



THE CONTRIBUTION OF CATTLE PRODUCTION TO HOUSEHOLD FOOD SECURITY: THE CASE OF HURUNGWE DISTRICT

BY

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Acronyms

CSI	Coping Strategy Index
DDF	District Development Fund
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
HH	Household
SSA	Sub-Saharan Africa

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Abstract

This study focuses on the contribution of cattle production and its implications on household food security in Hurungwe district. The study took a descriptive study design where the researcher utilized a pragmatic research approach. Semi structured interviews were utilised to interview participants and key informants from district's stakeholders. A total of twenty-four households were interviewed and five key informants were also interviewed. Dip tanks from which respondents were selected were purposively sampled. The researcher also gathered data through document review and observations.

The study assessed cattle production pattern in the district and the resultant effect on household food security. The study also assessed household's breeding, restocking and coping strategies, as well as land utilisation and reasons for stocking cattle.

Findings showed a declining communal herd with households owning mostly indigenous breeds and an average of seven heads per household. The land holding per household averaged at 0.5 hectares and the cattle herd composition of 55% cows, 28% heifers, 16% calves; with a notable, albeit worrisome finding that only 1% were bulls. This was noted as have negative implications on cattle production levels. 46% of the households were food insecure, and they all agreed that cattle were a source of food and livelihood through meat, milk, draught power and proceeds from sales. It also found out that 42% have reduced their number of meals; 33% have disposed of their assets and these include cattle so that they may have money to buy food. 46% have shifted to tobacco farming altogether.

The study recommended a structured cattle breeding programme to encourage better breeds and increased restocking levels as well as by-laws to limit desertification through increased land and water pressure. Excavation of a dam to support increased cattle herds, deployment of more agricultural extension officers as well as regulation of the market system to incentivise cattle keepers through better prices for their cattle as well as through increased and improved market linkages.

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CHAPTER ONE

Introduction and Background of the study

1.0 Introduction

This chapter introduces us to the cattle production modalities in Sub-Saharan Africa and in Zimbabwe and how cattle production impacts on food security in the Mashonaland West district of Hurungwe. It gives us a background to the study and problem statement as well as outlines the objectives of the study and its justifications.

1.1 Study background

The global agricultural sector makes a 33% contribution to household incomes, with cattle alone accounting for 40% of worldwide income (FAO, 2013). Demands for meat and milk are growing because of population increases, economic growth, and consumer preference. The projected demand for meat alone is expected to increase from 6 to 23 kilograms per person worldwide by 2050 (Scoones, 2007). This draws attention to the potential benefits that can be gained from increasing cattle production. Cattle provides income generation, employment creation, and improved food and nutrition security across different production systems and along different value chains (FAO, 2007).

Cattle production thus enables small holder farmers to have resilient livelihoods against food insecurity and poverty alleviation across the world. According to the Food and Agriculture Organization (FAO); 2013, one half of the world's population live in the rural areas in developing countries and more than half of these depend on produce by small holder farmers. This is more so for Sub-Saharan Africa where most of Africa's agro-ecological regions are predominantly agro-pastoral systems, with the smallholder rural resource-poor farmers heavily dependent on subsistence mixed-annual cropping and cattle production for their livelihoods, including draught power, manure, milk, and meat.

Cattle are important assets in Africa, helping improve the nutritional status of their owners, and contributing to economic growth (Assan, 2014). The case is more so in Zimbabwe, and Hurungwe in particular; where cattle are a dominant agricultural output and are generally considered a key asset for most rural livelihoods and food security (Assan, 2014).

However, cattle production faces increasing constraints at both physical and institutional levels. In the former category, constraints to adopting draught power for livelihood and economic purposes include insufficient numbers at the individual household and communal

level. Assan (2014), posits that, lack of adequate pasture is probably the most important constraint. He adds that diseases are also notable constraints to improving cattle production, particularly those categorized as Group I and Group II. Group I diseases are highly contagious and includes rinderpest, for example. Group II diseases are vector-borne parasitic and viral diseases which may include trypanosomiasis.

Institutional constraints to cattle production include lack of research and market distortions. According to Muzzo (2018), to overcome the problem of low cattle production at the macroeconomic level; governments must continue or start policies aimed at liberalizing markets and revaluing exchange rates. He further argues that research institutions need an increase in funding so that they look into increasing cattle productivity.

Research priorities include breeding on specific aspects, such as increased milk production Muzzo (2018). However, it must be realized that breeding programs have an inherent problem in disseminating improved breeds in a rapid and equitable manner. Quality of pasture may be improved by further research on more accurately calculating stocking rates and on developing mechanisms to control numbers on pastures, for example, community controlled grazing schemes (Tavirimirwa *et al.*, 2013).

According to Tavirimirwa *et al.* (2013), communal cattle production is a sustainable way to improve the livelihoods of the rural population in Zimbabwe. They however posits that there is little information and research conducted to characterize, understand and develop the communal cattle production systems in Zimbabwe.

Communal cattle production in Zimbabwe is extensive and dominated by indigenous cattle which are adaptable to the local environment. The mainly indigenous cattle are adapted to the harsh environmental conditions, but have been considered to be inferior to exotic breeds in terms of carcass quality and yield (Mapiye *et al.*, 2009). Muchenje *et al.* (2008) concluded that indigenous cattle are less susceptible to ticks while Marufu *et al.* (2010) found that the same are less susceptible to tick borne diseases with no significant difference in meat quality.

As noted earlier, Tavirimirwa *et al.* (2013), supports the view that the important functions of cattle, which include provision of food security and socio-cultural role are constrained by high disease and parasite prevalence, low level of management, limited dry season forage availability and poor marketing management. They further argue that any improvement in these constraints may lead to a sustainable increase in communal cattle production.

Other research priorities include new technologies to improve animal health, funding of micro-enterprises to add value to cattle products, and market information systems for small-scale farmers. Schemes to increase cattle production in Zimbabwe will also work if innovations closely match the local sets of circumstances (Assan, 2014). Given the multiple roles of cattle, nutrition and food security in particular; research into innovations that local communities will readily adopt to overcome the problem of low cattle production is needed.

1.2 Problem statement

Cattle production contributes significantly to household food security in developing economies. However this can be adversely affected by low cattle production or not having cattle or other livestock to cushion against economic shocks. This is more so for small holder farmers in Mashonaland West, particularly in Hurungwe. While cattle production provides an entry point for promoting food security at the household level, the contribution of cattle production to household welfare may be becoming insignificant over the years due to various issues. In as much as most Hurungwe communities keep and rear cattle for consumption, income generation, store of wealth and for draught-power, cattle herds continue to dwindle. This study sought to determine how cattle production contributes to food security and how the low cattle production in Hurungwe district has impacted on household food security. Findings from this study will be useful in future policy formulation and formulating strategies on how cattle production can be incorporated into the farming mix in the light of poor crop yields and climate change.

1.3 Research Objectives

1.3.1. Main Objective

To assess the contribution of cattle production on food security in Hurungwe district.

1.3.2 Specific Objectives

1 To assess how the cattle production pattern affects food availability for the small scale farmers in Hurungwe district.

2 To determine how cattle production directly or indirectly impacts on access to food and nutrition for the small scale farmer households.

To determine the relationship (if any) between the cattle productivity and the stability of food supply for the small scale farmers of Hurungwe district.

1.4 Research Questions

1. Is there a relationship between cattle production and food security in Hurungwe?
2. What are the cattle production trends in Hurungwe?
3. What are the effects of low cattle production on household food security in Hurungwe?
4. What are the strategies that can be implemented to improve food security through cattle production in Hurungwe?

1.5 Justification

The study derives significance from the fact that there is apparent continued poor performance of the agricultural sector particularly in crop production, improved cattle production would therefore cushion the communities against food insecurity shocks. This is only possible through research on the possible interventions to ensure an adaptable indigenous cattle species to mitigate effects of diseases and pests. Research will also inform on policy and other interventions to ensure optimum communal herds and land use as well as food and nutrition secure communities of Zimbabwe.

Understanding current cattle production modalities provide updated information on constrains faced by farmers and also provide indications of possible solutions to those constrains.

Carrying out this study also shed light on prevailing disparities in disadvantaged persons or groups which are a priority in developing sector-based initiatives in food security strategies essential for sustainable development, hence informed insights into how policy can be made

more inclusive and supportive of such groups who have the capacity to transform and increase food output for the country.

This research provided evidence that can be leveraged on when building knowledge and advocacy efforts for sustainable agriculture and other knowledge domains. It also helped the researcher to bridge the gap between theory and practice by assuming a central and practical role in the enquiry on cattle production and food security.

1.6 Chapter summary

The chapter provided a background on cattle production from a global perspective, and its importance to food security and economic contribution, to the particular; where Hurungwe, a district in Mashonaland West Province of Zimbabwe was the case in point. The constraints in cattle production as suggested by other scholars were stated as well as the problem statement which necessitated this enquiry. Study objectives and research questions were outlined in this chapter as well as the justification for carrying out this study.

Chapter Two

Literature Review

2.1 Introduction

This chapter looks at literature related to cattle production and factors affecting cattle production in Zimbabwe and elsewhere. The chapter also touches on the importance and contribution of cattle to human livelihoods particularly in rural settings.

2.2 Importance of cattle

In Zimbabwe, cattle are the most important livestock species followed by goats. This is the trend in most countries in Southern Africa. The cattle population varies by agro-ecological regions. Approximately 89% of the cattle in Zimbabwe are in the smallholder sector and about 25% of GDP comes from livestock sector. Studies conducted by Masikati (year) concluded that more resources should be channelled to communal cattle development programmes in order to redress national food insecurity as communal cattle fulfil multiple roles that include milk, meat manure and draught power (Masikati, 2010)

Similar findings were cited in a study by Bradford (Year) who cited that livestock contribute indirectly to food security by increasing crop output through providing manure, which is a valuable source of organic plant nutrients and reduces the need for chemical fertilizers. Livestock enhance the flexibility and thus the stability of food production. Because they can be kept for variable lengths of time and be maintained on a variety of diets they serve as a buffer to mitigate the impact of fluctuations in crop production on the availability of food for human consumption. (Bradford, 1999)

A survey by Ndebele *et al.* (2007) in Matabeleland revealed that cattle are used as investments and a status symbol. Cattle, thus, generate income among communal households through sales of the animals and their products. Improvement in cattle production and innovative value addition of cattle can create employment for people as individuals are hired to process and sell cattle and their products at various points of the production chain. In the Zimbabwean context, cattle play a pivotal role in socio-cultural function such as *lobola* payments and appeasement of ancestors. However, the actual contribution of cattle at household level is not well known because the current valuation systems rely on monetary standards which ignore the nonmonetary contribution of cattle to households such as

provision of manure, drought power and milk (Chimonyo *et al.*, 2000). More studies need to be conducted to get more information on the real contribution of livestock to human food security and livelihoods. It is therefore imperative for agro-economists to come up with indexes which incorporate non monetary contributions when valuing cattle's contribution to communal livelihoods (Tavirimirwa, 2012).

2.3 Factors attributable to low cattle production levels

Mwangi (2013) added that socio-economic and environmental factors such as population growth, urbanization and economic development, changing livestock market demands, impacts of climate variability and science and technology trends contributed to the changes in livestock numbers. According to Ilea (2009), global livestock production is expected to double by 2050, growing faster than any other agricultural sub-sector. Livestock farming has great potential to alleviate household food insecurity and poverty especially in the communal areas of the world, including South Africa (Musemwa *et al.*, 2008). According to Smith *et al.* (2013), livestock production is an indispensable part of the solution to global food security, and a reasonable amount of the world's food supply comes from systems of which livestock are an important part. Considering the importance of livestock systems for food security, and their potential to impact on poverty, livelihood, health and nutrition as well as the environment, the livestock sector still receives limited attention in the global agriculture and food debate.

One of the contributing factors to low livestock production may be hinged on the livestock management systems. Livestock management systems and production in communal farming systems differ significantly commercial systems. Herding of cattle is the most common method of cattle rearing in communal farming in Zimbabwe. Cattle are herded during the day and penned at night. In cases where there is limited grazing land, all the cattle from the entire village may be considered as a single interbreeding herd with no attempts of controlling mating. Herds from different households of the same village, however, may graze separately where there are vast tracts of grazing land. Following crop harvesting, cattle herds are let loose to feed on crop residues until the beginning of the rainy season, when the cattle have to be herded. The low intake of poor quality feed often limits production (Mapiye *et al.*, 2006). Communal cattle are rarely supplemented with commercial feeds or improved legume fodder resulting in low intake of poor quality feed, which often limits livestock productivity. Since feeding is restricted, cattle have little choice of feed, resulting in poor body condition and low weight gains and a higher predisposition of the animals to endo-parasites during the dry

season. Animals move much further away from the homesteads during exceptionally dry seasons depending on spatial distribution of forage patches and availability of water and this has a bearing on productivity (Mapiye , 2006).

Another factor which has a bearing on livestock productivity is breeding control. Lack of controlled breeding in communal areas has caused inbreeding, which result in poor growth rates (Mashoko *et al.*, 2007) in cattle. There are no structured breeding systems and appropriate infrastructure such as paddocks and, therefore, cows and bulls of unknown genetic merit and bloodlines randomly mate thereby increasing chances of inferior offspring. The low management level in communal cattle production systems result in poor reproductive performance.

The low management level result in high mortality among calves and slow growth rates among those that survive are major constraints to cattle production in communal areas. In addition, in most communities bulls constitute less than 1% of the herd resulting in low conception rate. Low bulling ratio is one of the major causes of economic loss to cattle farmers as most farmers do not own bulls (Mashoko *et al.*, 2007).

Diseases and parasites are major constraints to communal cattle production and are endemic in most Zimbabwe communal areas. The impact of endo-parasites is mainly high mortalities, dry season weight loss which reduce fertility through nutrition induced stress. Poor control of diseases and limited feeding options have negative financial and productivity implications as 70% of calves are born during the dry season (Ngongoni *et al.*, 2006). Studies by Homann and van Rooyen (2007) cited communal herd mortality rate as high as 18%. The most common diseases reported by farmers are blackleg, heart-water, babesiosis, anthrax and anaplasmosis (Masikati, 2010; Mavedzenge *et al.*, 2006). The situation is worsened by the unavailability and high cost of drugs (Ndebele *et al.*, 2007) and inadequate veterinary officials at community level. For example, a survey by Mashoko *et al.* (2006) has shown that most of the cattle farmers have poor access to veterinary extension services except for contact with the dip attendants during dipping days. Cattle are also susceptible to external parasites causing heart water and massive economic loss to the livestock farmers.

In low-income agrarian economies, livestock form an integral part of predominantly smallholder diversified crop-livestock farming systems. Superseded only by larger-scale staple crops, the livestock sector is the second most important contributor to the agricultural economy. Despite its smaller output compared with that of staple crops, productivity and

income growth in the livestock sector have strong income multiplier and poverty reduction impacts. This results from the demand side via direct and indirect income gains among rural households benefiting from income improvements, and from the supply side via linkages (Otte, 2012).

Livestock sector development requires that sound macroeconomic policies and a generally conducive institutional framework be in place. For instance, a low inflation rate, stable fiscal policies, a functional judicial system and limited corruption are critical for livestock keepers (and entrepreneurs in general) through providing incentives for planning and making long-term investments in production capacity. However, sound macroeconomic policies and broadly functional institutions are not sufficient to sustain inclusive growth of the livestock sector; owing to limited and asymmetric information and high transaction costs, market imperfections loom large in rural areas and prevent livestock keepers, particularly the asset-poor, from tapping into the opportunities offered by a conducive macroeconomic and institutional environment (Serra and Stiglitz, 2008).

Smallholder livestock systems play a very important role in supporting rural livelihoods. In smallholder systems, livestock fulfil many functions in addition to producing meat, milk and eggs. Functions include provision of fertilizer, fuel, draught power and transport; a means of savings and investment; a buffer against crop failure; and diverse cultural and religious roles (FAO, 2009). In sub-Saharan Africa and South Asia, smallholder livestock farmers contribute more than 80 percent of the global livestock production, using foods that are not palatable to humans (i.e. grass, fodder and waste) for their livestock production (Smith *et al.*, 2013). Therefore, this study aimed at investigating the socio-economic factors that affected livestock numbers. The overall intention of the study is to examine how smallholder livestock farmers in the Free State can reduce their vulnerability to factors affecting the livestock farming.

Livestock production in the developing world occurs in a wide range of heterogeneous production systems. These can range from pastoral/grassland-based systems, which occupy most of the land area and have low human population densities, through mixed crop-livestock systems, usually in areas suitable both for arable and livestock production and where the bulk of rural human population lives, and intensive systems usually in peri-urban/urban areas. Landless systems are also often found in urban areas. All these systems in developing countries produce about 50% of the beef, 41% of the milk, 72% of the lamb, 59% of the pork and 53% of the poultry, globally (Herrero *et al.*, 2009).

Livestock are often one of the main assets that rural households possess. Access to, control over and ownership of assets are critical aspects of well-being (Carter and Barrett, 2006).

Men and women often manage different types of animals and are responsible for different aspects of animal care. Women and men also typically have different objectives for keeping animals, different authorities and responsibilities regarding animal management, and different abilities to access and use new information and improved technologies. Although there is great variability across systems and socioeconomic contexts, women generally play a major role in managing and caring for animals, even when they are not the owners (Flint an, 2008)

In Nigeria, Ayoade *et al.* (2009) report that women feed and manage vulnerable animals (calves, small ruminants and sick, injured and pregnant animals), clean barns, milk cows and make butter and cheese, but are not involved in livestock marketing or managing livestock diseases. Similarly in Ethiopia, women clean cowsheds, milk cows, look after calves and sick animals, cut the grass and supervise the feeding and grazing of cows, make dung cakes and butter (Carter and Barrett, 2006).

According to Kassam *et al.* (2009), the main constraint to increasing livestock productivity and output is the lack of adequate supplies of good quality livestock feed in the dry season produced at a competitive cost and without jeopardizing household food security. Similar finding were made by Masikati (Year) who cited that together with high incidences of diseases and mortality rates, feed shortages lead to low livestock productivity (Masikati, 2010).

Studies carried out in the 1980s demonstrated how valuable cattle are to communal area people, with the total economic value (estimated in replacement cost terms) far exceeding those derived from single-use beef animals (Barrett, 1992; Scoones, 1992). Average maize yields per hectare, for example, correlate positively with size of livestock herd and consequent manure use (Rukuni, 1994). Comparing returns (by area and by individual animal) to communal area livestock production systems and commercial production (as beef, wildlife and combinations) at prevailing stocking rates showed how productive communal systems were, if the full range of economic value was accounted for. These studies demonstrated yet again that, given existing circumstances of limited land availability, small

herd sizes and a multiple use system, where livestock production was intimately bound up with crop production, not gearing towards marketing (let alone export sales) was a perfectly rational position, despite all the policy and extension messages urging farmers to sell more (Scoones , 2001).

Livestock are central to the livelihoods of the poor. They form an integral part of mixed farming systems, where they help raise whole-farm productivity and provide a steady stream of food and revenues for households. However, livestock's role and contribution to livelihoods in developing countries extends well beyond what is produced for the market or for direct consumption. Livestock play many other important roles, including: as a provider of employment to the farmer and family members (Sansoucy, 1995).

There are a variety of socio-economic and institutional constraints facing livestock development in Africa. They include the low level and rate of investment in the livestock sector (including investment in fixed assets, infrastructure and research) and inadequate funding of the non-salary portion of recurrent expenditure for services including research. Inappropriate pricing, marketing, land tenure and other policies related to livestock affect producer incentives and the willingness of potential investors to participate in the sector's development. Administrative and organizational inefficiency in the purchase and distribution of production inputs and the extension of credit exacerbate the problems. In situations where qualified staff is in short supply, the problems impeding the sector's development seem particularly serious (Addis, 1998)

In sub-Saharan Africa, technical constraints remain a major impediment to seeking and/or implementing technical solutions to livestock production problems. The main constraints can be grouped in the following broad categories: animal feed and nutrition; genetic factors; animal health and disease problems; and inadequate management practices. Past efforts to identify and eliminate constraints have emphasised the animal health and disease aspect. It is logical that disease control be dealt with to prevent or control losses before turning to the more productivity-orientated problems of health management. Concern has, however, been expressed that in Africa this "preservationist" approach may have been over emphasized at the expense of "husbandry" constraints. Management constraints relating both to technical problems (e.g. health, nutrition) and resource utilization may have been unduly neglected.

Livestock contributes to food security in several ways, namely:

- (i) Contributing to direct access to animal source foods;
- (ii) Providing cash income from sale of livestock and livestock products, which can in turn be used to purchase food especially during times of food deficit;
- (iii) Livestock ownership can contribute to increasing aggregate cereal supply as a result of improved productivity from use of manure and traction; and
- (iv) Increasing livestock production can lead to lower prices of livestock products and, therefore, increased access to such products by the poor, especially poor urban consumers.

Given women's traditional responsibility for household food security, their level of control over decisions about whether to sell or consume the family's animal products, as well as over how to use any income obtained from the sale of animal foods, could greatly determine the nutritional well-being of household members. Consumption of even small amounts of animal source foods has been shown to contribute substantially to ensuring dietary adequacy and preventing under nutrition and nutritional deficiencies. Extensive longitudinal studies in Egypt, Kenya and Mexico (Neumann *et al.*, 2003) have shown strong associations between intake of animal source foods and better growth, cognitive function and physical activity of children, better pregnancy outcomes and reduced morbidity from illness. Consumption of adequate amounts of micronutrients, such as those that can be found in animal source foods, is associated with more competent immune systems and better immune responses (Neumann *et al.*, 2003)

The low productivity of the livestock sector is one of the major reasons why only small amounts of food of animal origin are available for human consumption in sub-Saharan Africa. While sub-Saharan Africa as a whole accounts for approximately 14 percent of the world's livestock resources, it produces only about 2.8 percent of the world's meat and milk. In order just to keep pace with human population growth, and so avoid declining self-sufficiency ratios and rising import bills, the output of livestock products in sub-Saharan Africa would have to increase by at least 2.6 percent per annum over the next decade. While expansion of the livestock population can contribute to the necessary increase in output, increases in animal productivity are also necessary. In sub-Saharan Africa as elsewhere, livestock are kept in different production systems, which face varying constraints, possess different potentials for growth and have different resource endowments. Differentiation by

production or farming system is a powerful tool for communicating conclusions to policy makers (Dixon *et al*, 2001)

Increasing human population reduces grazing land in favour of crop production, unclear and disorganized grazing rights and regimes contribute to poor livestock condition and degradation of land. Periodic droughts have been a constant setback to the sustained development of the beef industry and had a negative effect on the conception and calving rates in the past 10 years, with national fertility levels estimated at below 50%. This is primarily due to poor condition of animals as a result of continued degradation of the communal grazing lands and poor management practices. (Revised Livestock Policy, Ministry of Agriculture, August 2007)

2.4 Factors limiting animal production efficiency

The main factors limiting animal production efficiency include the following:

1. Inadequate feed resources in the smallholder sector due to limited grazing land. Secondly, the low crop yields result in little or no surplus food for non-ruminant livestock.
2. The effects of the frequent droughts and the limited development of water resources for livestock especially in the smallholder communal areas.
3. Insufficient numbers of animals of the improved indigenous breeds. Consequently, restocking programs following droughts have had to rely on the use of the less appropriate exotic breeds.
4. Lack of a clear and consolidated policy on the farm.
5. The national systems of grading carcasses of cattle, pigs and small ruminants penalize the indigenous breeds.
6. Lack of formal markets for small ruminants and poultry. While beef producers can market their animals through the private and public abattoirs, or on the hoof through public auctions, such facilities are generally not available for small ruminants and poultry producers. Consequently, many smallholder producers rely on the informal marketing channels. This discourages production.
7. Lack of funding for herd health programs and for provision of general animal health extension services for the newly resettled farmers. Consequently,

disease control and prevention through planned and scheduled activities, such as vaccinations, dipping, de-worming and record-keeping, have been limited.

8. Frequent outbreaks of diseases, especially Foot and Mouth Disease (FMD) and Newcastle disease, disrupt production, marketing and trade.

9. Access to capital is a major limiting factor, especially in view of the current high interest rates and the long-term nature of investments in breeding stock.

(Zimbabwe Country Report, Year). There are no figures on the indices used to show the contribution of cattle in other countries or districts done by other researchers.

Chapter Three

Research Methods

3.1 Introduction

This section outlines the research methodology used in the study. The research approaches as well as the data collection methods used are outlined. Primary data was collected from the field through questionnaires and interviews. Secondary data was also used and was obtained from reports by organisations and officials in the agricultural sector in Hurungwe district. The target population and how sampling was conducted is also discussed in this section and ethical considerations for data collection are also outlined.

3.2 Research Methodology

A systematic approach to the problem helped the researcher arrive at a conclusion. According to Holloway (2003), if researches are not systematically done, chances of finding a conclusion will be limited. Thus the research methodology outlined below provided the researcher with a way to answer the research questions through a framework of theories and principles on which methods and procedures were based.

3.2.1 Research Approach

A research approach is a strategy and technique that entails the procedures of comprehensive assumptions to a detailed process of collecting data, its analysis and interpretation. Consequently, it is centred on the type of the research problem to be addressed. There are three different types of research approaches according to Creswell (2013), which are qualitative, quantitative and mixed methods (pragmatic).

The study utilized a pragmatic research approach which involved using mixed methods that were best suited to the research objectives and questions outlined. This approach was chosen because it helped to overcome the limitation of each single method. Also, the limited project time was another factor considered and as Yin (2003) noted; a combination of research methods improves the quality of research.

3.2.2 Research Design

A descriptive research design was conducted. The design guided the investigator in data collection, analysis and interpretation (Kumar, 2009). This helped to get solutions to the

descriptive research questions as well as to provide a plan of procedures and conditions used in a manner that was both reliable and economic in terms of time and cost (Kothari, 2006).

3.3 Study Population

Study population in the context of this study refers to the set of all objects that possess some common set of characteristics with respect to some research problem. In this study, the study population included all the small holder farmer in ward 14, Hurungwe district. Information was also collected from key informants who were mainly agricultural extension workers and other stakeholders actively involved in cattle production in Hurungwe district.

3.4 Sampling methods

For the purposes of estimating the representativeness of the cases being evaluated; and for increasing the degree of confidence in any inferences to be drawn from this study, sampling methods were used (Silverman, 2008). Various sampling methods can be used to identify study participants. For this study, non-probability (judgmental) sampling methods were used. These methods enabled the researcher to use own personal judgment as to who should be included in the sample frame.

3.4.1 Purposive sampling

Purposive sampling was used to recruit participants into the study. Purposive sampling, also known as judgmental, selective, or subjective sampling, is a type of non-probability sampling technique. Using the approach, participants were selected based on personal judgement rather than randomization. One of the commonest uses of purposive sampling is in studies based on very small numbers of areas or sites. In these studies, variability with random selection is expected to be excessively large and, hence, potentially more damaging than the bias inherent in selection by judgement. Therefore purposively selecting the sample is more beneficial (Palys, 2008).

In general, if the budget is small and only a small number of areas can be included, one may choose these areas in a purposive way, perhaps ensuring that different types of affected towns, villages or areas were included (Palys, 2008). The researcher purposively sampled the dip-tanks in the villages of Hurungwe from where observations were made and from where respondents were then conveniently sampled.

3.4.2 Convenient Sampling

According to Khotari (2004), convenient sampling is quick, inexpensive, and convenient. Convenience samples are useful for certain purposes, and they require very little planning.

Researchers simply use participants who are available at the moment. The procedure is casual and easy, relative to random sampling.

Therefore, convenience sampling was used to select study participants who are cattle owners at dip tanks who would have come to dip their cattle. Those who were willing to participate in the research were included in the sample for follow up.

3.5 Study Sample size

According to Mugenda (2000), 10 to 30% of the total population can be sampled (if it is large) in a descriptive survey research, and if the population is very small, all of them can be interviewed. Due to the prevailing Zimbabwean Presidential Proclamation on the National Covid-19 Lockdown, the researcher could not travel to all the wards and villages of Hurungwe. As such, purposive sampling was used to sample a single ward. In this case, Ward 14 was selected judgementally based on the researcher's knowledge of its location at the boarders of Hurungwe, Gokwe and Makonde Districts. This renders it a low lying area in the Sanyati valley with low rainfall and high temperatures with scarce pastures, thus it was chosen as the study area.

There are three dip tanks in Ward 14 and for the purposes of sampling all dip tanks were included in the study ($n = 3$). The researcher then used the three dip tanks as respondent elicitation areas, with herdsman coming to the dip tank on a dipping day being conveniently selected for the sample. According to official dip man figures, an average of 40 households share a dip tank and as such, 20% of them (Mugenda, 2000) were conveniently selected ($n = 24$).

Key informants voluntarily participated and these included 1 Dip Attendant, 1 Vet Extension Officer, 1 District Vet Officer, 1 Village Head and 1 Village Councillor ($n=5$).

3.6 Data Collection

The research utilized two sources of data namely primary and secondary sources. Primary data was obtained from responses on the administered questionnaires as well as observations carried out by the researcher. Secondary sources provided information and data on cattle production, land holdings and land use as well as official figures from responsible authorities. This was achieved through desk review of data. Thus the researcher utilised interviews, observations and desk reviews as data collection methods. These yielded both quantitative and qualitative data.

3.7 Data management and analysis

At the end of data collection for each day, forms were cross-checked to ensure completeness. Tally sheets used were also cross checked by the researcher and filed. All data was captured into a Microsoft Excel (V.2016) tool to form a single dataset for exporting and analysis in SPSS (V.20). Descriptive data from chosen variables was summarized on frequency tables, cross tabulations and bar charts.

3.8 Research instruments

The researcher used a pre-tested structured questionnaire to get responses from the 24 respondents and another separate questionnaire to get responses from the 5 key informants. A tally sheet was developed and used to track and maintain data from observations on cattle types, numbers, among other observable phenomena. The questionnaire was pretested for accuracy and validity.

3.9 Plan for utilization and dissemination of results

All modifiable factors were identified and appropriate recommendations made to relevant authorities. Findings were presented to the stakeholders in the district. An academic presentation will be made at the university department as a defense for the dissertation

3.10 Research Ethics

The researcher sought clearance and approval from the Research Council of Zimbabwe as well as from the local body's ethics committee. The researcher prioritised the privacy of all respondents and all collected data was treated as confidential. Not at any point during the research were any animals subjected to cruelty and inhumane treatment. All respondents enrolled voluntarily and did so through informed and written consent.

3.11 Chapter summary

The chapter presented the research approach as well as the research considerations. The study assumed a descriptive research design which utilized a pragmatic research approach. Both primary and secondary data were collected using quantitative and qualitative methods.

Chapter four

Presentation of findings

4.1 Introduction

This section presents the research findings as well as the discussion on those findings.

4.2 Research findings

The assessment was on the contribution of cattle production on household food security in Hurungwe district. The researcher sought to identify the contribution of cattle production on food security as well as strategies towards food security through improved cattle production in Hurungwe district.

4.3 Characteristics of respondents

The characteristics of the sampled households as shown on Table 1 below included the respondent's sex, age, marital status, level of education, household size, size of household grazing land, herd size and composition, purpose of keeping cattle as well as the constraints they encountered in producing and keeping their cattle.

Table 1: Respondents' Characteristics

Variable		Male	Female	Total
Age	<18 years	1	0	1
	>= 18 years	14	9	23
Sex		15	9	24
Marital status	Never married	1	1	2
	Married	9	4	13
	Divorced	2	2	4
	Widowed	2	3	5
Level of education	None	0	0	0
	Primary	3	2	5
	Secondary	10	7	17
	Tertiary	2	0	2

4.4 Household Characteristics

Respondents were asked about their households' characteristics and their responses were as summarised in Table 2 below.

Table 2: Household Characteristics on different variables

Variable		Mean
Household size		6
Household landholding		0.5 ha
Household leadership	Child headed	1
	Adult headed	23
Household income		USD129.17

The average household size was 6 and the average landholding per household was 0.5 hectares. The average household income was \$129.17 and 1 household was child-headed. According to Coetze *et al.* (2005), households with many members are likely to have more needs and demands. Since cattle is a source of livelihood in Hurungwe through draught power for tilling land for crop food-sources which can later be sold to supplement income; as well as through provision of milk for consumption and selling; as well as for the beef market; larger households are likely to be faced with increased need to increase their cattle herd. The smallest household had 3 members; while the biggest household had 9 members.

The average household income was \$129.17; far below the poverty datum line for Zimbabwe. As Fidzani (1993) posits, a bigger household size translates into an increased demand for market goods (including food items) which will increase participation of the small scale cattle keepers in cattle production (Fidzani, 1993).

However, in this study, the indications are that large household size across the area did not significantly influence higher cattle production levels; as herds are generally small. The pastoralists have changed their lifestyle. They have shifted to tobacco production and salaried work as an alternative source of income and have thus reduced concentration on the size of cattle herds.

The land holding per household is very small and most of the respondents indicated that they relied on communal pastures to graze their cattle. There is an absence of the paddocking

system and the mean land holding was 0.5 hectares. This translates to a household's immediate dwelling yard which may consist of a vegetable garden, a small field, a kraal for the herd and for their houses. The rest of the land remains largely communal and increasing pressure on land (for dwelling, tobacco farming, etc.) may discouraging bigger cattle herds.

4.5 Household Food Security Situation

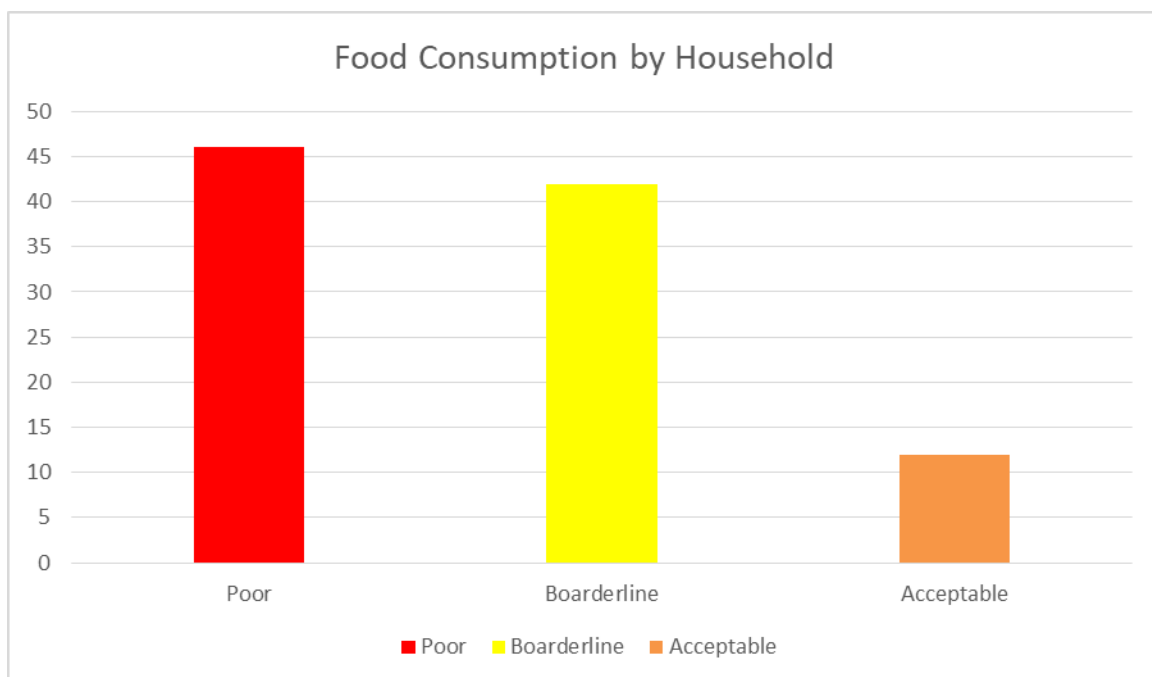
The researcher explored each household's food security situation by inquiring on the various dimensions of food security namely food consumption, food access, and coping strategies.

4.5.1 Food Consumption

Household food consumption data were collected using a 7 day recall period. Based on the frequency and dietary value of individual food items consumed, these data were then used to calculate a Food Consumption Score (FCS) for each household. Using established thresholds, these scores were then used to classify each household as having poor, borderline or acceptable consumption.

As shown in Figure 1, the results of this assessment for the study area suggest that 46% (n=11) of households surveyed in the area had poor consumption with the remaining 42% (n=10) and 12% (n=3) having borderline and adequate consumption respectively.

Figure 1: Percentage of households by food consumption group on different levels of food access



4.5.2 Food Access

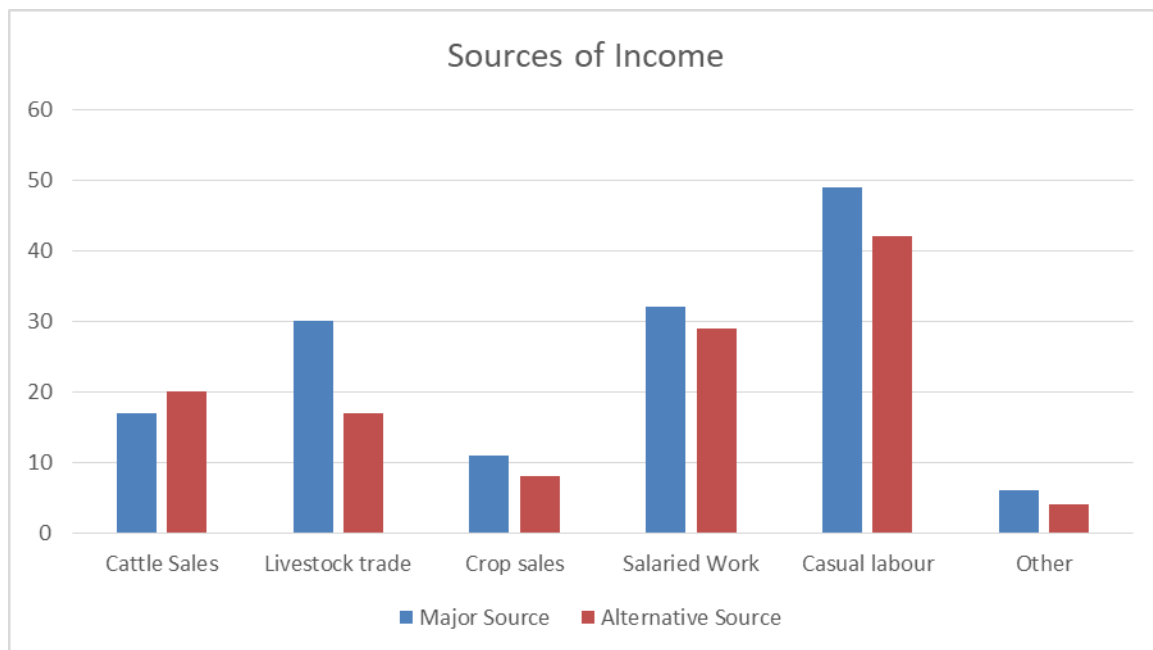
Food and Income sources

More than 60% of foods consumed by households surveyed came from market purchases with additional 20% from own production. The same disparity is true for staple foods with over 50% and 25% coming from markets and own production respectively. Both underscore the vulnerability of households to the marked increase in staple (and other) food prices this year in comparison to last as well as driven by the economic challenges characterised by high inflationary pressures as well as the Covid19 pandemic.

The main income sources in the area include casual labour, salaried employment, sell of firewood to tobacco farmers, sale of crops, livestock, and sale of cattle. According to respondents, sale of cattle was more pronounced in late 2019 and early 2020 due to distress sales driven by fears of disease (January Disease) which killed many cattle in several provinces of Zimbabwe in the same period. The sale of crops figures less prominently as an income source as crops are typically only sold in good years when household produce a surplus beyond what they can consume.

Households with one or more members that mentioned receiving salaries enjoy a relatively reliable and sustainable income throughout the year. Though the one problem to this is delays in salary payment and the erosion of real income through inflation – a problem cited by some such households. Figure 2 below shows various sources of income for the study area.

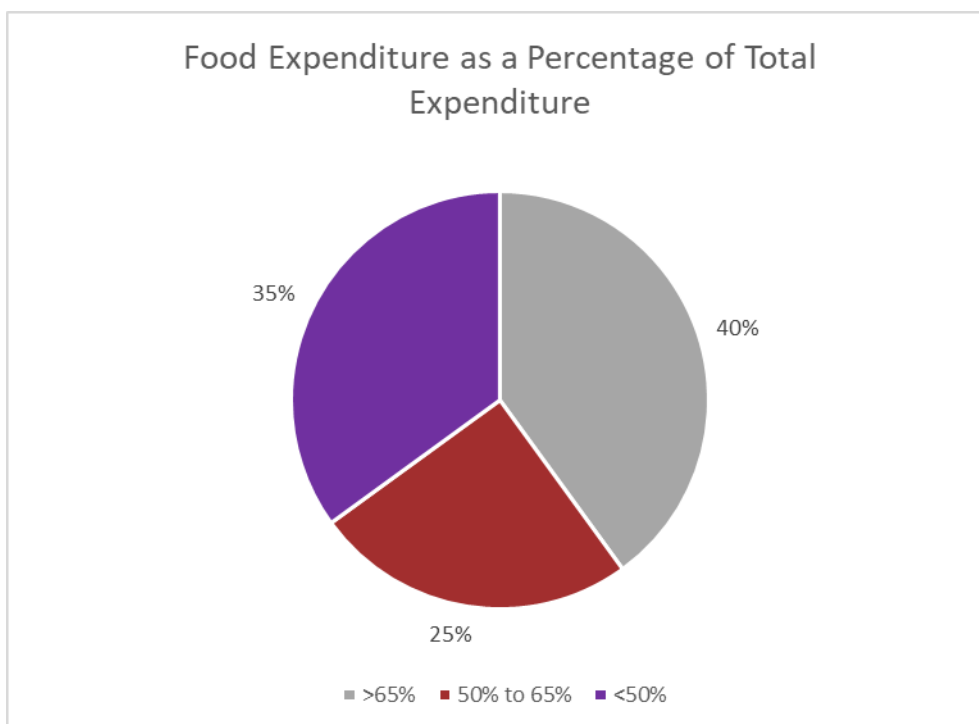
Figure 2: Sources of Income



Expenditure on food

Examining the percentage of expenditure spent on food provided the researcher with a proxy indicator of food security status. It also provided a measure of constraints on the ability by households to meet their food and non-food needs. Households spending more on food are vulnerable as this suggests that a household is forced to choose between their food and non-food needs or reduce consumption of one or both below their needs. This is shown on Figure 3 below.

Figure 3: Food Expenditure as a Percentage of Total Expenditure



4.5.3 Coping Strategies

Coping strategies are used by households to react to, or to manage food short-falls. Most of these households indicated that they had at some point used several coping strategies. The data on Table 3 shows the types of Coping Strategies employed.

Table 3: Coping Strategies employed by various households

Coping Strategy	Number of households (Frequency)	Percentage
Reducing number of meals consumed	10	42
Distress sale of assets (including cattle)	8	33
Unusual collection of wild fruit and food	4	17

Shifting to tobacco as a primary livelihood source	11	46
Collection and sale of firewood	7	29

Households interviewed indicated that they had to reduce or to skip number of meals taken per day (42%). Some indicated that they had to sell from their already small cattle herd as well as sell other forms of assets to supplement food (33%). 17% collected wild food and fruits while the largest proportion shifted to tobacco farming altogether, while 29% collected and sold firewood for energy.

However, some coping strategies mentioned by households like the selling of cattle reduces the cattle herd which according to responses provided is already small, with a mean herd size of 7. This further complicates the future ability of households to earn a living through crops as they will have no draught power for land preparation and tillage. More so, clearing fields for tobacco damages the already dwindling grazing lands; even so, their landholdings are small to justify meaningful tobacco output. Collection of firewood infers cutting down of trees and this further jeopardizes chances of rain for future agro-based activities.

The frequencies shown on Table 3 can be interpreted using the Coping Strategy Index (CSI), which in fact is a measure of food insecurity. Households that employed consumption coping strategies perceived to be severe and/or employed these and other consumption coping strategies frequently have higher CSI scores than those who employ less severe consumption coping strategies and/or employed these and other consumption coping strategies infrequently. As such, the higher the CSI for a household, the more food insecure.

4.6 Main Hazards and Opportunities for Food Security through Cattle Production

The main hazards during the past three months identified by the households interviewed were the prolonged dry spell and erratic rainfall, high food prices, livestock diseases and National Lockdown (as proclaimed by the President of Zimbabwe in response to the Covid19 pandemic).

The reduced rains were cited as impacting on households' ability to access water for both their animals and domestic use (75%); this was worse for crop production. High food prices

as seen in recent months also meant less to eat (92%). Small cattle herds facing the threat of animal disease also threatened food supply through animal deaths (59%), reduced milk volumes, and reduced draught power for food production; rendering them more food insecure as show in figure 4 below.

On the brighter side, interviewees stated that cattle production indeed represented an opportunity to leverage food supply and sustain optimal food security through milk, beef, animal sales (whose proceeds could be used to buy more food), and for tilling land for food crops. This is show on table 4 below.

Figure 4: Hazards to Food Security

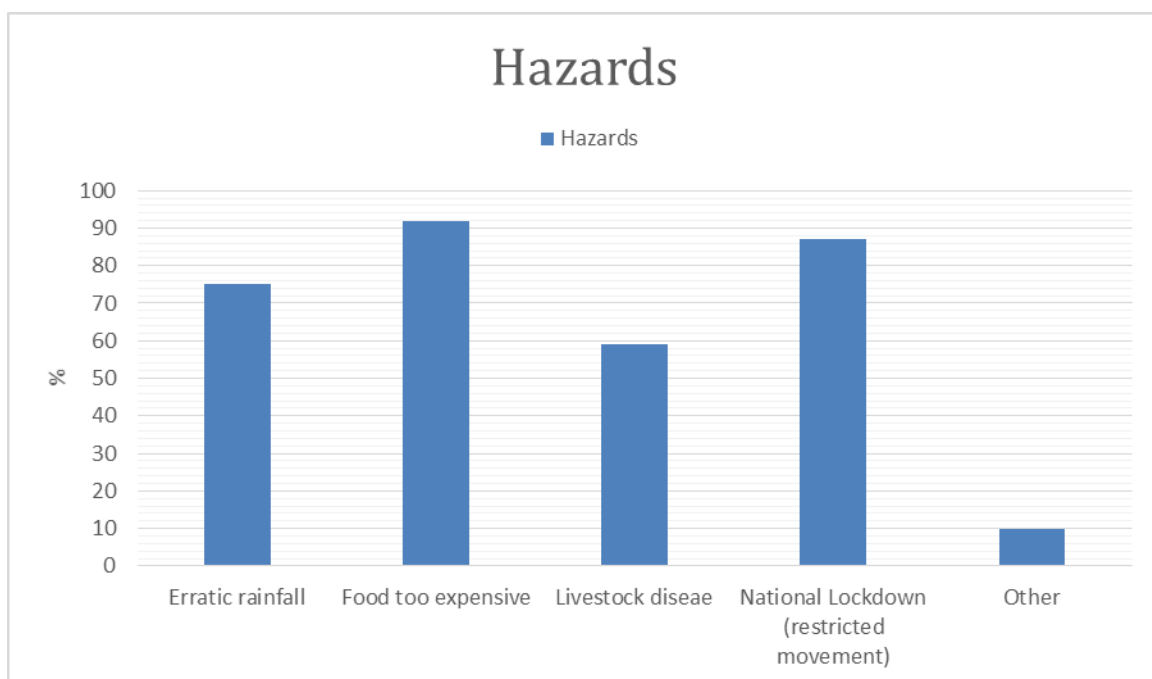


Table 4: Food Opportunities from Cattle Production

Food Opportunity	Frequency
Meat	20
Milk	24
Money	5
Crop-based tillage	24

The responses above showed that all respondents benefited from their cattle through milk (100%). 83.3% indicated that they had benefited through beef production, while 100% used their cattle for preparing land for crop-based food farming. Only 20.8% indicated that they had sold at least one herd to get money for other food items.

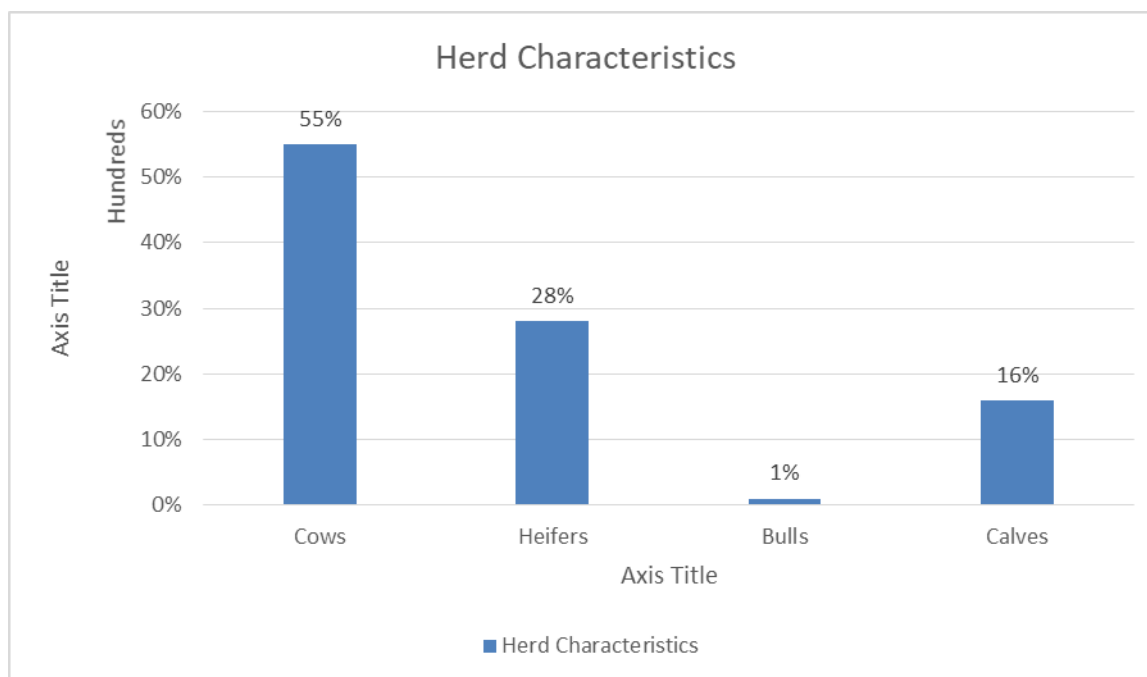
4.7 Cattle Herd Size and Structure

The study findings revealed that almost three quarters (n=18) of the cattle keepers kept indigenous breeds with an average herd size of 7 per household. Respondents keeping indigenous breeds indicated that they were kept mainly because they are hardy, can survive on poor grazing and extensive walk to water points and in search of grazing although they mature slowly and have low productivity. The slow growth and low productivity translates into delayed maturity of the indigenous cattle thus contributing to the deficit of animals (small cattle herd) that would be available for: selling; milk production; beef production; and; draught power for crop production. Thus type of breed, as in this case, Indigenous Hardy-Mashona, is largely a cause of low cattle production with the mentioned food security implications.

Six (6) cattle keepers (25%) cited the occurrence of at least one crossbreed animal in their cattle herd. There were no pure breeds. Cross breeds were indicated as having a heavier body weight and at the same time are hardier to harsh conditions and diseases. Breed improvement programmes were severely impacted by economic challenges which rendered structural institutions for support and guidance less effective. Also, improving the herd would mean a higher selling price which buyers on the market are not willing to pay and as such farmers are left with little or no incentive to improve their herd, hence the low number of cross breeds, and the non-existence of exotic pure breeds. Ultimately, there is low cattle production.

The structure of the respondents' cattle herds were mainly dominated by female cows constituting 55%, followed by heifers (28%), calves (16%) and mature bulls 1% as shown on figure 5. As can be noted in this figure, the percentage composition of the bulls was low because the bulls were sold while still young as yearlings. This also translate into low reproductive ability of the communal herd. It was also noted that cows of a reproductive age were either sold as a mitigatory measure to food insecurity or lost to disease, further reducing cattle production.

Figure 4: Cattle herd size, Composition and Structure



4.8 Purpose for Keeping Cattle

While cattle rearing was associated with prestige, cultural purposes like lobola payment, provision of draught-power, as well as a store of wealth; respondents also indicated that they kept cattle for food security as shown in Table 4 above through provision of milk (100%), provision of beef (83.3%), preparing land for crop-based food farming (100%), as well as through proceeds from sales (20.8%) which could be used to buy other food items.

4.9 Sources of cattle for stocking purposes

Findings presented in figure 5 revealed that cattle keepers acquired their cattle from relegated births (83.3%), 33.3% inherited their cattle, while only 12.5% bought their herding stock from the market. The researcher observed that the significant proportion of the cattle herds were acquired through relegated births rather than through the market. With the market only being used to offload their animals in the wake of food insecurity or disease scares. No cattle breeding programmes were cited.

4.10 Factors affecting cattle production

Respondents stated that butcheries in the local growth points were their only market outlet. This provided them with little incentive for growing their stock as they had less bargaining power and due to economic forces; the market was getting more and more inefficient and less

encouraging. Of the interviewed respondents; 62.5% cited lack of efficient markets as a factor for not increasing cattle stock. Lack of information on markets was also cited by 20.8% and absence of cattle breeding programmes was also noted (66.7%). 91.7% concurred that diseases were a major threat to their animals and that costs of chemicals and medicines were too prohibitive. Pasture scarcity was also cited as a factor (70.8%). This is shown in table 5.

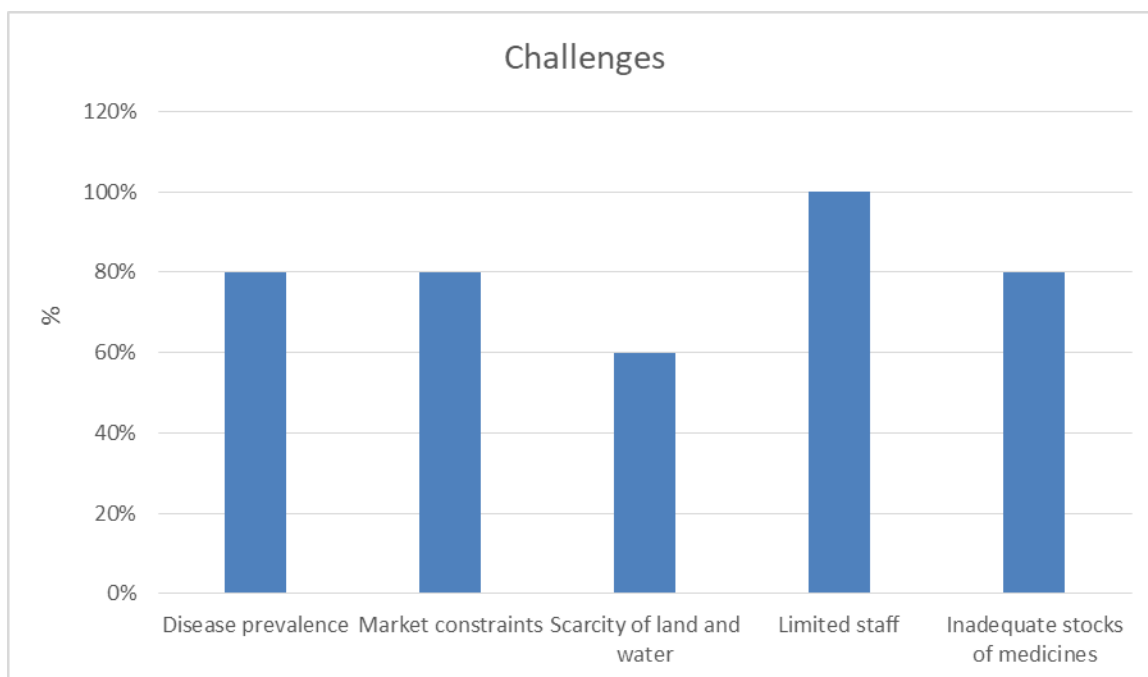
Table 5: Factors affecting cattle production

Factor for not increasing stock	Frequency
Inefficient markets	15
Lack of Information	5
Lack of breeding programmes	16
Threat (and, or; occurrence) of diseases	22
Pasture scarcity	17

4.11 Key informant findings

Key informant interviews were also conducted. Respondents included the headman, village councillor and trained agricultural extension officers. They gave the following insights on constraints to cattle production in the area as shown on figure 5.

Figure 5: Challenges in Cattle Production



80% cited disease prevalence, market constraints as well as inadequacy of medicines as factors liable for poor cattle production. Inefficient control of diseases outbreak was attributed to the limited number of veterinary officers available (100%). 60% also said scarcity of key resources like land and water were also reasons for poor cattle production.

4.12 Strategies for improving cattle herds

Respondents cited market incentives would propel them into raising their stock as supported by adequate agricultural extension services (41.6%). Creation of water reservoirs was also cited and nipping land grabs for dwelling to preserve pasturelands was also encouraged (12.5%). Respondents also cited government intervention through deployment of more vet officers (54.2%) and supply of good breeds through better breeding programs (58.3%). This is shown in table 6.

Table 6: Strategies for improving cattle herds

Strategy	Percentage
Market incentives	41.6%
Pastureland and water management	12.5%
Deployment of vet services staff	54.2%
Better breeding programs	58.3%

4.13 Chapter Summary

The chapter presented findings from the field where 24 respondents were interviewed. 5 key informants were also interviewed and their responses were presented. Findings confirmed that indeed cattle were a source of food in the area and that indeed there were low cattle numbers. The average herd size per household was seven and the mean land-holding was 0.5 hectares. Cattle provides food in the form of milk and meat. The cattle could also be sold to provide money to buy other food items. However, disease outbreaks, inadequate disease controls and scarcity of pasture and water were indicated as factors limiting growth of cattle herds. Most of the households were food insecure and some were shifting to other agro-based activities for food security.

Chapter 5

Conclusion and Recommendations

5.1 Introduction

The aim of this study was to assess the contribution cattle production on household food security in Hurungwe, Mashonaland West Province, Zimbabwe. This chapter shall therefore present conclusions from the assessment and provide actionable recommendations for farmers and stakeholders in the district

5.2 Conclusion

The study looked at the household food security situation in the district by assessing food security dimensions of access, consumption as well as coping strategies. From these dimension, and according to research findings; it was clear that 46% had poor food consumption while only 12% had adequate food consumption. The remaining 42% had borderline food consumption. Per these findings, it can thus be concluded that there is food insecurity in the surveyed households.

Casual labour was the main source of household income followed by salaried income, then livestock trade and cattle sales; in that order. Findings suggest that these incomes are then used to purchase food items from the market. 60% of the food consumed was coming from the market. 20% was from own production. At least 50% of staple food (maize) was being bought from the market. It can also be seen that the households have little capacity to produce their own food and rely on buying and only little was coming from agricultural activities.

While 42% have reduced their number of meals; 33% have disposed of their assets and these include cattle so that they may have money to buy food. 46% have shifted to tobacco farming altogether.

The soaring prices of food was cited as a threat to food security as well as the prevalent livestock disease as accompanied by inadequate agricultural extension support. While these findings hold true; and indeed the risk of animal disease is high; the herd size of many households remains low due to poor restocking practices, lack of land for grazing and water as well as lack of bulls to support the growth of the communal herd whereby bulls constituted only 1% of the identified cattle herd. These practices does not seem to support increased cattle production and farmers seem to have little incentive to increase their cattle herd.

While findings show a link between cattle production and food security, whereby, households cited cattle as a source of meat (83.3%, milk (100%), income source (20.8%) and source of draught power for tilling land for subsequent food production (100%); the absence of cattle; or, the occurrence of cattle in very small herds or numbers can be used to suggest the inverse food security status as all the cited benefits from cattle will be inversely impacted. Therefore; it can also be concluded that indeed, cattle is a food source in the district; the absence of which negatively impact the food security status of the households. Therefore low cattle production is also causing food insecurity in the district.

Causative factors for low cattle production have been noted as poor breeding practices where only 1% of the community herd is made up of bulls; poor restocking practices, where 83.3% is from relegated births and there are no better breeds in the district, scarcity of land and water also cause poor cattle production. Findings also seem to suggest that there is inadequate information for the farmers; the ever impending threat of cattle diseases, poor market systems and a lack of government supported programmes, all come together as disincentives to cattle production – which further compromises household food security as noted in the findings.

On the other hand, the household food security status is not entirely dependent on the existence of cattle as household buy their food from other income sources. Some households sell firewood and crops and earn salaries from respective jobs. Also; some households cited that cattle were only kept for prestige; and for settling off lobola payments, and were not necessarily a food source for them.

It can thus be concluded that while some households don't look up to cattle as a food source, or as a means by which they can earn or grow food crops; cattle production in the district is really low and this is causing household food insecurity. The household food security status can be greatly improved by increasing cattle herds in the area.

5.3 Recommendations

From the findings the following recommendations can thus be made:

1. Introduction of a structured cattle breeding programme from which cattle farmers can cross their animals or acquire better breeds from since those from the existing markets are largely expensive. This will prop-up the cattle herd by the introduction of genetically stronger breeds which can resist diseases better.
2. Introduction of by-laws which limit desertification through increased land apportionment for settlement and agriculture in the local communities. This can be

done through cooperation with Chiefs and Village Headmen so that more land is preserved for pastures. This will be seen as an incentive to keep more cattle.

3. Excavation of a dam with the support of the District Development Fund to water local animals. This will also support agro-based food production through irrigation.
4. Recruiting and deploying more agricultural extension services officers in the area who will give advice, guidance and information on cattle production. However, these officers will require better salaries and sufficient medicine stocks to make their work feasible in the wake of economic and disease challenges.
5. Regulations of markets so that the farmers are not abused by butchery owners. This can further be strengthened by creating alternative markets where farmers can link and sell to distant markets which are competitive and better in terms of prices and rewards to the farmer. Thus there will be need to reduce the cumbersome need for paperwork to have cattle meat processed and shipped to distant markets like those in Harare and other provinces as this may impede market efficiencies.

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Annexes

Annex 1: Informed Consent Form



A RESEARCH ASSESSING THE CONTRIBUTION CATTLE PRODUCTION ON HOUSEHOLD FOOD SECURITY:THE CASE OF HURUNGWE DISTRICT

MASHONALAND WEST

ZIMBABWE

Principal Investigator:

Pazara Innocent

B1850824

Phone No.: 0773364202

What you should know about this research:

- We give you this consent form so that you may read about the purpose, risks, and benefits of this research.
- The main goal of this research is to gain knowledge that may help you and the community.
- We cannot promise that this research will benefit you directly.
- You have the right to refuse to take part, or agree to take part now and change your mind later.
- Whatever you decide, it will not affect your regular service.
- Please review this consent form carefully. Ask any questions before you make a decision.
- Your participation is voluntary.

Introduction:

My name is Pazara Innocent. I am a Food Security and Sustainable Agriculture student with the Bindura University of Science Education. I am conducting a research on the implications of low cattle production on household food security in the Hurungwe District. Before you decide to volunteer for this research, you must understand its purpose, how it may help you, the risks to you and what is expected of you.

Purpose and significance of the study

The purpose of the study is to identify the contribution of cattle production on household food security. An understanding of the implications will help inform decision making on program implementation in the area. The findings from the study will assist in coming up with recommendations to enable the development of sound cattle breeding programs and future food security interventions in the district.

Procedures and Duration

If you decide to participate in this study, you will undergo an interview which may take 10-30 minutes. If you have questions about the study, you may ask at any time. Your dip-tank card may be reviewed to verify your cattle herd.

Risks and Discomforts

There are no physical risks and discomforts associated with this study.

Benefits and / or Compensation:

There are no direct individual benefits such as cash payments that will come from participating in this study. However, in the long term, you will indirectly benefit, since the findings from the study will be used to improve policies and programs.

Alternative Procedure or Treatments:

There are no interventions or treatments that will be done in this study.

Confidentiality

If you indicate your willingness to participate in this study, information collected about you and your responses will be treated with confidentiality. The questionnaire to be used during the interview will be identified by a code (number) instead of your name. This consent form will be separated from the coded questionnaires and stored in a secure place.

We plan to disclose any information found in this study to the Academic panel of the Bindura University of Science Education. Results may be shared at different fora but only for the purpose of improving food security in the area. No personal information will be disclosed to anyone hence the absence of any names on these questionnaires. Any information that is obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission.

Additional Costs

You will not incur any expenses from participating in this study.

In the event of injury

In the rare event of injury resulting from your participation in this study, treatment can be obtained at the nearest health center. You should understand that the costs of such treatment will be our responsibility. Financial compensation is not available.

Voluntary Participation

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect the quality of service you receive if you visit any dip-tank or any agro-based services provider.

Additional Elements

Should you decide to withdraw from this study and its procedures at any stage, you are free to do so. There will be no penalty for withdrawal. I may terminate your participation in this study without your consent if your participation puts you at risk. Should this happen, I will inform you.

Offer to Answer Questions

If you have any questions on any aspects that are not clear to you about this study, please feel free to ask me before you sign this form. You are free to take as much time as you can to think about it.

Authorization

By signing this form, it means that you have read and understood the information provided above, had all your questions answered, and decided to participate voluntarily without being coerced and can choose to stop your participation at any time without loss of any benefits entitled to you. You authorize me and my field and academic supervisors to access the

information that you will have provided. The information you provide will only be used for the purpose of this study.

Name of Research Participant (please print) _____
Date

Signature of participant / legally authorized representative _____
Time

Signature of staff obtaining consent

For any further information pertaining to this study, please feel free to contact me at:

Bindura University of Science Education,

Faculty of Agriculture

Or on my phone; 0773364202

YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP

Annex 2: Questionnaire for Respondents

Questionnaire number..... District..... Date/...../.....

Good Morning/ Afternoon. In fulfilment of my academic studies; I am carrying out an research on low cattle production in Hurungwe. I will be thankful if you could spare some times to go through the questionnaire with me. I will ask a number of questions and note your responses. Thank you.

Section A: DEMOGRAPHIC DATA *(fill in or tick where appropriate)*

1. Age _____
2. Sex
 - i. Male
 - ii. Female
3. Marital status
 - i. Single
 - ii. Married
 - iii. Divorced
 - iv. Widowed
4. Level of education
 - i. None
 - ii. Primary
 - iii. Secondary
 - iv. Tertiary

Section B: Household Characteristics

5. Total members of your household
 - i. Male.....
 - ii. Female.....
6. Total land area belonging to your household
 - i. Hactares.....
 - ii. Acres.....
7. Who is heading your household?
 - i. Parent
 - ii. Child
8. What is your household income range?
 - i. \$100 - \$200
 - ii. \$201 to \$300
 - iii. Above \$300

Section C: Household Food Security Situation

9. In the past seven days, were you worried that you might not have enough food to eat?
 - i. Yes
 - ii. No
10. In the past seven days, did you have a limited variety of food to choose from?
 - ii. Yes
 - ii. No
11. In the past seven days, did you have to take a smaller meal than desired?

- iii. Yes
 - ii. No
12. Did you have no food at all in your household, at any point, in the past seven days?
- iv. Yes
 - ii. No
13. Did you have to sleep on an empty stomach at least once in the past seven days?
- v. Yes
 - ii. No
14. Did you have to spend 24 hours without eating any food at all in the past seven days?
- vi. Yes
 - ii. No
15. What are your sources of income?
- i. Cattle sales
 - ii. Livestock trade
 - iii. Crop sales
 - iv. Salaried work
 - v. Casual labour
 - vi. Other (specify)
16. When faced with a food insecurity; what are your coping strategies?
- i. Reduce number of meals
 - ii. Sell assets
 - iii. Collection wild fruit and food
 - iv. Grow tobacco
 - v. Collect and sale firewood
17. How does cattle provide you with food?
- i. Meat
 - ii. Milk
 - iii. Money
 - iv. Food from crop-based tillage activities
18. What is limiting your food security status?
- i. Erratic rain
 - ii. Price of food
 - iii. Livestock diseases
 - iv. National Lockdown
 - v. Other (specify)

Section D: Cattle Herd Size and Structure

19. How many of the following do you own?

- i. Pure breed
- ii. Mixed breed
- iii. Indigenous breed
- iv. Cows
- v. Heifers
- vi. Bulls
- vii. Calves

20. Why do you keep cattle?

- i. Source of wealth
- ii. Source of prestige
- iii. Source of food
- iv. Cultural and social reasons
- v. Draught power

21. How do you restock your cattle?

- i. Relegated births
- ii. Inherit
- iii. Buy from market

22. What is the cause of low cattle production in your area?

- i. Inefficient markets
- ii. Lack of Information
- iii. Lack of breeding programmes
- iv. Diseases
- v. Pasture and water scarcity

Thank you; we have reached the end of this interview

Annex 3: Questionnaire for Key Informants

Questionnaire number..... District..... Date/...../.....

Good Morning/ Afternoon. In fulfilment of my academic studies; I am carrying out a research on low cattle production in Hurungwe. I will be thankful if you could spare some times to go through the questionnaire with me. I will ask a number of questions and note your responses. Thank you.

Section A: DEMOGRAPHIC DATA *(fill in or tick where appropriate)*

1. Age _____
2. Sex
 - i. Male
 - ii. Female
3. Marital status
 - i. Single
 - ii. Married
 - iii. Divorced
 - iv. Widowed
4. Level of education
 - i. None
 - ii. Primary
 - iii. Secondary
 - iv. Tertiary
5. Role in cattle production
 - i. Dip Attendant
 - ii. Vet Extension Officer
 - iii. District Vet Officer
 - iv. Village Headman
 - v. Village Councillor

Section B: Perceptions on Cattle production

What are the challenges faced by cattle keepers in the area?

- i. Prevalence of diseases
- ii. Market constraints
- iii. Scarcity of land and water
- iv. Limited agriculture extension services staff
- v. Inadequate medicine supplies

What strategies do you recommend for improving cattle herds?

- i. Market incentives
- ii. Pastureland and water management
- iii. Deployment of vet services staff
- iv. Better breeding programs

Do you have any other comments on cattle production and food security in the area?

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