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## THE CONTRIBUTION OF SMALLHOLDER BEEF CATTLE FARMING TO HOUSEHOLD DEVELOPMENT IN CHIPINGE RURAL DISTRICT, ZIMBABWE

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### ABSTRACT

Smallholder beef farming is a critical tool for combating rural poverty. Several less developed countries have promoted smallholder beef farming with twin objectives to encourage rural development and sustainable rural livelihoods. This study was conducted in Chipinge South Rural District, Manicaland Province, Zimbabwe, with the aim of examining the extent to which smallholder beef farming contributes to rural household development. An assessment was made to ascertain the level of household development for the sampled respondents before and after the beef farming project intervention. An embedded mixed method approach, which combines qualitative and quantitative approaches, was used in the study. The research made use of key informant interviews, focus group discussions, questionnaires, observations and project reports in the collection of both quantitative and qualitative research data. A multi-stage sampling technique was adopted in the study and out of a total population of 1740 farm households in Chipinge South, a sample of 174 farm units was selected from all the six farmer groups registered and operating under the Chipinge Livestock Development Trust (CLDT). In addition, 30 key informants were conveniently sampled for interviews among members of the project management, extension staff, and farmer committee leaders. The results from the study showed that smallholder beef farming enhanced the economic status of the smallholders which translated into improved household assets, better education, adoption of new technology, capacity building and improved food security, among others. While the beef farming project yielded notable benefits to rural households in Chipinge South, the project's ability to foster sustainable rural livelihoods in the long run was negatively affected by, among other factors, limited access to key livelihood capitals. The study recommends that the responsible authorities in Chipinge South Rural District urgently address the challenges threatening the sustainability of the project in order to promote long-term investment in the beef farming sector in the study area.

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### INTRODUCTION

Poverty is one of the world's most intractable human development challenges. Close to 1.5 billion people (UNDP, 2019) worldwide are deemed to live in abject poverty, with the worst affected people being those in rural areas. Perpetuality of food insecurity and rural underdevelopment motivates current debate on what strategies to employ to combat rural poverty in an effective and sustainable manner, especially in less developed countries (LDCs), where incidentally majority of the world's poorest people live (ibid.). Among other strategies, smallholder agriculture has been promoted as a key driver for rural development. One of the key priorities has been to increase agricultural production and exportation by the rural based farmers. According to the Food and Agricultural Organisation (FAO, 2016), peasant farmers who are empowered to grow more food attain higher incomes and better living standards. Within the realm of the small-scale

agricultural sector, smallholder beef cattle farming occupies a special niche and has the potential to improve rural livelihoods. In Sub-Saharan Africa, small-scale beef cattle farming has allowed poor communities to escape from the vicious cycle of deep poverty (Blake, 2016; Agyeman and Nkonjera, 2017; Blein, 2018). In Zimbabwe, beef cattle production plays a critical role in the livelihoods of the rural poor as it contributes to their nutrition, transport and financial security, among their different needs. Beef cattle production is a source of income for most smallholder farmers in rural Zimbabwe. Beef cattle also fulfil a crucial role in social and cultural events of rural populations. The country's entire rural population is directly or indirectly linked to cattle farming practices (Anseeuw et al., 2014).

Commercial beef production was started in Zimbabwe as early as in 1912 (Matinhira, 2001). Owing to unjust and exploitative

colonial practices and policies that preferred the minority white farming community, commercial beef cattle farming was solely a prerogative of the large-scale commercial farmers. Their beef farming projects were meant to satisfy the “national needs” (Matinhira, 2001). The infrastructure was also intended and deliberately designed to facilitate the supply of beef and all its by-products to people who resided in urban areas, who constituted only 30% of the country’s entire population. Throughout this period of white colonial domination, smallholder beef cattle farming was principally for subsistence purposes (Cluer, 1980). With the attainment of independence in 1980, the new political administration in the country expressed its desire and determination to improve the condition of the smallholder beef sector while maintaining production in the large-scale sector. The government mainly focused on commercialising the smallholder beef sector.

The government viewed the commercialisation of smallholder beef farming as a double-barreled strategy for achieving rural livelihood diversification and agricultural intensification. Its objectives were twofold. Firstly, the government aimed to achieve rural development through “modernisation” of the smallholder agricultural sector at large (Rukuni and Eicher, 1994). Secondly, commercialising beef cattle farming represented part of the government’s effort at redressing colonial imbalances regarding land and agriculture. The overall aim was to reduce the aforementioned dualism of peasant and commercial large-scale agriculture. The government targeted farmers in both resettled and communal areas. Efforts at commercialising the smallholder beef sector intensified in the post -2000 period. This period saw a significant rise in new players venturing into and dominating the beef sector as smallholder livestock farmers. These new beef farmers were taking over from large scale white commercial farmers who were displaced by the Fast-Track Land Reform Programme (FTLRP) (Enos et al., 2006). The Crop and Livestock Assessment Report published by the then Ministry of Agriculture, Mechanisation and Irrigation Development (MAMID) in 2017 revealed that, after the FTLRP, over three point one (3.1) million of the estimated five point one (5.1) million cattle that comprised the national herd in 2013 were owned by smallholder farmers, and their animals accounted for about 87 percent of the local beef industry. This was a significant departure from 1998, just before the FTLRP, where smallholder farmers owned approximately one point five (1.5) million cattle out of four point nine (4.9) million cattle that comprised the national herd then (MAMID, 2017). The idea was to produce adequate beef for the nation and meet the demand that was created by the departure of a number of large scale white commercial beef producers.

During the same period, the government called on all parastatals and other players to encourage indigenous Zimbabweans to participate in agricultural sectors which had, hitherto, been dominated predominantly by white large-scale commercial farmers. Commercial smallholder beef production was pursued through the state-private sector agricultural driven “modernisation” efforts. The aim was to ensure a shift within the smallholder beef production systems from subsistence to entrepreneurial capitalist agricultural production. It was against this backdrop that commercial smallholder beef cattle farming

was promoted in the Chipinge South area of Zimbabwe in early 2000. Whilst livestock production is not a novel phenomenon in Chipinge South; the commercial beef farming initiative is definitely a relatively new intervention. It was never envisioned that smallholder commercial beef farming would be a viable proposition in the district considering the history of poverty and aridity in the area. The beef farming project was therefore a key game changer in the quality of livelihoods of the rural poor in Chipinge South. The project was envisaged to be an essential vehicle for household development and poverty reduction in Chipinge South Rural District. The aim of this study was therefore to assess the contribution of smallholder beef farming to household development in Chipinge South Rural District. Household development is defined as the economic well-being of households in terms of their ability to have adequate access to goods and services produced in an economy. It is an integrated process, which includes the political and socio-economic well-being of households.

To draw inferences on the contribution of smallholder beef farming to household development, the study used household development indicators like changes in asset ownership, employment levels, income and savings, material possession, human capital development, adoption of technology, food security and nutrition levels. Chipinge South Rural District is located in the lower south of Chipinge District, Manicaland Province, bordering Mozambique to the east and south. The area is generally arid and lies in a valley. The beef cattle farming project in the area is a typical communal farming activity covering a total land area of approximately 5 393km<sup>2</sup> with a total of 1740 beef cattle farming households registered under the Chipinge Livestock Development Trust (CLDT, 2016). In his study of smallholder beef farming in the Monze District of Zambia, Ariota (2016) demonstrates how smallholder beef farming can be used to determine one’s status in the community. He traces the history of smallholder beef farming in Zambia and he concluded that smallholder beef farming was a major cause of differentiation among the rural poor. Based on extensive survey data from Tanzania, Vantsa (2015) demonstrates that beef farming projects are an effective instrument for reducing poverty among the rural poor as they impart local people with the skills to become self-employed. Vantsa argues that such projects allow the participation of the local poor people more than other types of poverty reduction activities. Kandjou (2016) conducted a study to evaluate the impact of small-scale beef farming projects on poverty alleviation, development, economic growth and on the livelihoods of the Namibian livestock rearing population of the Omaheke region. According to Kandjou, commercialisation of smallholder beef farming in this area opened many opportunities for the survival of the rural poor. For example, beef farming has created many job opportunities for rural households. Tarus (2016) found that smallholder beef farming plays an important role as an income and employment generating activity for the majority of farm households in Western Gambia.

Staal (2016) reported that smallholder beef production plays a significant role in the rural economy of Cameroon. The farming sector constitutes an estimated 32 percent of the agricultural GDP and is a major livelihood option for over

600,000 rural households. Subscribing to the above observation, Hervin (2017) avers that the importance of beef farming in rural Cameroon and its contribution to sustaining livelihoods in many of the country's rural areas, where about 55 percent of the population reside can therefore not be underestimated. The sector's valuable role in sustaining smallholder crop-beef farming systems through its combined effects of nutrient cycling, income generation capacity, job creation as well as household food security places the sector in a position to continue playing a leading role in rural transformation in Cameroon, both in the present and in the future.

Banda (2016) observed that smallholder beef farming constitutes an important portion of the GDP (9%) and is a major vehicle for rural growth and development as it offers employment to approximately 50% of the labour force in Malawi. The sector also provides above 55% of the beef and beef products being consumed in the country. Sirgado (2016) observed that smallholder beef farming was promoted as an alternative livelihood option to address rural household needs and spearhead local economic growth in Rwanda. A study of smallholder beef farming in Mauritania proved that smallholder beef farming projects are practical vehicles for sustainable rural development and capacity building for rural based communities (Gertler, 2017). In a study of the Nguni beef cattle farming initiative in the Eastern Cape of South Africa, Musemwa (2008) concludes that smallholder beef farming has multiple benefits for the smallholders. From an economic viewpoint, he notes that smallholder beef farming enhances food security, is reliable source of cash income and makes an important asset portfolio as well as investment opportunity while, from a social viewpoint, beef farming venture builds relationships and addresses gender imbalances. In a related study carried out in the Limpopo Province of South Africa, Stroebel et al. (2008) note that smallholder beef farming makes a valuable contribution to food security indirectly by increasing crop output.

While smallholder beef farming in a number of less developed countries has contributed meaningfully to employment generation and poverty alleviation, research has shown some exceptions to this positive development. Kinsley (2013) noted that smallholder beef farming did not contribute much to the well-being of rural households in the Morrumbala District of Mozambique. Lack of adaptation to "modern" new beef cattle breeds by the smallholder farmers is cited as the major factor behind this failure. In rural Uganda, poverty remains the main challenge despite the presence of numerous smallholder beef farming projects. Poor farmer beef practices have been cited as the major challenge bedeviling the beef farming sector (Okaje, 2017). Okaje notes that most of eastern Uganda's beef farmers are smallholders using local breeds that are not very productive.

Woldentensaye (2018) carried out a desktop study on small-scale beef farming projects in two rural communities in the Oromia region of Ethiopia and reported that the sluggish growth and slow process of commercialisation of the beef cattle farming sector was mainly a result of a complex combination of factors. The factors included, among others, environmental, biological and socio-economic aspects. Nifeg (2017) expounded that the inability of smallholder farmers to

access lucrative beef markets and the failure of the government to involve the smallholder farmers in the decision-making process were hindering the growth of beef farming in Suriname. Ajorto's (2016) study on the status of beef farming in the Enugu North Agricultural Zone of Enugu State, Nigeria revealed that small-scale beef farming has largely been restricted to subsistence levels. Restricted access to credit facilities was the major hindrance to the intended beef farming beneficiaries. Thus, though useful as a vehicle for empowering rural households and safeguarding sustainable rural livelihoods, small scale beef farming is limited in its impact owing to a number of challenges.

Underpinning the study is the Sustainable Livelihood Framework (SLF) developed and popularised by the Department for International Development (DFID) in 2000. DFID (2000) postulates that households earn a living through five (5) forms of assets, namely social, human, financial, physical, and natural types of capital. The concept of social capital is used to refer to individuals' private relations and networks/connections, the assurance of trust and communal support that beef cattle farmers receive from other farmers and various social engagements within their networks. The natural form of capital encompasses the piece of land that is provided to farmers by the government alongside other resources like water and forest. Human capital is conceptualised as the education level, knowledge levels and farming capabilities that farmers have acquired from various institutions. The financial form of capital involves the cash and loans secured by farmers to improve their farming enterprises. Physical capital is used to refer to fixed assets like machines, technology, infrastructure and communication equipment.

The interconnectedness of these five (5) types of assets or forms of capital are important in upholding sustainable rural livelihoods. For example, it has been noted that in a number of communal areas, the government has equipped smallholders with natural capital, that is, the piece of land, but this provision has not been complemented with other forms of capital to improve sustainable rural livelihoods (Tauro, 2013). The key focus of this study is, therefore, mainly grounded on the contribution of smallholder beef cattle farming in enhancing the well-being of rural households in Chipinge South. For the smallholder beef cattle producers, the SLF is valuable in evaluating the contribution of beef farming as an entrepreneurial cash generating initiative for the betterment of livelihoods in this community. The key factors that affect sustainable beef cattle farming projects and poverty alleviation are examined. The framework also unpacks a vital connection between various aspects that have a direct bearing on the efficiency and effectiveness of smallholder beef cattle farming projects. The concept of sustainability in the SLF involves livelihood adaptation and enhanced resilience as well as avoiding threatening the natural resource base.

## **MATERIALS AND METHODS**

An embedded mixed method approach, which blends qualitative and quantitative approaches, was used in the study. The qualitative methodology was more dominant owing to the fact that the research involved the study of social phenomena

made up of values and perceptions that are difficult to quantify. The study used multiple data collection tools and the farm household is the basic unit of analysis. The data were collected over a period of three (3) months from August to October 2021. The target population for this study consisted of all the 1740 households registered for the beef farming project. A multi-stage sampling technique was adopted in the study. The random quota sampling technique was used in selecting the targets for the research and then the simple random sampling method in selecting the actual respondents for the household questionnaires. Out of a population of 1740 farm households in Chipinge South, a sample of 174 farm units was selected from all the six farmer groups in the area, where each farmer group was represented by 29 farm households. A list of the farm households was supplied by the project's management. Of the 174 farm households, 68 percent were male-headed, while 32 percent were female-headed. A household questionnaire was then administered on the selected respondents, together with six (6) focus group discussions (FGDs) and thirty (30) key informant interviews sampled from among members of the project management staff, farmer development committees and extension workers. The key informants were conveniently selected on the basis of their accessibility and willingness to partake in the research. The observation technique was also used to identify the key household assets that the smallholder farmers obtained through their participation in smallholder beef farming. A

review of relevant documents was carried out in order to have an in-depth understanding of the project area.

## RESULTS AND DISCUSSION

### Benefits of the Chipinge South Beef Farming Project to Household Development

Beef farming ushered in a number of positive changes at the individual household level in Chipinge South Rural District. The beef farming project managed to improve the lives of rural households through job creation, asset ownership, income and savings, material possession, human capital development, adoption of new technology, capacity building and food security, among other benefits. A detailed discussion on the contribution of the beef farming project to household development in the district is presented below.

### Income Generation

The beef farming project increased the incomes of the rural smallholders in Chipinge South. To evaluate the contribution of the project to household income, the research looked at the annual household income levels before and after joining the beef farming project. The income includes both cash and non-cash returns. The cash returns for a beef cattle enterprise are derived from both beef sales and the sale of live animals, surplus female calves, manure and milk. The non-cash returns are derived from beef sold in kind, beef retained for home consumption and beef given to relatives and neighbours.

Table 1. Annual household income before joining the beef farming project.

Range of Income USD	Respondents (N=174)	
	Frequency	Percentage
500 - 1000	77	44.2
1000 - 2000	66	37.8
2000 - 2500	31	18
Total	174	100

Source: Field Data, September, 2021.

Table 2. Annual household income after joining the beef farming project.

Range of Income USD	Respondents (N=174)	
	Frequency	Percentage
1500 - 2000	80	45.7
2000 - 2500	56	32
2500 - 3000	38	22.3
Total	174	100

Source: Field Data, September, 2021.

Table 1 shows that before joining the beef farming project, 44.2% of farmers earned annual incomes between US \$ 500 and US \$ 1000; 37.8% earned between US \$ 1000 and US \$ 2000 while 18% earned between US \$ 2000 and US \$ 2500. As shown on Table 2, annual household incomes increased after joining the beef farming project about 45.7% of farmers earning between US \$ 1500 and US \$ 2000. About 32% earned between US \$ 2000 and US \$ 2500 while 22.3% received between US \$ 2500 and US \$ 3000. Mean annual incomes were

US \$ 1302 and US \$ 2129 before and after joining the beef farming project respectively, which is an increment of 63.5%. The beef farming project also improved household incomes for the marginalised groups in Chipinge South. It came out during the interviews that disabled farmers who participated in the project had a better source of income than those who did not participate. It also emerged from the FGDs that women who partook in the beef farming project had better incomes than those who did not participate.

Table 3 shows that income generated from beef farming is used for a number of purposes.

About half (51.8%) of the income from sales was used for purchasing staple food. The other uses included purchasing the agricultural inputs (11.9%), paying for school fees (10.6%) and purchasing groceries (11%). Income from beef sales was

not generally used for expenses such as clothing (2.7%). Most of the beef farmers focused more on beef than other agricultural practices such as crop farming; thus, it was unsurprising that the bulk of their income was used for purchasing the staple cereals. Other uses (12%) included transport, funeral costs and entertainment.

Table 3. Uses of income from beef sales.

Use of Income	Respondents (N=174)	
	Frequency	Percentage
Buying staple food	90	51.8
Buying Agricultural inputs	21	11.9
Buying non-staple food/groceries	19	11
Paying School fees	18	10.6
Clothing	5	2.7
Other Expenses	21	12
Total	174	100

Source: Field Data, September, 2021.

### Enhancing Assets Position of Beef Farming Households

The study also looked at household assets to assess whether or not beef farming had any impact on the livelihoods of the beef farmers. The research established that a number of beef farmers managed to convert their stock wealth into monetary value and to transform this value into social investment. Results show that beef farming improved the asset position of beef farming households in Chipinge South Rural District. Fixed inputs in beef farming include beef cattle and the beef cattle sheds/kraals, as well as such durable inputs as tools and water barrels.

Farmers were asked to compare their economic status before and after the beef farming project intervention. Results in Table 4 show that a large number (96%) of the farmers who responded acknowledged that their economic status had improved as a result of participating in the beef cattle farming project and this was reflected through their ability to purchase various household goods and assets. Conversely, 2.8% of the respondents revealed that their economic status had not changed, while 1.2% reported that their economic status had decreased.

Table 4. Economic status of famers before and after joining beef farming.

Economic Status	Respondents (N=174)	
	Frequency	Percentage
Increased	167	96
Remained the same	5	2.8
Decreased	2	1.2
Total	174	100

Source: Field Data, September 2021.

Most of the respondents revealed that they sold their beef cattle to acquire universally acceptable and prestigious household assets such as television sets, motor bikes, radios, furniture, solar panels, bicycles and vehicles, which they did not have before joining the beef farming project. Out of the total 174 households, 90 percent had beef cattle housing/kraals, 77 percent bought radios, 67 percent had television sets, 63 percent had bicycles, 61 percent had motor bikes, 58 percent had solar panels, whereas 51 percent had new furniture from beef cattle sales. The households that bought vehicles were 41 percent, while those that constructed dip tanks were 15 percent. It was observed during field visits that the majority of beef farmers bought pick-ups and canters as utility vehicles. These vehicles were believed to be more reliable for use on the rough plain and sandy soils in the Chipinge South area. The research also showed that the demand and need to build better houses had equally spread to Chipinge South with 60 percent of the households having built modern iron-roofed

houses while 29 percent of the respondents fenced their farms. These assets are usually valuable and tradable in the market to mitigate crises faced by households. For the beef farmers in Chipinge South, possession of the assets was in one way or another related to the possession of animals. Just like cattle, these assets are social status symbols. Table 5 shows selected household assets that were bought using income generated from beef farming.

These statistics from Table 5 reflect improvement in life styles and information dissemination and reception.

Fifty two percent of the respondents revealed that beef farming enabled them to access Digital Satellite Television in their homes. The study also found that households that participated in the beef farming project had better houses and better-quality household assets compared to those that did not partake in the project. For example, it was observed during field visits that the majority of households that did not participate in the project were still living in pole and dagga houses and their toilets were of poorer quality.

Table 5. Assets purchased using income derived from beef farming.

Items Owned by Household	Percentage of Farmers Owning the Specific Assets (N=174)
Beef cattle housing/kraals	90
Radios	77
Television sets (TV)	67
Bicycles	63
Motor bikes	61
Solar panels	58
Furniture	51
Vehicles	41
Dip Tanks	15

Source: Field Data, September 2021.

**Job Creation**

Beef farming offered full-time employment to families, as shown by the results of the survey. The project created employment both at the farm level and at the scheme area level. Eighty percent of the registered farm owners worked full-time on the farm. Seventy three percent of the respondents had full-time workers and employed a total of 134 workers. The average monthly payment for labour was US \$45 plus food and accommodation. These workers were mainly employed for cattle keeping and crop production. Thirty percent (30%)

of the respondents indicated that they sometimes hired temporary casual workers during the cropping season for ploughing, planting, weeding and harvesting. Almost all farmers relied heavily on the use of family labour (Table 6). Division of labour within the household was not well defined, although attending the meeting and attending courses was normally done by the father or mother. These normally interchanged as head of household for such purposes depending on availability. Table 6 suggests that beef farming offered full-time employment to all members of the household.

Table 6. Percentage responses to division of labour in the household to various beef farming activities for the sample (N=174).

Duties	Cattle Herding	Cattle Dipping	At. Meeting	At. Course	Cattle Slaughter	Treat Cattle
Father	6	8	60	52	44	46
Mother	13	15	30	40	-	14
Children	15	21	7	8	6	6
Workers	66	56	3	-	50	6
CLDT/Vet	-	-	-	-	-	28

Source: Field Data, September 2021.

Sixty six percent of the households said cattle herding was mainly done by workers. Fifty six percent of the households said the dipping of cattle was mainly done by workers. Treating of sick cattle was mostly done by the father, followed by CLDT or veterinary specialist and the mother, respectively. The hierarchical order reflects the importance to which community attach beef cattle.

**Nutrition and Food Security Benefits**

Smallholder beef farming had a direct positive outcome on food security in the area. Farmers were asked to compare their food security status before and after the beef farming project

intervention. Results in Table 7 demonstrate that a big number (95%) of the farmers had their food security status improved as a result of participating in the beef cattle farming project. About 3 % of the respondents indicated that their food security status had not changed while 2% reported that their food security status had decreased. Those farmers whose food security status improved indicated that the project made them more food secured throughout the year compared to the situation before the project intervention. The farmers which were not able to feed themselves throughout the year revealed that they lost a large number of cattle during the 2007/2008 drought and were facing challenges in managing their farms.

Table 7. Food security status of farmers before and after joining beef farming.

Food Security Status	Respondents (N=174)	
	Frequency	Percentage
Increased	165	95
Remained the same	5	3
Decreased	3	2
Total	174	100

Source: Field Data, September 2021.

Results in Table 8 demonstrate that farmers relied more on income from beef sales (80.7%) to purchase food stuffs during critical food shortage. The contribution from crop production,

off-farm income and other sources of income was 6.3 %, 4 % and 3.6%, respectively. About 5.4 % of the respondents indicated that they did not face critical food shortage.

Table 8. Sources of money to buy food stuffs during critical food shortage.

Source of Income	Respondents (N=174)	
	Frequency	Percentage
From beef sales	141	80.7
From crop production	11	6.3
Did not face critical food shortage	9	5.4
Off farm income	7	4
Others	6	3.6
Total	174	100

Source: Field Data, September 2021.

Survey results also showed that there was a general increase in beef consumption (66.7%) across all farmer groups visited. Beef offers a cheap protein source to the farmers. The increased beef consumption is therefore assumed to improve nutritional status of the household. Some 24.5% of the farmers

indicated that their beef consumption did not change as a result of the Chipinge South project, while 8.8% indicated a decrease (Figure 1). The decrease could be attributable to the fact that beef cattle are not merely for beef consumption but for other purposes alluded to above such as a form of banking.

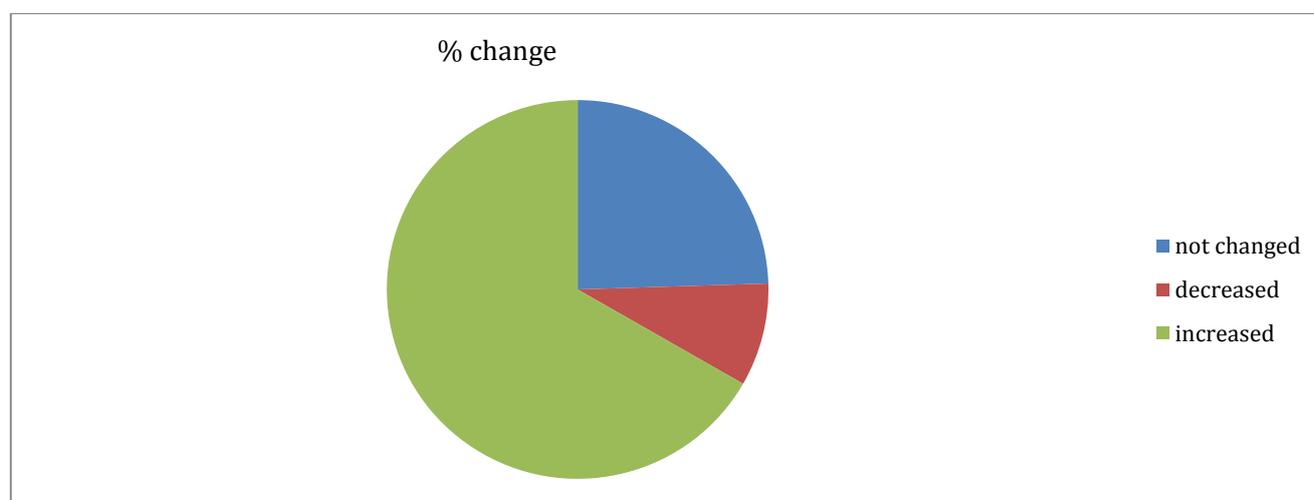


Figure 1. Percentage change in beef consumption at household level (Source: Field Data, September 2021).

Increases in beef consumption were mainly attributed to increase in production which is directly attributed to the project.

#### **Information and Communication Technology**

The project improved the farmers' access to information and communication technology. Mobile technology is important to beef farming as it has the potential to transform smallholders' access to critical and timely information. Through improved communication, farmers can exchange up to date information on beef marketing, weather patterns, pests and diseases, among other issues affecting beef farming projects.

All the respondents were asked whether they owned a smart cell phone before joining the project and for what purposes they used it. The majority of the farmers (87 %) indicated that they had no smart cell phones and only managed to buy the phones after joining the project. About 9 percent of the farmers stated that they had smart cell phones before joining the project, while the remaining 4 % were yet to buy smart cell phones. The farmers who managed to purchase smartphones said that they were now able to access *WhatsApp* and *Facebook* platforms which they could not do before.

The possession of smart cell phones is one area in which the beef farmers in Chipinge South had a comparative advantage compared to households that did not participate in the project.

For example, it was noted through observation that a number of non- beef producing farmers were still relying on old model Nokia mobile phones, which do not have access to *WhatsApp* and other social media platforms. This observation was also confirmed during Key Informant Interviews held in the area.

It was also noted that apart from using their smart cell phones for communicating social messages with their loved ones, the Chipinge South farmers have taken full advantage of this revolution in information technology to improve their beef farming operations. Most of the research participants divulged that they had a *WhatsApp Group* where they shared valuable information on beef farming. The farmers also indicated that they were using their mobile phones for various beef commercial purposes meant to improve the marketing of their beef produce. The research also noted that there was a small number of respondents (12 %) that managed to buy laptops for their school children using proceeds from beef sales.

#### **Human Capital Development and Education**

The project enhanced the quality of education for the children of beef producing households. Survey results demonstrated that the majority of farmers (80 %) relied on income from beef sales to pay school fees for their children. The study also established that about 59 percent of the respondents managed to send their kids to boarding schools using cash from the

project, while 35 percent funded university education for their children.

The project also offered a comprehensive training programme in all areas related to beef production and crop production. This training has equipped the farmers with the relevant knowledge and skills required for them to farm successfully. All the households interviewed acknowledged that they were trained several times on the use of new/improved technologies by CLDT extension staff and management. The trainings covered a number of subjects including record keeping, calf rearing, nutrition management, fodder production, beef management and animal health, among others.

### **Limits to Livelihood Outcomes and Sustainability**

#### ***Access to Livelihood Resources***

**Financial Capital:** The financial form of capital involves the cash and loans secured by farmers to improve their farming enterprises. This form of capital also includes savings and other forms of income that farmers obtain from a diversity of livelihood options at their disposal. This study looked at different sources of financial capital obtainable through credit-lending institutions in Chipinge South rural community. The results of this research show that most of the beef farm households in Chipinge South had inadequate access to credit lines from financial institutions and they in turn, had inadequate financial capacity to meet their pressing cash requirements and to secure other vital beef farming inputs like animal feeds and chemicals. Owing to its short supply nature, credit was usually very costly when availed. This finding is in line with Scoones (2007)'s observation that in a number of less developed countries, "smallholder farmers face many challenges of land tenure, poor credit facility policies and inefficient producer organisations". These factors weaken the farmers' capacity and eligibility to acquire loans from credit lending institutions. In Chipinge South Rural District, smallholder beef farmers have not been immune to these financial challenges. Many of the farmers in Chipinge South did not have collateral security to access credit facilities from reputable finance institutions.

**Physical Capital:** Physical capital is used to refer to fixed assets like machines, technology, infrastructure and communication equipment. Other forms of infrastructure like transport, energy, water and shelter are also part of physical capital. These components affect the livelihood options of rural households in many ways. In Chipinge South, for example, poor road networks restricted beef farmers from accessing better beef markets. In addition, the unavailability of dams for water storage, particularly against a backdrop of climate change, compromised the quality of beef produced by farmers (DFID, 2000; Scoones, 2002). There was also a general inadequate provision of beef cattle infrastructure such as proper sheds and barns, as the majority of the farmers relied on their meagre resources. This, in turn, has forced farmers to rely on poor infrastructure, thereby affecting the quality of the beef they produced as well as their capacity to market their produce.

**Natural Capital:** The natural form of capital encompasses the piece of land that is provided to farmers by the government

alongside other resources like water, biodiversity and forest. For the smallholder beef farmers in Chipinge South Rural District, land is the most critical form of natural capital. The study observed that farmers have huge tracts of land for grazing. However, the availability of natural capital, that is, the piece of land, has not been complemented with other forms of capitals to improve sustainable rural livelihoods. As a result, the beef farmers have not produced to the optimum capacity. Moreover, the study also noted that farmers were grazing their livestock on these pieces of land in an unsustainable manner. Most of these areas were over utilized and exposed to erosion, thereby leading to siltation of rivers which are a critical natural water source.

**Social Capital:** The DFID (2000) used the term social capital to refer to personal connections and networks, the assurance of trust and communal support that beef cattle farmers receive from other farmers and various social engagements within their networks. It entails issues of trust, shared values, mutual understanding and socially held views and knowledge that enable the easy coordination of projects and /or an economic activity (DFID, 2000). Ellis (2000) noted that the issue of mutual trust amongst major stakeholders is critical to the success of smallholder beef farming projects as it also affect the sustainability of such projects. Social capital is regarded as "the supremacy of all capitals" and it is presumed that one can "easily attain all the other forms of capital if he/she is socially connected" (Ellis, 2000). Other researches have also demonstrated the very close link that exists between the social form of capital and productivity (Chawatama et al., 2005; Musoro, 2016; Janjazi, 2017).

This study found that there were many challenges that restricted social connections in Chipinge South. Farmer conflicts were identified as one of the major problems affecting social connections. Farmer committees which were supposed to spearhead the process of social connectivity have been handicapped by power skirmishes. Most of these power skirmishes appeared to be predicated on ethnic diversity. The farmers were also poorly organised and those committees elected to office to represent farmers have been accused of pursuing their own interest and dividing the farmers along ethnic lines.

#### **Vulnerability Context**

According to the SLF vulnerability is one critical aspect that rural households are struggling with. The SLF views rural households as having access to a number of livelihood options, including farming (Scoones, 2007). The SLF pinpoints that both endogenic and exogenic factors have an influence on rural livelihoods and they all have a bearing on vulnerability. The effect of climate change, particularly the incessant drought occurrences have had a far-reaching impact on Chipinge South beef farmers. A number of respondents confirmed during the study that drought was a natural phenomenon in the area. However, majority of the farmers in the area have not learnt either to live with or to develop adequate ways of managing this natural phenomenon (drought). Indications from the study are that every drought incidence was regarded as a new natural circumstance. Some of these perceptions emanated from social interpretations of weather and disasters. Most of

the farmers panicked and showed desperation in their quest for drought mitigation strategies. In most cases, the course of action adopted by farmers depended on resources at the disposal of each individual farmer. Some farmers did absolutely nothing during drought occurrences. This often led to the deaths of large numbers of beef cattle as majority of the farmers did not afford supplementary feeds.

Overgrazing was also threatening the natural ecosystem on the scheme. The scheme did not have a clear policy on the management and utilization of the open lands. The pressure being exerted on grazing land often accelerates the harm associated with droughts in the area. In response, the majority of the beef farmers have been forced by circumstances to sell their animals prematurely in order to decrease pressure on the grazing lands. This means that the farmers' animals end up fetching lower prices at the market, thereby negatively affecting the financial position of farm households and that of the community at large.

### CONCLUSIONS AND RECOMMENDATIONS

The Chipinge South beef farming project contributed significantly to household development in the area. The project improved household annual incomes for beef farmers which translated into improved household assets, better education, adoption of new technology, improved food security and nutrition, among others. A good number of farmers managed to build decent houses, which they could not afford before taking up beef farming. The project also created employment opportunities for the marginalised members of the Chipinge South community, particularly women, youths and the disabled. While the beef farming project yielded notable benefits to rural households in Chipinge South, the project's ability to foster sustainable rural livelihoods in the long run was negatively affected by, among other factors, limited access to key livelihood capitals. Thus, the beef farming project still has a long way to go in eradicating absolute rural poverty in the Chipinge South Rural community. In this light, it is recommended that the responsible authorities in Chipinge South Rural District urgently address the challenge of access to livelihood capitals threatening the sustainability of the project. The initiative would be handy in promoting long-term investment in the beef farming sector in the study area. This study also strongly recommends that the government come up with a clear policy on drought management and utilization of the open lands. The study recommends the construction of dams as a lasting solution to the threat of drought.

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