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Towards Improving Livelihood of Smallholder Livestock Farmers Under Communal Farming

Kutu Lesetja Wesley^{1*}, Zwane Elliot Mahlengule² and Letsoalo Sebatana Simon³

¹Department of Agriculture Economics and Extension, North-West University, South Africa; ²Centre for Rural Community Empowerment, School of Agriculture and Environmental Sciences, University of Limpopo, South Africa; ³School of Agriculture Sciences, North-West University, South Africa.

*Corresponding author: Kutu Lesetja Wesley; E-mail: K200621176@gmail.com

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ABSTRACT

This review examines the various opportunities and challenges faced by smallholder livestock farmers on communal land, highlighting the multiple roles of livestock as economic, social, cultural, and environmental assets. Despite playing a critical role in rural livelihoods, smallholder livestock farmers encounter various challenges, such as limited access to extension services, livestock theft, movement restrictions, and interference from traditional authorities. This paper draws on a literature review and combines findings from twenty-nine articles, twenty-eight reports, and eight university repository theses published between 2000 and 2024. Key findings show that livestock farming remains crucial for livelihoods, supporting food security, income generation, and socio-economic well-being. The conclusion emphasizes the importance of promoting sustainable livelihood strategies to tackle the specific challenges encountered by smallholder livestock farmers. Future research should investigate the lasting impacts of extension services and community-based natural resource management on household income, food security, and livestock productivity.

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Introduction and Background

The livelihood of smallholder livestock farmers within communal settings presents distinct set of challenges, especially those relating to the management of livestock. In many developing regions, agriculture extension services form the pillar of rural livelihood, with communal farming systems playing a key role in supporting local communities (Jona and Nghixulifwa, 2018). In these systems, livestock fulfil multiple essential roles not merely sources food but contribute to economic stability, social unity, and environmental management (Amejo, 2024 and Herrero *et al.*, 2013). Enhancing the livelihoods of smallholder livestock farmers is vital for poverty reduction, food security improvement, and rural economic development.

However, despite some recent success in improving livestock systems, smallholder livestock producers within communal areas exhibit heterogeneity in farming practices and settings, necessitating customized solutions instead of one-size-fits-all approaches (Tefera *et al.*, 2021). Research in South Africa has shown variations in livestock productivity among different districts due to varying production conditions. This highlights the necessity for region-specific strategies to enhance efficiency and productivity (Nyam *et al.*, 2020; Banda and Tanganyika, 2021). Their contribution extends beyond food production; they are essential for ensuring global food security and significantly support the socio-economic stability of local and national economies (Dixon & Richards, 2016). Smallholder livestock farmers particularly those in communal settings, often face challenges that limit productivity, profitability, and sustainability (Dhillon and Moncur, 2023 & Gwiriri *et al.*, 2021). Therefore, communal livestock farming systems play a significant role in promoting livelihoods in underprivileged parts of developing countries worldwide (Donadeu *et al.*, 2019; Bessell *et al.*, 2018 and Becker, 2015). Therefore, for this study communal farming refers to agricultural livestock practice where grazing veld and resources are collectively owned and managed by group of farmers, rather than by individual (FAO, 2018),

Dynamic interactions of social, economic, and environmental factors influence communal livestock farming, shaping how farmers develop their livelihood strategies. This farming system is characterized by farmers owning few animals per household (Negassa *et al.*, 2017 and Mahlobo, 2016). They rely on traditional production techniques (Katikati and Fourie, 2019), and only a few of them market their animal products. Livestock farmers within this system rely on the family economy and provide social and economic relief to individual households living below the poverty line (Nyambo *et al.*, 2019 and Mmbengwa, 2016). The low household income is the primary reason smallholders find themselves in financial hardship, with livestock farming being the main source of revenue for most households. Despite smallholder livestock farmers owning a substantial portion of national livestock herd, they face multifaced challenges. Livestock remains a key economic and social asset, but its contribution to sustainable livelihood is undermined by systematic barriers. Support initiatives for smallholder livestock farmers are hindered when policy parameters do not match the operational environment of the farmers. These leaves smallholder livestock farmers under communal setting trapped in poverty with little option to improve their family livelihood.

Therefore, a thorough understanding of the existing communal management strategies and socioeconomic context is essential for implementing new livelihood goals. The important of smallholder livestock farming under communal farming is highlighted by its potential to promote rural livelihoods and support food security and sustainable agriculture development. Communal farmers do not immediately transition into profit-oriented individuals seeking to optimize profits through market transactions (Khepe *et al.*, 2020 and Sugimura, 2007). Targeted agriculture extension can enhance sustainable food production and improve livelihoods in such settings (Ndoro *et al.*, 2014).

Purpose of the study

Smallholder livestock farmers play a crucial role in ensuring food security, supporting rural livelihoods, and maintaining sustainable agricultural systems. This is especially important in community farming settings in developing areas. However, these farmers often face persistent challenges such as livestock theft, impacts of climate change and bush encroachment, restrictions on animal movement and local Traditional Authority Interference. These challenges affect production, income stability, and resilience. The study explores the challenges and potential advantages experienced by smallholder livestock farmers operating within a community land system while pursuing their livelihoods. By focusing on enhancing livelihoods through tailored innovations, effective information sharing, and active community involvement, agricultural extension services can significantly aid smallholder livestock farmers who are farming under communal land systems. This document offers practical strategies and approaches to enhance the livelihoods of smallholder livestock farmers who are operating within communal systems. The document aims to enrich the knowledge base to inform policies and practices that are aimed at improving communal agricultural systems and fostering resilient and prosperous livelihoods in rural communities.

Conceptual Reflections

Livestock farming in communal contexts is shaped by dynamic interplay of numerous factors, which significantly influence the livelihood strategies used by farming community. At the core of discussion is the comprehensive conceptual framework, which provide systematic approach that explore interactive factors that influence the communal farming environment. The conceptual framework that supports sustainable livelihood approaches (SLA) can significantly contribute to improving smallholder livestock farming. Farmers' ability to adapt to challenges depends on factors like the availability of resources, livelihood assets, and support from agricultural extension services (see Figure 1 for more details). The framework in Figure 1 shows key factors affecting communal farmers' livelihood, how these factors interact, and strategies for sustainable outcomes.

Internal and external pressures on communal livestock farmers show a significant interaction of factors shaping their livelihood. Disputes over resources, fuelled by competition between traditional authorities and farmers, severely impact both individual and communal prosperity. Therefore, the addition of external stressors to communal farmers requires adaptive responses that address all challenges within communal land. Moreover, Bush encroachment and livestock theft add another layer of insecurity, leading farmers to invest in protective measures. All these factors result in sub-optimal usage of pooling resources and impeding of effective collaboration which affects productivity outcome.

Communal farming systems are based on the foundation of shared accountability and collective management of resources. Resource pooling enhance the adaptive strategies of farmers. When farmers collaborate in managing resources, they can use underutilized assets, which helps them build resilience in times of scarcity. The adaptability of communal livestock farmers is significantly influenced by various livelihood assets. The livelihoods assets, including natural, human, social, financial, and physical capitals work collectively to address farmers challenges. These assets present a key role in shaping farmers ability to implement effective adaptive strategies. Agriculture extension service is essential in resource allocation, facilitate knowledge exchange and promotion of adaptive strategies which have a significant impact on the livelihood of communal farmers. Research by Goni *et al.*, (2018) supports this, highlighting that improved training is crucial for boosting livestock production and economic growth in communal farming. Therefore, agriculture extension services offer effective ways to enhance resilience.

Adaptive strategies promoted by agriculture extension services help mitigate the negative impacts of insufficient support. As a result, these strategies rooted in collaboration and resource pooling becomes essential for mechanism for strengthening resilience. The availability and effectiveness of agricultural extension services, along with aligned adaptive strategies, lead to improved livelihood outcomes for smallholder farmers. Feedback mechanisms like farmers' days and meetings are crucial for facilitating ongoing knowledge sharing, refining

adaptive strategies, and bolstering communal resilience. This emphasizes the importance of effective communication in enabling that communal livestock farmers to take advantage of available resources and strategies. This mechanism not only shares information but also fosters collaborative problem-solving, allowing farmers to benefit from each other's experiences.

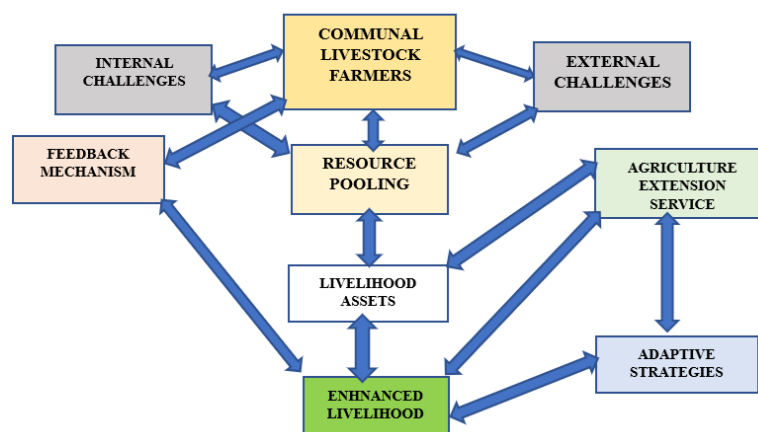


Figure 1. Comprehensive Conceptual framework for livelihood strategies in communal livestock farming
Source: Authors own work

Review Methodology

This paper is based on literature review that examines the livelihoods of smallholder livestock farmers in communal settings. This was done by using diverse sources to analyse and address important difficulties encountered by smallholder livestock farmers under community farming. The study database comprises twenty-nine peer-reviewed journals, twenty-eight reports, and 08 university repository theses, which were used for this research. All the sources used in this study were published between the years 2000 and 2024. Keywords related to livestock livelihood were used to search for all challenges within the communal farming system. All eligible sources used in review were identified by systematically searching the major electronic database such as google scholar, SCiELO, Scopus, Science direct, AGRICOLA and SpringerLink. The primary search engine provided free links to full-text articles. Research websites like ResearchGate were used, enabling direct requests for full-text articles or papers from the author. These documents and publications were considered valuable for understanding the livelihood of smallholder livestock farmers in a communal system. It is important to note that no specific study area was chosen for this article.

Finding and Discussion

Reflection of smallholder livestock farmers within communal system

Smallholder livestock farmers operating within a communal system possess unique characteristics shaped by socio-economic factors, the environment, accessibility to resources, and farming practices. This is because their unique characteristics, influenced by socio-economic factors, the environment, resources accessibility, and farming practices, contribute to sustainable rural development (Hemme *et al.*, 2010). Livestock owners in rural community use this type of natural rangeland grazing to maximize output (Mapiye *et al.*, 2020). This farming system involves a shared resource pool, a dipping tank, drinking water holes, and breeding bulls that are accessible to all livestock farmers. This dual purpose significantly influences livestock management, leading to

decisions often being influenced by cultural imperatives rather than market efficiency or production factors. In some cases, prioritizing herd quantity over quality leads to low off-take rates and inefficiencies within cattle value chains, perpetuating this cycle.

The local traditional African Chief controls grazing rights, and the lack of entry rights diminishes the economic value of common grazing, leading to overstocking and a lack of accountability (Scholtz and Bester, 2009). The territory was formerly known as Tribal Trust Lands. The farms within the Tribal Trust Lands are mostly traditionally unfenced (Mudzielwana, 2015). Typically, livestock in the area are released in the morning and guided to the open grazing veld for the day. They are then returned home to be kraaled over the night (Monkwe *et al.*, 2023). The high number of bulls grazing on the communal land poses a challenge to improving herd productivity, as farmers are hesitant to sell these bulls instead of opting for the highest quality bulls in the community (Nkosi, 2017). Generally, most of the animal within communal setup are simply subjected to natural selection where only the fittest survive. During winter month, animals are usually left to fend for themselves without supplementation of their feeds or control of internal and external parasites.

Most farmers in the communal system, who are elderly, engage in livestock farming. They have cattle as a means of livelihood rather than a business, and their primary source of income comes from non-agricultural activities. Furthermore, they are illiterate and unfortunately the current livestock farming system under communal land is dynamic and require someone who is update with developments and change. The prominent level of illiterate among smallholder farmers sometimes makes it difficult for them to capture all ideas presented to them (Ajala *et al.*, 2013). Moreover, even after communicating the ideas, some of them cannot successively translate the ideas practice. According to Chikazunga and Paradza (2012), there are no solid support systems available for the provision of previously disadvantaged farmers, limiting their access to the countless opportunities offered by the government (Anyike, 2011). The production system is irrelevant especially regarding formal agriculture output (Beyene *et al.*, 2014). The insignificant impact of communal smallholders could be attributed to their limited contribution to small livestock sales in the market.

Role Agriculture extension service on the livelihood of smallholder livestock farmers under communal farming

Agriculture extension services are crucial for promoting sustainable farming practices among individuals who own a small number of livestock in communal systems. Effective extension approaches, like on-site visits by agricultural experts, significantly enhance farmers' ability to manage livestock and adapt to changing conditions. However, farmers continue to face challenges in accessing farming resources (Loki and Mdoda, 2023; Manyakanyaka *et al.*, 2022 and Mapiye *et al.*, 2021). Access to agricultural support services is vital for equipping farmers with the information, technology, and training they need to enhance their livelihoods and foster agricultural development. In developing countries, individuals with few livestock rely heavily on agricultural extension systems as their primary and most comprehensive source of knowledge (Pousga *et al.*, 2022 and Raidimi and Kabiti, 2013). Thus, access to extension services is crucial for fostering sustainable livelihoods and self-reliance among small-scale livestock owners in communal farming systems. The primary strategies offered by extension services, as shown in Figure 2, comprise focus groups, climate change initiatives, training programs, farming diversification, and livestock management.

One of the key functions of agricultural extension services is to promote the formation of focus groups among communal livestock farmers. These groups provide opportunities for farmers to share experiences, discuss problems, and collectively develop solutions to common livestock management issues. The establishment of livestock focus groups strengthens collaboration among farmers and increases the platform for requesting improved agriculture support and resource from extension service. According to Stevens & Terblanche (2004) successful farmer groups are prerequisite for fast agriculture development. Strategic use of focus groups in agricultural extension services improves the understanding of the complex interactions within communal farming systems. It also allows for more relevant and sustainable actions that are based on farmers' needs and

aspirations. Focus groups are a critical tool for understanding social learning processes among farmers, particularly where access to extension services and resources is highly skewed (Leta *et al.*, 2018). Integrating focus groups with other participatory extension methods such as community-based extension agents enhance functional group approaches and establishing organizations in communal farming communities. The extension agents are not only disseminating information but building farmers' ability to organize, voice their concerns, and sustain gains over time. In community group discussions, livestock farmers can reflect on their experiences, question existing assumptions, and co-create knowledge and strategies for improving their livelihoods.

Climate change significantly affects livestock management practices, necessitating adaptations by smallholder farmers. Agriculture extension services play a vital role in educating communal farmers about climate-related risks and adaptive measures, enabling them to implement coping strategies effectively. Extension officers help farmers withstand climate variability and reduce vulnerability to environmental shocks by sharing information on climate adaptation strategies. This aligns with views by Okwama *et al.*, (2022) highlighting that access to extension service promote adoption of climate-resilience technologies resulting in improved livelihood.

The training programs offered by agriculture extension services are crucial in developing farmers' knowledge and skills in areas such as sustainable farming practices and livestock management. These seminars address multiple various aspects of livestock management and equipping farmers with the essential tool needed to enhance their productivity. According to Bhatti *et al.*, (2021), Training programs, such as "Train & Visit" farmers approach, facilitate the dissemination of best practice and promote adoption of improved farm management techniques, which are essential for increasing income and food security.

Promoting diversification of farming practices through agriculture extension services significantly enhances food security and income stability for communal farmers. However, livestock often receives less attention than crop production in extension services, underscoring the need for adopting more comprehensive and integrated approaches to address this imbalance. By encouraging farmers to combine livestock and crop production, they can create a stronger system that protects against climate-related challenges like soil erosion and pest outbreaks. One of the primary objectives of agricultural extension services is to provide comprehensive support and guidance in livestock management, which is essential for the sustainability and productivity of smallholder livestock farmers.

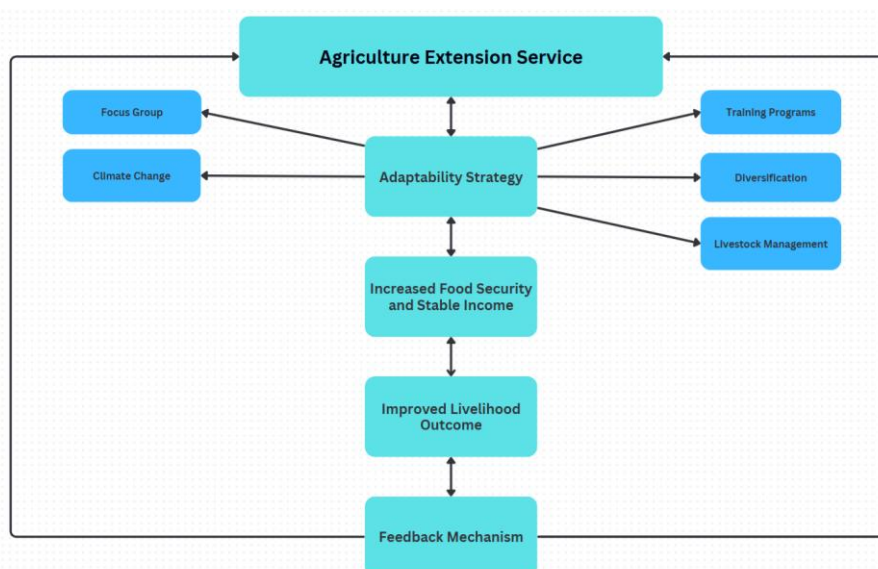


Figure 2. Flowchart depicting agriculture extension role in promoting adaptive strategies.

Source: Authors own work

Livestock management is crucial for smallholder livestock farmers in communal systems. It boosts productivity, enhances sustainability and resilience, and creates opportunities for economic and social advancement in rural areas. Furthermore, livestock extension services play a crucial role in sustainable grazing management by preventing overgrazing and land degradation in communal grazing lands, contributing to the preservation of natural resources and ecosystem health. This aligns with the findings of Slayi *et al.*, (2024), who identified land management in communal systems as a critical factor influencing productivity, sustainability, and resilience. Additionally, it can serve as a tool to empower rural communities to mitigate the current challenges and benefit from the current economic and social opportunities.

Effective assessment and delivery of agriculture extension services are crucial for the successful implementation of these adaptive strategies. Hence, the role of agricultural extension services in improving the livelihoods of smallholder farmers lies in the promotion of adaptive strategies. Promoting sustainable practices, enhancing livestock management techniques, and introducing resource-efficient innovations can strengthen communities' adaptive capacity, enabling them to withstand various vulnerabilities, including those related to climate variability, economic fluctuations, and resource limitations. Nevertheless, the strong bond between communal livestock farmers and extension officers is vital for overcoming challenges arising from weak connections that hinder growth and sustainability. Adopting a participatory approach enables extension officers to design their services effectively, fostering stronger relationships and trust.

The exploration of agriculture extension services highlights a key role in strengthening the resilience of smallholder livestock farmers and improving food security within communal farming system. These services are not just supplementary components but also assist livestock farmers to adapt to multifaceted challenges. Prioritizing the specific needs of farmers allows agriculture extension services to strengthen their capacity in managing environmental challenges and building long-term resilience effectively.

Towards the livelihood recognition within communal farming system: Multifunctionality of livestock.

Livestock is a crucial asset in communal farming systems, providing benefits like increased crop yields, reduced soil erosion, and community cohesion (as seen in Figure 3). This fosters resilience, sustainability, and an improved quality of life. The complex roles played by livestock within communal farming systems extend to economic assets including social, cultural, and environmental aspects that collectively shape rural livelihoods (Leah *et al.*, 2023). In addition, recognising the influence of livestock in the developed and developing nations is important in acknowledging its diverse roles in livelihood, economic development, and environment (Herrero *et al.*, 2012). Moreover, Moyo *et al.*, (2010) acknowledged that the rapid growth of the livestock sector is being driven by demographic shift and increasing demand, highlighting its significance in enhancing food security and poverty alleviation in communal settings.

Therefore, in a communal setting, recognizing livelihood acknowledges the various roles livestock contribute to in strengthening community resilience and promoting sustainability. By recognizing this multifaceted contribution, agriculture extension officers can develop more effective strategies for managing resources and integrating them into broader development frameworks. In these systems, collective decision-making and shared responsibilities facilitate a framework that supports the well-being of both the community and the ecosystem, where resources are managed collaboratively. Communal farming systems stand in contrast to commercial farming frameworks, which focus on individual ownership and the pursuit of maximum profit.

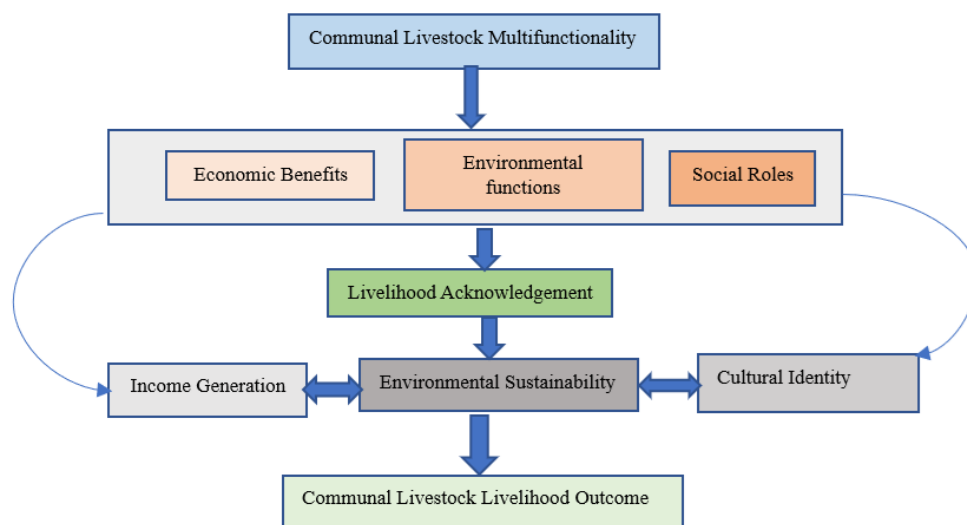


Figure 3. Integrated Livestock Multifunctionality and Livelihood Acknowledgement

Source: Authors own work

Turk (2014) highlights that this farming system holds noteworthy features such as environmental benefits, sociocultural aspects, and income generation opportunities. Livestock's importance in these frameworks goes beyond agricultural production; it also provides social status, draft power, and supports nutrient cycling, reinforcing its multifunctionality. Hence, the reasons for keeping livestock differ among communal farming systems. To enhance the contribution of livestock to the livelihood of developing communities, it is essential to deeply understand the diverse and complex role livestock plays. The following sections elaborate on the key aspects of this multifunctionality.

Economic advantage of livestock farmers under communal farming settings

Livestock asset accumulation, as depicted in Table 1, helps families use these assets as collateral to access financial services. One of the most apparent economic functions of livestock is income generation. During challenging times, farmers sell animals to generate immediate income to address food insecurity. Communal livestock farming creates job opportunities for a range of roles, from animal care experts to daily task workers. Yet, job creation in livestock farming is influenced by factors like technology and access to credit. By acknowledging livestock as assets, as shown in Table 1, financial institutions can use them as collateral for loans, allowing farmers to enhance agricultural practices. Producing and consuming livestock products lessens reliance on external markets, fostering self-sufficiency.

Communal livestock farming significantly contributes to local economies by establishing market networks that facilitate livestock sales. These market interactions help boost economic activity in local areas, benefiting markets, feed suppliers, and butcheries through the financial flow from livestock transactions. Collectively managing livestock strengthens the bargaining power of communal farmers, resulting in better market prices and shared resources. Recognizing these economic benefits will shape policymaking and development strategies to support communal farmers in reaching their full potential.

Table 4. Economic function and Livelihood Outcome

Economic function	Livelihood outcome	Description
Asset accumulation	Wealth investment	Livestock as a form of savings and collateral within financial systems
Income generation	Cash savings	Sales of livestock resulting in direct income
Employment Creation	Job opportunity for local community	Herding of livestock as a form of job creation
Access to credit	Financial inclusion	Security for accessing loans
Food Production	Nutritional security	Home slaughtering and selling extra meat to local community

Source: Authors own work

Environment Service within communal farming system

Integrating ecological practices with communal farmers' livelihood highlights how livestock interact with their environment. Livestock in a communal farming system play a crucial role in maintaining the environment, ensuring ecological balance, and promoting sustainability. Practices like rotational grazing, utilizing traditional ecological knowledge, and integrating livestock management with conservation initiatives can improve soil health, biodiversity, and contribute to broader climate mitigation. When traditional farming methods are mixed with modern ideas, communal farming can become a central part of boosting agricultural productivity and taking care of the environment. This highlights the significance of customized assistance and allocation of resources. Supporting farmers in communal farming to improve environmental practices also aids in achieving their economic objectives. Modern and effective extension services play a vital role in sharing knowledge and best practices to empower farmers.

Social Role of livestock farmers under communal farming

Owning livestock can influence individual social status within a communal context, as shown in figure 5. Livestock ownership is associated with notions of power and respect. Those farmers with larger herds enjoy much social status among their peers. This form of social capital reinforces communal bonds, as livestock act as point of focus for collective farming activities. This aligns with Swanepoel *et al.*, (2010) remarks, which note that livestock ownership signifies social standing and cultural identity, fostering social cohesiveness. Through collaborative agriculture practice, such as breeding and livestock husbandry, farmers participate in collective activities that promote a sense of social cohesion and mutual support. This engagement strengthens community ties, as most farmers rely on social network, not only for emotional support but also practical assistant. Therefore, the multifunctional livelihood within a communal livestock system provides countless benefits.

The multifunctional framework, as shown in Table 2, recognizes that rural livelihoods are shaped by a multifaceted interaction of economic, environmental, and social factors. From an economic perspective, livelihoods are promoted through direct income, asset accumulation, and improved access to credit, collectively enhancing financial stability. Equally important is environmental contribution, such as support for agriculture and improvement of soil fertility, further contribution to the sustainability of livelihood. Moreover, social, and cultural dimensions are equally significant, wherein asset ownership and involvement of cultural practice promote social cohesion and provide social protection during periods of crisis. Agriculture extension services play a vital role in facilitating the operation of multifunctional aspects by providing knowledge, resources, and market access. By acknowledging and strengthening the multifunctional role within communal systems, you can promote sustainable development.

Table 2. Multifunctionality impacts on livelihood recognition

Multifunctional aspects	Economic impact	Environment Impact	Social Impact
Income	Provision of cash	Support agricultural activities	Recognition through livestock ownership
Resource and asset accumulation	Unrestricted access to credit and more savings	Increase soil fertility	form of social protection during periods of crisis.
Cultural integration	Generates economic opportunities associated with ceremonial events	Promotion of sustainable grazing management	Strengthens social cohesion and preserves collective practice

Source: own work

Challenges within communal livestock farming

Rural livestock farming is facing numerous challenges in various countries including South Africa. Baloyi (2010) pointed that most of them are beyond the control of individual farmers. Despite the economic benefits of communal livestock farming mentioned by Mmbengwa *et al.*, (2016), farmers in rural areas face various challenges that prevent them from earning income from their livestock. These challenges are interconnected, as shown in Figure 4, and lead to negative outcomes for the livelihoods of communal livestock farmers. Therefore, it is important to understand the specific challenges they face in maintaining their agricultural practices. The primary challenges within communal system are highlighted as:

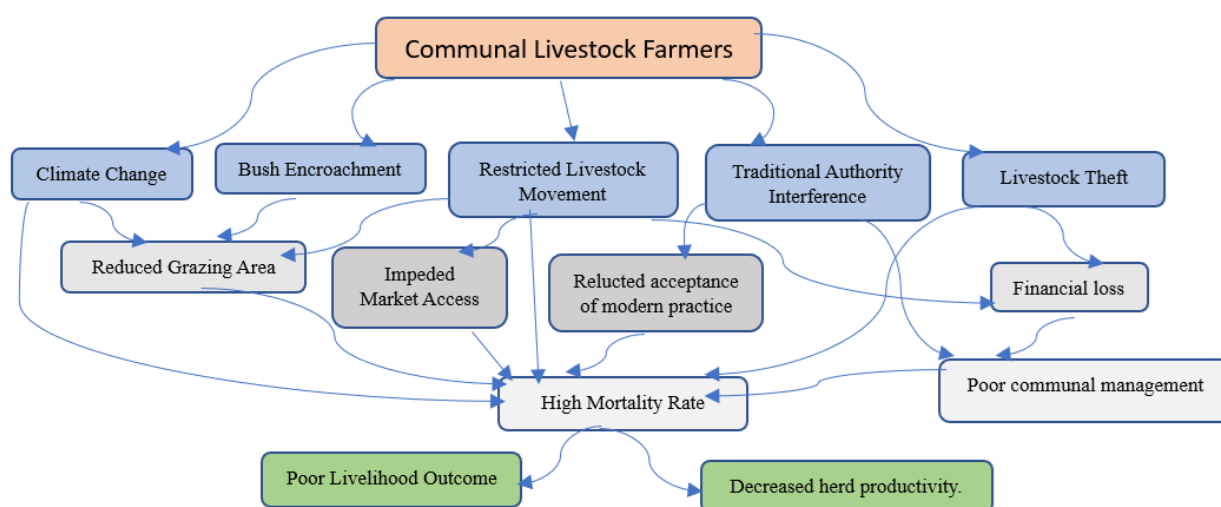


Figure 4. Flowchart for communal livestock challenges

Source: own work

Livestock Theft

The effect of livestock theft on communal livelihoods extends beyond the immediate loss of animal. Livestock theft significantly affects communal farmers, impacting their productivity, financial stability, mental well-being, and social relationships. In communities where livestock farming is a key economic activity, the theft of livestock has led to financial despair for farmers who rely on their animals for both sustenance and income. In many cultures, livestock represent more than a source of income; they are integral to cultural identity and

social status. Therefore, stealing livestock is often seen as an economic setback but as a grave violation of communal values and traditions.

According to Mabunda *et al.* (2021), livestock losses because of theft are predicted to be even higher, given the economic effects of the Covid-19 pandemic, making it difficult for farmers to sustain a lawful living. The situation has become unbearable for communal livestock farmers, particularly affecting rural farmers who own one or two head of cattle. Contemporary trends show that thieves are now slaughtering animals on-site, taking only a small amount of meat, and leaving the carcasses behind. This practice has led to the closure of numerous kraals and a consequent reduction in the overall herd sizes within the livestock farming community. The psychological impact on farmers after their animals are stolen is significant, leading to stress and anxiety due to their vulnerability. In addition to the economic losses, theft undermines trust within rural communities, contributes to social division, and diminishes the sense of solidarity. Farmers may take matters into their own hands, resulting in more violence and conflict within the community. Social cohesion is a vital component for sustainable agricultural development, especially in contexts where community resources and collaborative decision-making play a critical role. Recent advancements in affordable digital technology, combined with community-based rural development approaches, offer new opportunities to create strategies that prevent theft and promote social unity in agricultural communities.

Climate Change and Bush Encroachment

Communal farmers face various environmental challenges, including climate change and bush encroachment. These impacts affect water availability, grazing land quality, livestock health, and overall productivity in diverse ways. Bush encroachment, where woody plants invade grasslands due to climate change, leads to land degradation and reduced carrying capacity. Climate change and bush encroachment pose significant threats to the sustainability of communal livestock systems, especially in semi-arid and rangeland areas of sub-Saharan Africa. However, these improvements are often restricted by factors like resource availability and support systems. The link between climate change and bush encroachment increases the risk for small-scale farmers. As climate stress intensifies, degraded lands become more prone to encroachment, leading to a cycle of reduced productivity, increased food insecurity, and rising poverty.

Smallholders often lack the financial resources, technical support, and infrastructure needed for mitigation strategies like rotational grazing and controlled burning. Additionally, communal land tenure systems hinder collective management of bush encroachment. Lack of defined land-use rights and coordinated community efforts restrict the effectiveness of individual land rehabilitation initiatives. To tackle the impacts of climate change and bush encroachment, collaborative initiatives should combine local wisdom, encourage sustainable methods, and boost community strength. This approach is vital for ensuring the sustainability of cattle farming in communal regions through successful partnerships and strategic actions. Boosting awareness and skills at the local level is crucial to reversing ecological decline and securing sustainable livelihoods in rural areas.

Restriction on Animal Movement

The restrictions on animal movement imposed during Foot and Mouth Disease (FMD) outbreaks present a significant challenge for smallholder livestock farmers in shared community areas. Typically implemented by Government authorities as a measure to control the spread of the disease. However, the negative impacts on livestock farmers such as affecting market access, productivity, and the long-term sustainability of livestock farming operations. These restrictions vary significantly by region and include bans on livestock sales, movement between villages, farms, and transportation to markets, severely limiting farmers' ability to conduct essential activities. The purpose is to strictly prevent the spread of disease, thus hindering their ability to sell livestock. The imposition of movement restrictions has profound impacts on the livelihood and resilience of farmers in shared community areas, leading to a high mortality rate during outbreaks due to limited access to veterinary services or poor grazing, as animals are restricted from moving to the next villages or farms.

Developing proactive strategies and improving communication with authorities can reduce the negative impacts of these restrictions, thereby supporting the sustainability of smallholder livestock farmers in communal areas.

Traditional Authority Interference

Traditional authority plays a key role in management of livestock within communal system, having considerable influence on decision making process that impacts farmer's livelihood. However, Communal farmers have differing perceptions on the effectiveness of traditional authority, most perceive them as slow to respond to emerging threats and reluctant to adopt the latest farming technology.

This may lead to the division of farmers' cohesion, which undermines the essential cooperative spirit for solving shared challenges. The relationship between Traditional Authority and farmers is often influenced by external factors, such as government interventions and market pressures. Managing the tension that arises when state policies conflict with traditional practices becomes increasingly important. Farmers may find themselves choosing their loyalties between traditional leadership and state institution, adding complexity to their efforts to achieve sustainability. Power struggles and a lack of accountability can lead to unfair distribution of communal grazing land, mismanagement of dipping facilities, and resistance to formal institutional support and innovation. Traditional leaders often contribute to fragmented governance, reduced farmer autonomy, and resistance to contemporary livestock practices when they interact is not transparent with official agricultural and land management organizations.

These challenges impact the viability and sustainability of livestock farmers on communal land, requiring holistic and well-coordinated strategies for improvement. These elements collectively increase the mortality rate by limiting access to feed and water, raising the risk of theft and disease exposure, and degrading grazing lands. These factors result in herd reduction, deterioration of animal condition, weakened economic resilience, compromised food security, and undermined social cohesion within farming communities in the communal system. Effective strategies must balance livestock mobility for access to resources, disease control for animal health, land management for sustainability, and community regulation for cooperative farming practices to promote animal survival and enhance farmers' livelihood.

Conclusion and Future Direction

The extant literature reveals that while smallholder livestock farming under communal systems plays a pivotal role in enhancing rural livelihoods, it also remains highly vulnerable to multiple challenges. Addressing these challenges requires a diverse approach, including adjusting farming methods, preventing livestock theft, establishing good governance, and reforming policies. It is essential to offer practical solutions to livestock farmers who depend on livestock production to improve their livelihoods. These strategies are practical and aligned with profitability, efficiency and community structured, enabling livestock farmers to be part of sustainable and growth focused sector. Therefore, agriculture extension services and other stakeholders should work together to support these farmers and improve communal economic stability and food security. From a policy standpoint, it is crucial to manage livestock movement carefully to uphold biosecurity and disease control in communal lands. Policy makers need to prioritize economic viability by issuing adaptable movement permits that support controlled grazing practices. Dealing with short-term challenges and long-term sustainability can empower stakeholders to transition smallholder livestock systems to models that enhance livelihoods, environmental stewardship, and rural community viability. Future studies should concentrate on long-term research, especially considering the lack of data on the enduring impacts of extension services, land tenure reform, and community-based natural resource management on household income, food security, and livestock productivity.

Competing interest

The authors affirm that no conflicts of interest exist that could reasonably be construed as compromising the objectivity or impartiality of the research presented.

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