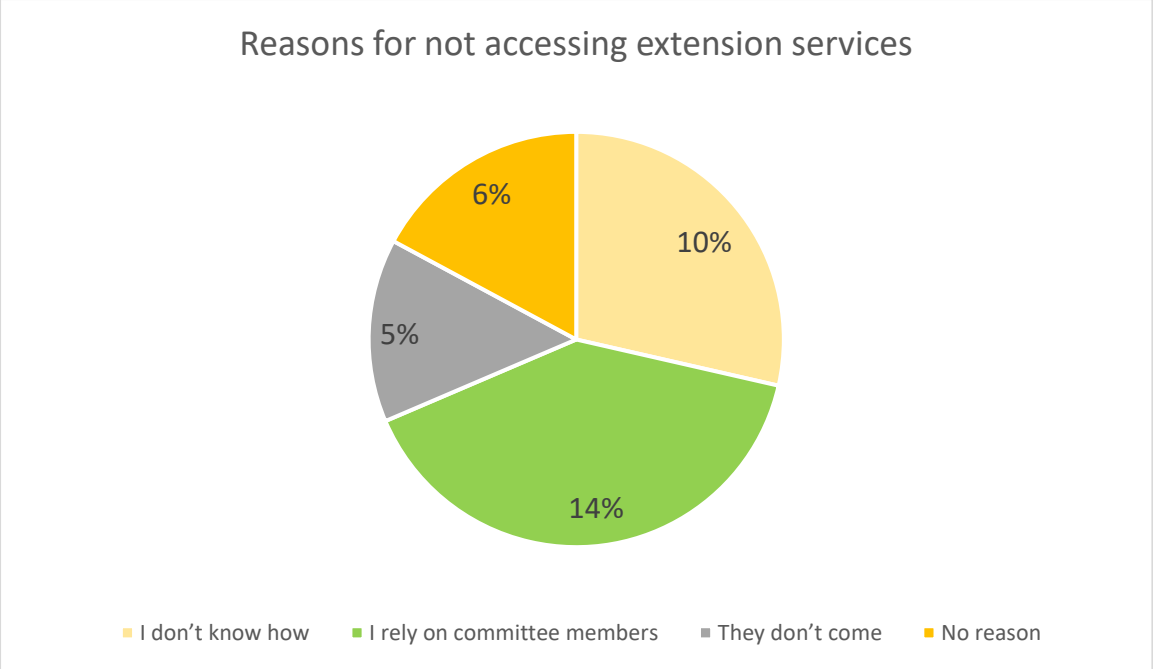

Figure 4.16: Emerging farmer's reasons for not accessing agricultural extension services

Referring to the results in Figure 4.16, 35% of the cattle farmers who participated in this study did not have access to agricultural advisors. According to Figure 4.16, Most of emerging cattle farmers (14%) who were found to be not accessing agricultural advisors rely on committee members when they face challenges with their cattle welfare while 10 % were found to be not having some knowledge on how they can access agricultural advisors.

About 6 % cattle farmers were found to be not having a reason for not accessing agricultural advisors while 5% of farmers were found to be not accessing agricultural advisors because they do not come to them. Majority of the interviewed emerging cattle farmers have access to agricultural advisors as they were found to be 65%. Emerging cattle farmer's lack of access to agricultural advisors might be because they chose not to participate in extension activities as most of them were found to be relying on committee members and this might make them unaware of the activities carried by extension agents.

4.4.4 Participation of emerging cattle farmers on extension activities

Emerging cattle farmers (65%) who have access to agricultural extension and advisory services were asked to rate their participation on extension activities and the results are summarized on Table 4.2.

Emerging cattle farmers rate participation on extension activities:	Percentage (%):
1.Poor	21%
2.Fair	20%
3.Good	24 %

Table 4.2: Participation of emerging cattle farmers on extension activities

The findings in Table 4.2 indicate that farmers who rated their participation as good were found to be 24% while 21% of farmers rated their participation as poor and only 20 % rated their participation with fair. Farmers who believe their participation on extension activities is good, further stated that it is because they attend agricultural extension meetings, training and workshops.

Farmers (21%) who believed their participation is poor further supported their rate by stating that it is because they do not attend all the activities carried by agricultural advisors (they rarely attend). Twenty percent believed their participation on extension activities is fair because they attend extension activities only when they are free, and some gave medical reasons for not attending activities every time.

Most of those who opted their participation as fair reported “I attend their activities, especially their meetings sometimes but sometimes I do not attend and I take time without attending”.

4.4.5 Services received by emerging farmers from agricultural advisor

Table 4.3 represents the results of whether emerging cattle farmers receive the services and advice from extension agents about welfare of their cattle and to indicate whether extension activities contribute to their knowledge of cattle welfare.

Statement	YES	NO
1. Receive services and advice from extension agents regarding cattle welfare	61%	39%
2. Contribution of extension agents activities to farmer's knowledge of cattle welfare	50%	11%

Table 4.3: Services received by cattle farmers from extension agent

Results in Table 4.3 show that majority of farmers with 61 % agreed to be receiving services and advice from extension agent on their cattle welfare *"They tell us when time is to inject and about the upcoming diseases"* while 39% disagreed that they receive services and advice from extension agents. Some of these who do not receive services from extension agents stated that it is because they do not have certificates and they are not registered with the government *"We do not have brandmark and a green book that is the reason we do not receive medication".*

From the results above, it can be confirmed that majority of farmers received services and advice from extension agents regarding their cattle welfare. Farmers who were found to be receiving services and advice from extension agents were asked if the support received from extension agent contributed to their knowledge on cattle welfare. Half percent of farmers (50%) confirmed services and advice contribute to their knowledge while 11% stated that they do not contribute to their knowledge of how to maintain and improve their cattle welfare (Table 4.3).

In a study conducted by Katikati and Fourie (2019), similar results were recorded where livestock farmers reported that extension officers facilitate them on how vaccination procedures should be followed based on geographical conditions through

non-formal education. This shows that agricultural agents are providing services and advice to cattle farmers regarding their cattle welfare and their services are contributing positively to farmer's knowledge of cattle farmers.

4.5 Support received by farmers from advisors regarding their cattle welfare

4.5.1 Activities held by extension agents for emerging farmers

Emerging cattle farmers were asked which activities are held by extension agents and results were recorded in Figure 4.17.

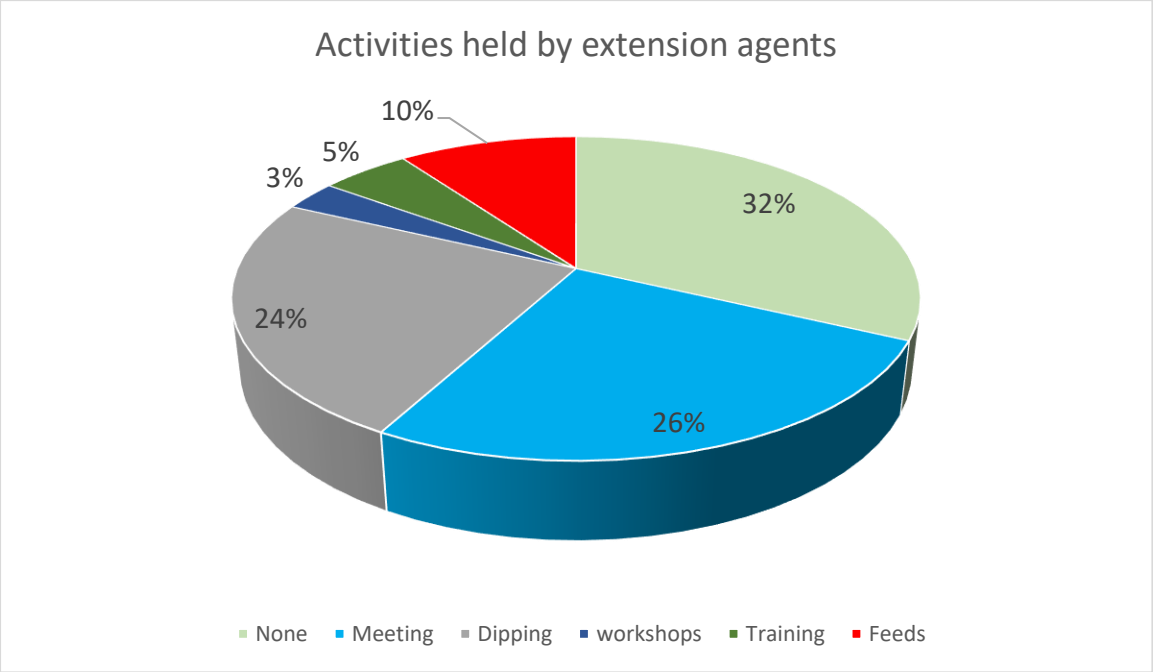

Figure 4.17: Activities held by extension agents for emerging farmers

According to results recorded in Figure 4.17, about 32% of farmers mentioned that extension agents never held any activities with them while 26% stated that extension agents only hold meetings with cattle farmers. Twenty-four percent of cattle farmers stated that they only help them with cattle dipping. Only 10 % mentioned that agricultural advisors only come to give them feeds while 5 % stated that extension agent hold training programme with farmers and lastly 3% mentioned that they come for workshops.

These results can be supported by Mbongeni *et.al.* (2017) study which unveiled that farmers do not receive enough information regarding their livestock welfare and they stated that they only inject for them without informing them about the disease they are protecting their animals against. Less than 15% from Mbongeni *et.al.* (2017) study were found to have been trained on how to prevent diseases and majority of those trained farmers were males.

Mbongeni *et,al.* (2017) further stated that animal technicians vaccinate their livestock against anthrax and black quarter. The most rendered services by the government were found to be vaccination and tick control (Katikati and Fourie, 2019).

4.5.2 Cattle welfare practices implemented by emerging farmers

Emerging cattle farmers were asked to mention cattle welfare practices they implement to maintain their cattle welfare. The findings are presented in Figure 4.18.

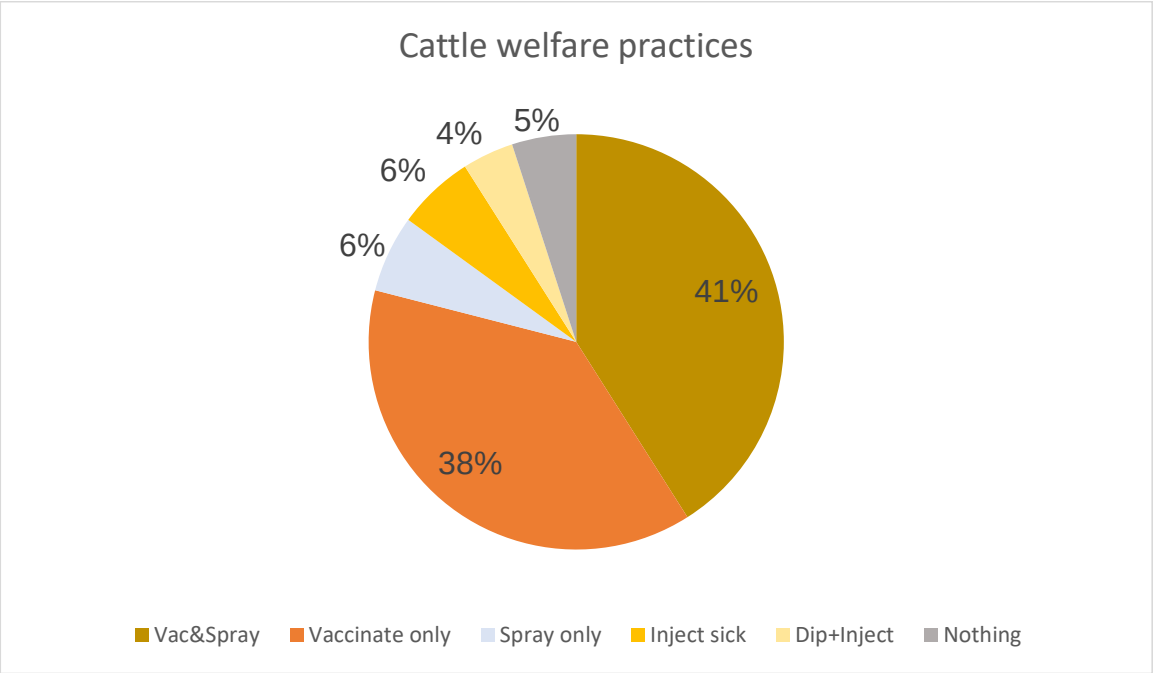

Figure 4.18: Cattle welfare practices implemented by emerging farmers.

The results in Figure 4.18 shows that most of farmers with 41% were found to be injecting for vaccination and spraying for ticks using different methods such as plunge dipping but majority were using hand spray while 38% were found to be vaccinating for diseases and extension agent inform them when it is time to vaccinate. Most of

those farmers (38%) were vaccinating their cattle against heart water, red water and lumpy skin disease.

A shared percentage of 6% stated that they only spray their cattle for ticks, and they do that after discovering that they are attacked by ticks while the other 6% reported that they only inject when their cattle are sick (they do not vaccinate). About 5 % of farmers reported that they do not do anything to improve or to maintain their cattle welfare *"we have never seen a sick animal in our farm and we do not prevent because they have never get sick".*

Four percent of farmers mentioned that they only dip and inject their livestock for disease prevention. Among 6 % of farmers who were found to be injecting their sick animals reported that they only consult after identifying a sick animal and in case they notice a sick animal they call a veterinarian or commercial farmers to inject for them. Referring to Figure 4.18, emerging cattle farmers of Sinthumule-Kutama are following the right procedure when it comes to animal welfare improvements as they are preventing however sometimes the diseases can lead to death due to poor immune system of livestock.

The findings of this study are supported by Katikati and Fourie (2019) study who reported that emerging cattle farmers use different methods to control parasite, however majority of assessed farmers were found to be using pour on, plunge dipping and hand spray. Participants were found to be vaccinating their cattle against diseases as anthrax, red water and black quarter.

4.5.3 Expectations of emerging farmers from extension agent

Emerging cattle farmers were asked to mention the kind of support they expect from agricultural advisors regarding their cattle welfare improvement, these are kind of support that will help them with improving the welfare of their cattle and the results were recorded on Figure 4.19.

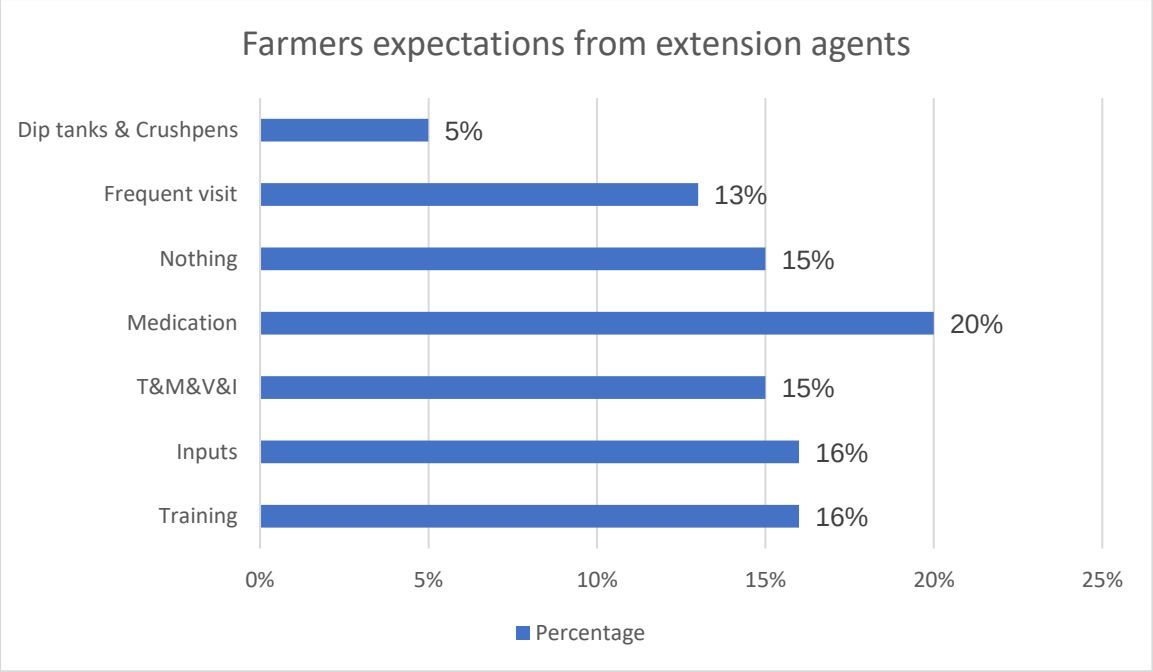

Figure 4.19: Emerging farmer's expectations from agricultural advisor

According to Figure 4.19, most of farmers were found to be expecting medications from agricultural advisors with their percentage been 20% while 16% mentioned that they want inputs (feeds, nutritional supplements). Less than 20% expected training programme from agricultural advisors as they believed that those training could benefit them, they will improve their knowledge on cattle welfare improvement and generally they will improve their cattle production.

About 15% revealed that they need both training, medication provision, frequent visit and input provision. This shows that number of emerging cattle farmers in Sinthumule-Kutama are not satisfied as they need more than two services from agricultural advisors. About 15% expected nothing from agricultural advisors as some believed that extension agents are doing all they expected to do, while other farmers did not want anything as they reported that extension officers do not fulfil their promises and they give inputs those who are their favourite.

Less than 13% expected frequent visit as they believed that through visits, extension agents can help them with advice and knowledge after observing their herds situation and condition" they will be able to see how we are farming and give us important advice if we are failing somewhere". Only 5% expected dip tanks and crush pens, they want extension advisors to assist them with repairing their community infrastructure for them

to have a station (handling facilities) where they will take their animals for cattle welfare practices such as dip and injection.

Among this 5 % there are old people who cannot handle their animals like young farmers who can tie their targeted animal with a rope, this is very important as farmers can identify a sick animal early but do not do anything about it because of scarcity in cattle health handling facilities. Medications are needed in cattle production and majority of assessed farmers disclosed that they do not get them from extension advisors, they only buy and they are much expensive.

4.5.4 Emerging farmers interpretation of extension agents 'role

Emerging cattle farmers were asked to express their feelings about the role of extension agent regarding their cattle welfare. The findings are represented in Figure 4.20.

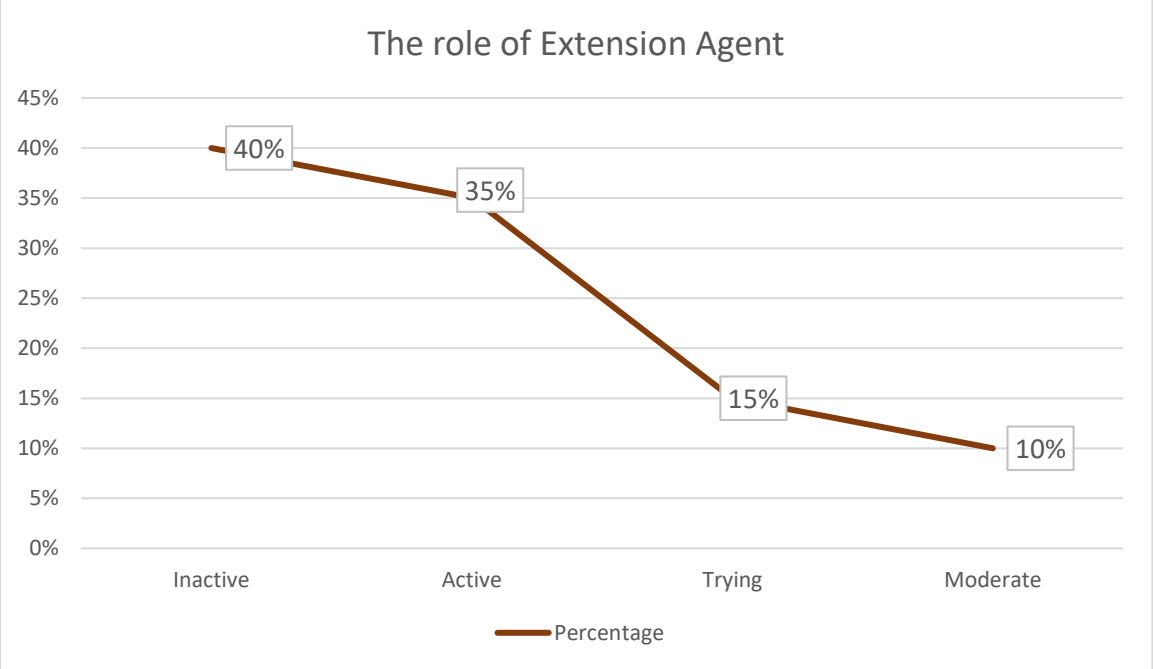

Figure 4.20: Viewpoints of emerging farmers on the role extension agent

The results in Figure 4.20 show that most of farmers (40%) were found to be regarding extension agents as inactive, not playing their role *"They are relaxed and spend most their time at the office instead of coming to us".* Among this 40 %, there are farmers who highlighted that extension advisors are nowhere to be found as they do not take their calls sometimes when they want to enquire or ask for help.

About 35% of assessed farmers felt that extension agents are doing their job as they help them with important information and advice on cattle welfare practices *"They are playing their role because they even spray or dip, inject for us before the beginning of every season and they give us cattle feeds".* Only 15 % mentioned that extension agents are trying to satisfy farmer's needs.

Some of these farmers believed that their extension agents are very busy, and they do not have enough time to cover all livestock *farmers "they come to us when they get time, they seem busy as they promise to come to us sometimes and never showed up, sometimes they just come to deliver only feeds and medications".* Lastly 10 % did not know how they feel about extension agents' role as they opted moderate and these farmers were not sure about the role agricultural advisors. Most of this 10 % reported *as "I cannot say they are playing their role, or they are not playing their role, they are just in between".*

Majority of farmers perceived extension agents as inactive bodies and this might have been caused by poor services farmers are receiving and lack of visits from agricultural advisors. Different results were recorded by Sebeho (2016) who recorded that majority of farmers were satisfied with the role of their extension agents as they regarded them competent (technical and social) in performing extension services and they also perceived the role of extension as essential body in agriculture.

4.5.5 Opinion of emerging farmers on the importance of extension services in farming

Cattle farmers were asked how agricultural extension and advisory services is important in their cattle farming by looking at the services, values and qualities they received from extension officers. The results are reflected in Table 4.4.

Table 4.4: Perception of emerging farmers on the importance agricultural extension and advisory services in farming.

Importance of agricultural extension and advisory services in farming	Percentage (%)
1. For advice	15%
2. For knowledge	20%
3. Source of information	13%

4. Messenger	6%
5. Assist during desperate times	21%
6. Not important	25%

Referring to Table 4.4, it was found that one quarter of farmers believed that extension agents are not important in their farming. About 21% mentioned that extension agents are important as they help them during disparate times (they give them food during drought season and medications when it is time for vaccination) while 20% stated that extension agent give them important knowledge that can be applied to their sick animals and see progress in their health.

Only 15% revealed that extension agent gave them advice on different aspects and it helped them improve their production while 13% mentioned that extension agents are source of information as they even tell them about things they do not know and they provide them with useful information such as forms to apply for vouchers and they also help them complete the forms.

Few numbers of farmers with 6% mentioned that extension agents are messengers between them and the department *"They carry our complains to the department and the department respond to our needs through them".* Most of farmers highlighted that agricultural advisors are not important in farming. These are farmers who mostly mentioned that there is no difference (whether there are extension agents or not, their production improvement does not come from extension agents).

This is not good as some of these farmers might choose not to participate in extension projects and activities influenced by their perception towards extension agents and they will miss more important information/knowledge. Mampane (2019) cited the study conducted by Enki *et.al* (2001) which disclosed that it is important for farmers to have to extension officers as it helps them receive crucial information and advice necessary towards their cattle production.

CHAPTER 5 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study was to assess viewpoints held by emerging cattle farmers regarding the importance of agricultural extension, the role and the impact of extension advisors in improving the welfare of their cattle in Sinthumule-Kutama areas.
This study was intended addressing the following objectives:

i). To describe the socio-economic characteristics of the emerging cattle farmers in Sinthumule-Kutama areas of Makhado local municipality, (ii) To determine the perception of Sinthumule-Kutama emerging cattle farmers on extension and advisory services in improving the welfare of their cattle, (iii) To determine the contribution of extension activities in improving the knowledge of emerging cattle farmers on how to improve their livestock welfare in Sinthumule-Kutama areas of Makhado local municipality and (iv). To find out whether the emerging cattle farmers receive support from the extension advisors regarding their cattle welfare in Sinthumule-Kutama areas of Makhado local municipality.

This chapter covers the following: (5.2) Summary (5.3) Conclusion and (5.4) Recommendations

5.2 Summary

The study found that majority of emerging cattle farmers of Sinthumule-Kutama possessed the positive perception towards agricultural extension and advisory services because they agreed with four statements out of seven statements regarding perception. The perception of these farmers is influenced by their socio-economic characteristics as some of these farmers assumed that extension agents are not useful because they can implement cattle welfare practices on their own without assistance (due to more experience they have). Majority of farmers who stated that extension officers are not important bodies in cattle farming are those who can afford cattle production inputs,skilled ,knowledgeable and with experience.

Majority of farmers perceived extension agents as important bodies in cattle production because they receive services from extension agents regarding their cattle welfare .Farmers who are not receiving services from extension agents are the ones with more negative perception towards agricultural and advisory services because they believe that extension agents are useless and they do not help them with improving their cattle welfare .Although few of those farmers understood their reasons for not receiving extension services (not registered and not qualifying for the services) and then that made them hold a positive perception towards agricultural extension and advisory services regardless of services they are not receiving.

This shows that emerging cattle farmers of Sinthumule-Kutama regard agricultural advisors as important bodies in their cattle welfare improvement as they agreed to the following statements: “Animal welfare is important in cattle farming”, *“Agricultural extension and advisory services are important in cattle farming”, “They are knowledgeable about cattle welfare”* and *“The approaches used by extension agents are effective”.* Farmers are satisfied with the approaches used by extension agents as they mentioned that agents offer them an opportunity to engage and to meet other farmers as they gather during extension meetings(this also influenced their perception towards agricultural extension and advisory services).

Farmers disagreed to three statements which state that: “Their participation on extension activities is good”,“Their accessibility of cattle welfare (CW) information is easy” and “Extension workers visit them frequently”. Majority of farmers regarded extension agents as inactive, not playing their role as they mentioned that they spend most of their time at the office instead of coming to them. It was found that quarter of cattle farmers believed that extension agents are not important in their farming.

Majority of Sinthumule-Kutama cattle farmers are older than 50 years, youth farmers were very few and majority of those farmers were found to be females. Most of emerging cattle farmers of Sinthumule-Kutama mentioned that they are married. The results further indicated that majority of female farmers did not go to school at all while most male farmers were found to be more educated as they have completed tertiary education.

Majority of these emerging cattle farmers are pensioners and most of them rely on social grant. Majority of farmers kept their cattle for beef production as they slaughter their old livestock and sell the meat to their neighbours, however majority of farmers received their income from non-farming activities. Emerging cattle farmers were also found to be using family members as labour in their cattle farming.

The study further revealed that majority of emerging farmers agreed that they have heard about cattle welfare and further indicated that they have heard about cattle welfare from different sources but the information is not sufficient. Majority of farmers reported that they have access to extension agents. Emerging cattle farmers further reported that they receive services and advice from extension agent on their cattle welfare.

Farmers who were found to be not accessing agricultural advisors indicated that they rely on committee members (organised by extension workers) when they face challenges with their cattle welfare. Half percent of farmers confirmed services and advice contribute to their knowledge of cattle welfare. Majority of farmers reported that extension agents never held any activities with them. Referring to statements in section 4.3, opinions of farmers on majority statements (four) revealed that farmers perceived agricultural extension and advisory services as important and needed in cattle welfare improvement. Majority of farmers were found to be injecting for vaccination and spraying for ticks using different methods such as plunge dipping, but most of them are using hand spray. Few farmers reported that they do not do anything to improve or to maintain their cattle welfare.

Farmers indicated that agricultural practitioners help them by injecting for them (vaccination) and they also contribute to their cattle welfare knowledge through training, they also facilitate them on cattle diseases and practices to be implemented to improve their cattle welfare. Majority of farmers were found to be expecting medications from agricultural advisors and only few expected dip tanks and crush pens, they want extension advisors to assist them with repairing their community infrastructure for them to have a station (handling facilities).

Farmer's perception towards extension and advisory services is contributed by their socio-economic characteristics and the support they are receiving from extension agents. The poor the support, the negative the perception farmers hold and the

younger the farmer, the positive the perception towards extension and advisory services.

5.3 Conclusion

Majority of emerging cattle farmers who agreed with many statements were found to be farmers who are under the age of 50, majority of these farmers are educated and they have knowledge about cattle welfare. Majority of these farmers are independent when it comes to their cattle welfare practices and they can access extension workers anytime as some indicated that they communicate with their advisors even on social media such as WhatsApp.

Majority of emerging cattle farmers in Sinthumule-Kutama perceive agricultural extension and advisory services as important bodies in their cattle welfare improvement. This perception about the importance of agricultural extension and advisory services is based on the farmers' agreement with four statements regarding their cattle welfare (statements in section 4.3). Majority farmers highlighted that extension agents are important as they help them during disparate times because they give them cattle feeds during drought season and medications when it is time for vaccination.

Farmer’s opinions on extension advisors were good, they mentioned positive things about agricultural advisors helping them improve their cattle welfare. Emerging cattle farmers regarded extension agents as active workers because they deliver the services that help with their cattle welfare improvement such as injecting and spraying for parasites. Furthermore, farmers perceived cattle welfare as important in their farming because majority of them were found to be using both scientific and traditional medications to treat and prevent their cattle from diseases.

Majority of farmers are receiving services and advice from extension workers on their cattle welfare and they further stated that the extension activities contribute to their knowledge of cattle welfare. Farmers further indicated that agricultural officers teach them about the symptoms of a sick animal, how to identify and diagnose a sick animal, advise them on how to prevent expected/upcoming diseases and this contribute to their knowledge of cattle welfare.

Extension workers were found to be supporting emerging cattle farmers to improve their cattle welfare because they inject for farmers when season changes but they only inject in areas where there are handling facilities such as crush pens. Farmers who reported that they do not inject for them are from the same place. This is because there is no proper infrastructure such as crush pens and it becomes hard for agricultural workers to help farmers with management practices.

In areas without community animal crush pens, committee members are given vaccination medications to distribute to other farmers for them to inject themselves. Extension workers support emerging cattle farmers to improve the welfare of their cattle by minimising external parasite through dipping. Results further indicated that extension agents only hold meetings with emerging cattle farmers during community visits.

From the findings of the study, it can be concluded that majority of cattle farmers are not knowledgeable about cattle welfare and its practices as they rely on other bodies for help and this can affect their production. This might be the case more especially if they do not get help in time, it can lead to death (high mortality rate). However majority of farmers believe that their knowledge on cattle welfare is average as they rely on other farmers for cattle welfare practices.

Farmer's perception might have been influenced by poor visit, services and advice they are receiving from extension agents. According to emerging cattle farmers of Sinthumule-Kutama, agricultural extension and advisory services in cattle welfare are not good as expected because their services and activities that can assist farmers are limited. Extension services do not favour old farmers as extension workers do not give one-on-one visit, this makes it difficult for other farmers to attend meetings held by advisors because they do not know when extension workers are coming and they miss important meetings.

Although extension workers are visiting the areas but they visit after some time (mostly after 3 months). The perception of cattle farmers towards extension and advisory services is good as they agreed with many statements regarding extension services

helping them improve their cattle welfare. The perception of farmers is influenced by the support they are receiving from extension workers regarding cattle welfare.

Emerging cattle farmers are benefiting from agricultural and extension services as they indicated that the activities held by extension workers contribute to their knowledge of cattle welfare. Agricultural extension and advisory services are helping farmers improve their cattle welfare and it can be concluded that extension workers are important bodies in cattle farming.

Extension workers have some of these farmers as leaders within the community to manage cattle welfare when extension worker is not around and it helps famers help themselves as those who cannot implement cattle welfare practices can be assisted when they face challenges without waiting for their agricultural advisors.

5.4 Recommendations

The study will advise and pass recommendations to four bodies referring to its findings. These bodies are (5.4.1) emerging cattle farmers, (5.4.2) researchers, (5.4.3) agricultural advisors and (5.4.4) government (DALRD).

5.4.1 To emerging cattle farmers

Farmers must take part in extension programmes and/or visit other livestock farmers who are good with cattle welfare practices to learn how to implement cattle welfare practices and this will help them gain more skills. All farmers must know where the office of agricultural extension and advisory services is for them to visit agricultural advisors if they come across challenges regarding their cattle welfare and have their phone numbers to call in time of need. This will also improve their cattle welfare knowledge because only farmer's representatives have phone numbers of their extension workers.

Farmers indicated that medications are expensive and sometimes they do not receive them in time from government, they can form groups with the help of an extension officer to get access to veterinary services from the government or get access to loan which will help them pay their private veterinarian or buy medication as a group before every season (vaccination) and those who are skilled can inject for all farmers.

Those farmers who are literate can register for animal health short courses offered by high education instituations as agricultural colleges or ARC ask for documents with cattle welfare information from agricultural advisors and they can teach those who are illiterate. This will help them increase the knowledge of emerging cattle farmers on cattle welfare. Farmers can also ask agricultural advisor about their role and their reasons for not visiting them frequently, it will make them understand how their agricultural advisor work and it can also change their perception towards agricultural extension services.

5.4.2 To researchers

Researchers must also conduct a study on reasons for agricultural advisors for not frequently visiting emerging cattle farmers in Sinthumule-Kutama areas as this study

focused only on the perception of farmers but it did not engage extension workers. Farmer's perception can be compared with agricultural advisor's reasons to build a different comparative conclusion.

Researchers should also conduct experimental research in collaboration with extension agent on how to improve services and cattle welfare practices of emerging cattle farmer. This experimental research must focus on technical training of emerging livestock farmers where farmers will be trained how to implement animal welfare practices and after the training, they demonstrate what extension workers taught and showed them. Researcher can conduct this research in communities with crush pens and all sampled farmers can gather there for observation.

This study believes that if researchers do that, farmers will be able to manage their cattle because most farmers are relying on other farmers because they lack knowledge and skills. Researchers can collaborate with extension and advisory workers to secure finding for the study.. This study will help cattle farmers to improve their skills, knowledge of cattle welfare and they will also be experienced through training that will be conducted as part of the study. Researchers should conduct a study to access cattle welfare knowledge of farmers to see if they hold important knowledge that can contribute positively to their cattle production.

5.4.3 To extension agents

Agricultural advisors can be advised to visit farmers frequently and to give them one on one visit. Most farmers rely on other farmers for cattle welfare practices such as injection, training, camp, field days and exhibition programmes can be organised to teach farmers about cattle welfare (symptoms of different diseases and practices). Extension officers can be advised to arrange a veterinarian or animal practitioner who will demonstrate cattle welfare practices considering that some farmers have heard about the recommended cattle welfare practices but they do not know how to implement them.

This will help farmers to be independent and it will reduce mortality rate as they will implement a suitable welfare practice after identifying and diagnosing a sick animal. Farmers of Sinthumule-Kutama must be given medication individually because some

mentioned that committee members who are organised by extension workers to receive inputs on behalf of farmers from DALRRLD do not pass those inputs to farmers.

Agricultural advisors are encouraged to assist emerging farmers who are unregistered to be registered with the government as some of them are facing financial challenges and they cannot afford cattle production inputs. Agricultural advisors can help farmers form groups (organization, association), it will assist farmers to work together and learn from each other regarding their cattle welfare practices.

Agricultural advisors can form farmers groups that can be train weekly and this can change the situation as farmers will be having access to extension workers and they will be able to share with them challenges they are facing with their cattle welfare. Farmers access to agricultural workers through training can change their perception towards extension workers as it will enable farmers to receive services and advise about their cattle welfare from extension workers.

5.4.4 To the Department of Agriculture, Land and Rural Development (DALRRD)

Famers were complaining about the poor visits they get from extension agents and lack of infrastructure (cattle welfare handling facilities). Most farmers wished for individual visit from extension agents and animal technicians. According to Davis *et al*.(2019) the ratio of extension agent to farmers is 1: 5000 and this is one of the reason for poor visit of extension officers to farmers (lack of staffing)..Department of Agriculture, Land and Rural Development can also be encouraged to increase the budget for cattle farmers.

Increasing budget for cattle farmers will help farmers get the handling facilities that will enable cattle welfare practices to be easily implemented. Increased budget includes buying inputs such as medication for emerging cattle farmers because most farmers indicated that they cannot afford.

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