

Journal of Livestock Policy (JLP)

Livestock Marketing and Economic Development of Rural Areas in Terekeka County in Central Equatoria State, South Sudan

Jamal Abdi Farah, Dr. Milton M. Lado and Dr. Lewis Khamis Jaja



**Livestock Marketing and Economic
Development of Rural Areas in Terekeka
County in Central Equatoria State, South Sudan**



Jamal Abdi Farah¹

Department of Clinical Studies, School of
Veterinary Medicine, University of Juba



Dr. Milton M. Lado²

Department of Clinical Studies, School of
Veterinary Medicine, University of Juba



Dr. Lewis Khamis Jaja³

Department of Clinical Studies, School of
Veterinary Medicine, University of Juba

Article History

Received 19th August 2025

Received in Revised Form 20th September 2025

Accepted 29th October 2025



How to cite in APA format:

Farah, J., Lado, M., & Jaja, L. (2025). Livestock Marketing and Economic Development of Rural Areas in Terekeka County in Central Equatoria State, South Sudan. *Journal of Livestock Policy*, 4(1), 1–24.
<https://doi.org/10.47604/jlp.v4i1.3550>

Abstract

Puprose: The study sought to investigate the role of livestock marketing in the economic development of rural areas, with a specific focus on Terekeka County in Central Equatoria State.

Methodology: The study adopted a positivist research philosophy and a cross-sectional survey design. The target population was 11,836 household heads across four Payams in Terekeka County. Slovin's formula was used in the determination of the sample size, which resulted in a sample of 387 participants. A stratified random sampling technique was used in the selection of the sample to ensure representation from each Payam. Primary data was used, which was collected through semi-structured questionnaires. The research instrument generated both quantitative and qualitative data, which was analyzed using descriptive and inferential statistics through SPSS for quantitative data and thematic analysis for qualitative data.

Findings: The study found that livestock marketing positively influences economic development in Terekeka County by providing households with regular income from the sale of livestock and products. Key barriers such as poor infrastructure, limited market information, and unstable pricing hinder profitability and market efficiency. Enhancing support, training, infrastructure, and extension services could strengthen the sector, boost incomes, and promote inclusive rural economic growth.

Unique Contribution to Theory, Practice and Policy: The study recommends developing a national or state-level livestock marketing policy to improve market infrastructure, promote value addition, and support farmer cooperatives. Additionally, government agencies, non-governmental organizations and development partners should invest in local value addition initiatives, formalize markets and enhance road access.

Keywords: Livestock Marketing, Economic Development, Households, Market Access

JEL Classification: Q13, O13, R20, D13

©2025 by the Authors. This Article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>)

INTRODUCTION

The livestock sector plays a pivotal role in the economic development of both developed and developing countries, offering diverse contributions ranging from food security to employment generation (Duncan et al., 2023; Akash et al., 2022). Contributing approximately 6 percent to global Gross Domestic Product (GDP) and around 25 percent to the Agricultural Gross Domestic Product (Can, 2023), the sector has demonstrated remarkable resilience and adaptability. Over the past two decades, it has grown at an annual rate of 5.6 percent, surpassing the 3.3 percent growth rate of the broader agricultural sector (Lovarelli et al., 2020). This faster growth reflects the rising global demand for animal-source foods, technological progress in breeding, and improved disease management. From a developmental standpoint, such sustained growth indicates that livestock is no longer a supplementary component of agriculture but a catalyst for rural economic transformation, stimulating value chain development, agro-processing, and regional trade (Latino et al., 2020).

However, scholars differ in their interpretation of livestock's transformative potential. While Can (2023) and Lovarelli et al. (2020) view the sector's growth as evidence of its growing contribution to global economic stability and resilience, others caution that these figures mask structural inequalities between industrialized and developing economies. In high-income nations, livestock growth is driven by technological sophistication, efficient value chains, and well-regulated markets, whereas in developing countries, productivity gains are modest due to infrastructural deficits, weak policy support, and market inefficiencies (Gwaka & Dubihlela, 2020; Awoke et al., 2024). Thus, although the livestock sector globally exhibits impressive output statistics, its benefits remain unevenly distributed, calling for deeper examination of context-specific marketing systems and institutional environments.

In developing economies, livestock contributes significantly to agricultural GDP—up to 33 percent in some regions (Abu Hatab et al., 2021; Eeswaran et al., 2022)—and generates wide-ranging multiplier effects through processing, marketing, and service industries. At the household level, livestock ownership enhances asset accumulation, income diversification, and social welfare, serving as both a productive asset and a financial safety net (Igirisa et al., 2020). Studies by Paul et al. (2020) and Akash et al. (2022) further highlight the role of livestock products such as milk, meat, and eggs in improving nutrition and labor productivity. Similarly, Rubino et al. (2023) underscore livestock's contribution to human capital through income flows that finance education and healthcare. Yet, these benefits are not universal. Critics such as Neethirajan and Kemp (2021) argue that livestock's contribution to rural resilience is constrained in regions with volatile market access, climatic shocks, and limited institutional capacity—conditions prevalent in much of Sub-Saharan Africa.

Significant regional disparities exist in the production and marketing of livestock products. In industrialized nations, livestock industries are highly efficient, supported by advanced technology, logistics, and structured value chains that ensure high market returns (Gwaka & Dubihlela, 2020). Conversely, in developing regions, production systems remain largely subsistence-oriented with poor market infrastructure, limited access to finance, and fragmented marketing systems (Awoke et al., 2024). The resulting inefficiencies have hindered the full realization of livestock's potential for rural economic transformation. Despite recognition of these challenges, most empirical studies have focused on countries with relatively stable market environment, such as Kenya, Ethiopia, and Uganda, leaving fragile and post-conflict settings like South Sudan underrepresented in the literature.

This contextual gap is particularly evident in Terekeka County, Central Equatoria State, where livestock farming is both an economic lifeline and a cultural institution. Households primarily rear cattle, goats, and sheep for milk, meat, and income generation (Ajak & Demiryürek, 2021). Livestock ownership also symbolizes wealth and social status, reinforcing its socio-economic significance. Yet, marketing remains largely informal, constrained by poor infrastructure, limited price information, and dependence on middlemen (Worthington, 2017). Seasonal migration in search of pasture and water further disrupts market participation, weakening the link between production and income growth.

Despite the centrality of livestock to rural livelihoods, empirical evidence on how livestock marketing influences rural economic development in Terekeka County remains scarce. Previous studies have explored livestock's role in food security and resilience but have not adequately addressed how market access, value chains, and pricing mechanisms translate into tangible economic outcomes for rural households. This study therefore positions itself within this scholarly conversation by examining the nexus between livestock marketing and economic development in Terekeka County, offering evidence from a post-conflict context that expands current understanding of livestock's developmental role in fragile economies.

Statement of the Problem

South Sudan is endowed with vast natural resources, particularly livestock in Terekeka County of Central Equatoria State, where diverse vegetation zones, ranging from semi-desert in the north and poor savanna in the middle to rich savanna and equatorial climate in the southwest, provide favorable conditions for animal rearing and pastoral livelihoods. The Nile River and its tributaries further enhance the region's ecological potential by supporting year-round pasture and water availability. Beyond livestock, the country possesses abundant mineral resources such as petroleum, iron ore, copper, zinc, and gold, as well as significant hydropower and agricultural potential that remain largely untapped.

Despite this natural wealth, the livestock sector remains underexploited as a driver of economic development. In Terekeka County, livestock production, dominated by cattle, goats, and sheep, is primarily oriented toward cultural prestige, social status, and traditional marriage practices rather than market-oriented production. This non-commercial orientation has fostered frequent cattle raids and competition over grazing areas, undermining economic stability and social cohesion. Moreover, the livestock marketing system is poorly developed, characterized by inadequate infrastructure, weak market linkages, absence of organized value chains, and limited access to reliable market information. These structural weaknesses restrict producers from reaching profitable local and regional markets, limiting income generation and perpetuating household poverty. Consequently, despite the sector's potential, livestock contributes minimally to South Sudan's GDP and rural livelihood improvement. Existing studies on livestock production in South Sudan have largely emphasized issues of conflict, animal health, and pastoral mobility, while empirical evidence on how livestock marketing influences rural economic development remains limited, particularly in Terekeka County.

Guided by the Rural Market Development Theory and the Value Chain Theory, this study isolates livestock marketing as the primary determinant of rural economic development while acknowledging the moderating influence of contextual factors such as infrastructure, information flow, and institutional support. These theoretical perspectives provide a lens for understanding how market access, value addition, and linkages within livestock value chains can stimulate household incomes, enhance employment, and promote local economic

transformation. Therefore, this study seeks to examine how livestock marketing influences the economic development of rural areas in Terekeka County, with the goal of generating policy-relevant insights to strengthen market systems and unlock the sector's developmental potential.

LITERATURE REVIEW

Livestock Marketing and Economic Development

Livestock marketing plays a crucial role in connecting producers with consumers, ensuring that farmers and pastoralists can earn stable incomes while meeting growing market demands. Efficient marketing systems allow livestock owners to access better prices by minimizing intermediaries and increasing transparency (Guyo et al., 2024). While Alders et al. (2021) emphasize the need for institutional reforms and stronger governance frameworks to stabilize livestock markets, Guyo et al. (2024) highlight technology-driven solutions such as digital platforms that enhance price discovery and traceability—illustrating contextual diversity in marketing outcomes. In East Africa, digital livestock exchanges in Kenya and Uganda have improved price efficiency and farmer participation (Munyua & Muriithi, 2021; Wanyoike et al., 2023). Well-developed livestock marketing systems contribute to food security and rural resilience by stabilizing incomes and integrating producers into national value chains (Duncan et al., 2023; Bucini et al., 2023). Moreover, governments and NGOs increasingly invest in training, market access, and financial inclusion programs to help small-scale producers participate competitively in expanding domestic and regional markets.

Livestock contributes significantly to economic development, particularly in low- and middle-income countries where agriculture remains the mainstay of livelihoods. The marketing of livestock and related products—meat, milk, hides, and skins—generates income, employment, and value addition across complementary sectors such as transport, veterinary services, and processing industries (Eeswaran et al., 2022; Gowane et al., 2019). In Ethiopia and Sudan, improved livestock marketing infrastructure, including abattoirs and cold storage facilities, has enhanced trade efficiency and reduced post-harvest losses (Gebremedhin et al., 2021; Ahmed & Elmahdi, 2020). Similarly, Kitole and Sesabo (2022) observe that structured markets in East Africa boost regional exports and foreign exchange earnings. Robust policy frameworks and supportive regulations encourage private-sector investment, fostering innovation and growth within the livestock value chain. Furthermore, livestock marketing empowers marginalized groups—especially women and youth—by enabling participation at various nodes of production, processing, and retail (Al-Ghaswyneh, 2022; Wekesa et al., 2020). Strengthening market systems thus directly supports rural entrepreneurship and sustainable economic transformation.

Despite its potential, livestock marketing in developing economies continues to face structural and operational challenges. Poor road networks, inadequate market facilities, and limited access to reliable market information constrain producers from realizing fair prices (Guyo et al., 2024). Additionally, disease outbreaks and weak veterinary infrastructure limit trade competitiveness and international compliance (Auma & Badr, 2022). Evidence from Kenya and Uganda indicates that mobile technology and digital trading platforms can significantly mitigate these barriers by improving real-time information flow and linking producers directly with buyers (Wanyama et al., 2021). Public-private partnerships (PPPs) and regional trade agreements have also emerged as critical enablers for modernizing livestock markets and promoting export diversification (Chima, 2023; Georges et al., 2019). Addressing these constraints through coordinated investment, policy reform, and technological innovation can

enhance market efficiency, empower producers, and strengthen the contribution of the livestock sector to overall economic stability and growth in South Sudan and the wider East African region.

Recent empirical evidence further suggests that market performance is influenced not only by infrastructure and policy but also by social networks and cultural norms shaping livestock trade (Woldemichael et al., 2023). In pastoral areas of Kenya, Ethiopia, and South Sudan, trust-based relationships often substitute for formal contracts, facilitating trade even in poorly regulated environments (Bekele et al., 2021). However, this informal system can restrict market expansion and limit price transparency. Strengthening producer cooperatives and enhancing access to market information through community-based institutions can improve bargaining power and efficiency. Moreover, regional integration under frameworks such as the Intergovernmental Authority on Development (IGAD) and the African Continental Free Trade Area (AfCFTA) offers opportunities to harmonize standards, improve cross-border trade, and expand access to larger livestock markets (Adan & Hussein, 2023).

To realize the full potential of livestock marketing in driving rural economic development, South Sudan must pursue an integrated approach that combines infrastructure investment, institutional strengthening, and technological adoption. Policy reforms that address land tenure security, animal health systems, and value chain financing are essential for market efficiency (Lado & Aguto, 2024). Learning from neighboring countries such as Kenya's Livestock Market Information System (LMIS) and Ethiopia's Borena market cooperative model can provide contextually relevant strategies for enhancing market transparency and resilience (Yoseph et al., 2023). By promoting sustainable production practices, developing regional value chains, and facilitating financial inclusion, South Sudan can transform livestock marketing into a cornerstone of rural economic development, job creation, and poverty reduction.

Theoretical Review

The market development theory, originally proposed by Adam Smith (1776) in *The Wealth of Nations* and expanded by Alfred Marshall (1890), posits that economic growth is driven by market expansion, specialization, and efficient exchange systems. Smith emphasized that when producers specialize according to comparative advantage, productivity and innovation rise, while Marshall elaborated on how markets facilitate resource allocation through supply and demand dynamics. The theory underscores the importance of well-functioning markets in fostering competition, stimulating production, and promoting economic welfare. Modern interpretations highlight that efficient market systems remain central to achieving sustainable development, particularly in transitioning economies where structural reforms can enhance inclusivity and growth (Todaro & Smith, 2020).

In Terekeka County in Central Equatoria State, South Sudan, the market development theory provides an analytical framework for understanding how efficient livestock markets can stimulate rural economic development. By improving infrastructure, price transparency, and market linkages, livestock producers can transition from subsistence to commercialized production. This shift enhances income generation, employment, and value addition across the livestock value chain. Recent studies emphasize that developing market systems in rural Africa increases smallholder participation, fosters competitiveness, and reduces poverty through enhanced access to regional and national markets (Munyua & Muriithi, 2021; Njuki et al., 2022; Woldemichael et al., 2023). For Terekeka, structured livestock markets can unlock the

region's economic potential by integrating pastoralists into formal trade systems, supporting entrepreneurship, and fostering resilient rural economies aligned with sustainable development goals.

Conceptual Framework

Figure 1 shows the relationship between the independent variable and the dependent variable. The independent variable was livestock marketing and the dependent variable was economic development.

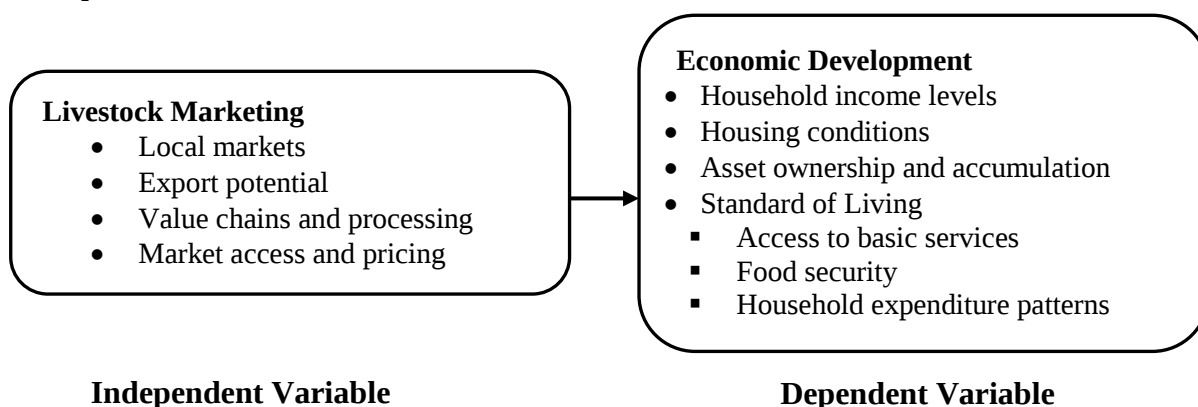


Figure 1: Conceptual Framework

METHODOLOGY

This study adopted a positivist research philosophy and a cross-sectional survey design. This study focused on four of the 10 Payams in Terekeka County. These Payams included Terekeka, Muni, Nyori, and Tombek, which collectively have a population of 58,213. The unit of observation was household heads in the four Payams in Terekeka County. Household heads were selected as the unit of observation because they are typically the primary decision-makers and possess comprehensive knowledge about the household's economic activities, including livestock ownership and management. Therefore, the target population was 11,836 household heads in Terekeka, Muni, Nyori, and Tombek Payams in Terekeka County.

Slovin's formula was used in the determination of the sample size. The formula was as follows:

$$n = \frac{N}{1 + N(e^2)}$$

Where: n = sample size; N = total population size; e = margin of error (0.05 for 5%)

$$n = \frac{11,836}{1 + (11,836 * (0.05^2))}$$

$$n = 387$$

Thus, the sample size was 387 household heads. Table 1 shows the proportionate distribution of the sample size per the Payams.

Table 1: Sample Size

Payam	Total Households	Sample Size
Terekeka	3,856	126
Muni	4,058	133
Nyori	2,233	73
Tombek	1,689	55
Total	11,836	387

Stratified random sampling was used in the selection of the sample size. The population was stratified according to the four Payams, Terekeka, Muni, Nyori, and Tombek, to ensure representation from each administrative unit. Stratified sampling is particularly appropriate for this study due to potential socio-economic and demographic differences across the Payams. Within each Payam, simple random sampling was used to select household heads using an online random number generator. The study made use of both primary and secondary data. Secondary data was obtained from the South Sudan National Bureau of Statistics, relevant government reports, reports by non-governmental organizations (NGOs), as well as through a systematic review of existing literature to provide background information, contextual understanding, and support for analysis and interpretation of findings. Primary data was collected by use of semi-structured questionnaires.

The research instrument generated both qualitative and quantitative data. Thematic analysis was used to analyze qualitative data from the open-ended questions in the questionnaire. The results were presented in a narrative form. Quantitative data was analyzed by use descriptive and inferential statistics with the help of Statistical Package for Social Sciences (SPSS version 28), a statistical software. Descriptive statistics comprised of frequency distribution, percentages, standard deviation, and mean. Inferential statistics, such as correlation analysis and regression analysis, were used to assess the relationship between the indepndnet varioable and the depdnet variable. The regression model was as follows;

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Whereby: Y = Dependnet Variable (Economic Development); β_0 = Intercept; β_1 = Coefficient for Livestock Marketing; X_1 = Indipendent Variable (Licestock Marketing); ε = Error term

Results and Discussions

A total of 387 household heads were sampled across four Payams in Terekeka County. However, the total number of responses received was 400, resulting in an overall response rate of 103.36%. This shows that there was high engagement and cooperation from the community. High response rates, especially above 100%, enhance the reliability and generalizability of the study findings, as they reduce the likelihood of non-response bias. Creswell and Clark (2021) argues that an acceptable response rate depends on the nature of the study, but generally, a response rate of 50% is considered adequate, 60% is good, and 70% or more is very good.

Table 2: Response Rate

Payam	Sample Size	Responses	Response Rate
Terekeka	126	129	102.38
Muni	133	136	102.26
Nyori	73	77	105.48
Tombek	55	58	105.45
Total	387	400	103.36

Livestock Marketing

The study sought to examine the how livestock marketing influences economic development of rural areas in Terekeka County in Central Equatoria State.

Markets and Channels for Selling Livestock and Livestock Products

The respondents were asked to identify the main markets or channels through which they sell livestock and livestock products. As shown in Table 3, the local village market was the most common outlet, reported by 33.75% (135) of respondents, followed by the Terekeka town market at 26.75% (107). Sales to Juba or other larger urban centers accounted for 20.25% (81), while 19.25% (77) sold mainly through middlemen or traders

Table 3: Markets and Channels for Selling Livestock and Livestock Products

Markets and Channels	Frequency	Percent
Local village market	135	33.75%
Terekeka town market	107	26.75%
Juba or larger cities	81	20.25%
Middlemen/traders	77	19.25%
Total	400	100.00%

Livestock-Related Products Sold

The respondents were asked to indicate the livestock products they commonly sell. As shown in Figure 2, milk ranked highest, reported by 110 respondents (27.5%), followed by live animals at 101 (25.25%) and meat at 83 (20.75%). Eggs were sold by 61 respondents (15.25%), while hides/skins and manure were less common at 24 (6.0%) and 21 (5.25%), respectively. These findings suggest that dairy products and live animals dominate sales, reflecting both household reliance and strong market demand. This aligns with Mbatha (2021), who noted dairy's consistency in consumption and live animals' role in income, social status, and emergency liquidity.



Figure 2: Livestock-Related Products Sold

Frequency of Selling Livestock or Livestock Products

As shown in Figure 3, 37.75% (151) of respondents sold livestock or products weekly, reflecting regular engagement in trade, while 31.25% (125) reported monthly sales. Seasonal sales were noted by 23.25% (93), often linked to agricultural cycles or market demand, and only 7.75% (31) sold rarely. These findings suggest that most households maintain frequent market participation, primarily weekly or monthly. This supports Chatibura (2023), who highlight regular livestock sales as a key livelihood strategy for smallholder farmers.

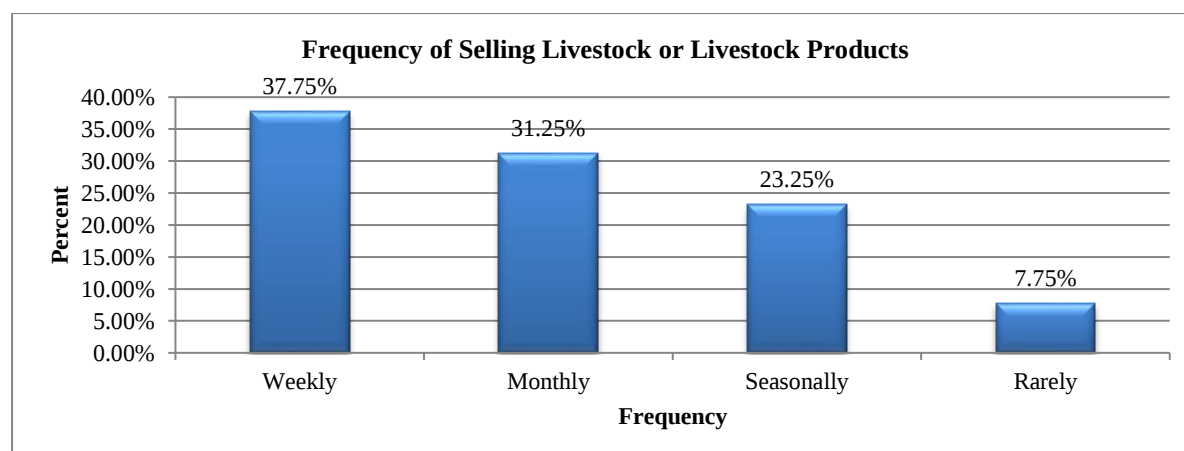


Figure 3: Frequency of Selling Livestock or Livestock Products

Challenges in Selling Livestock and Livestock Products

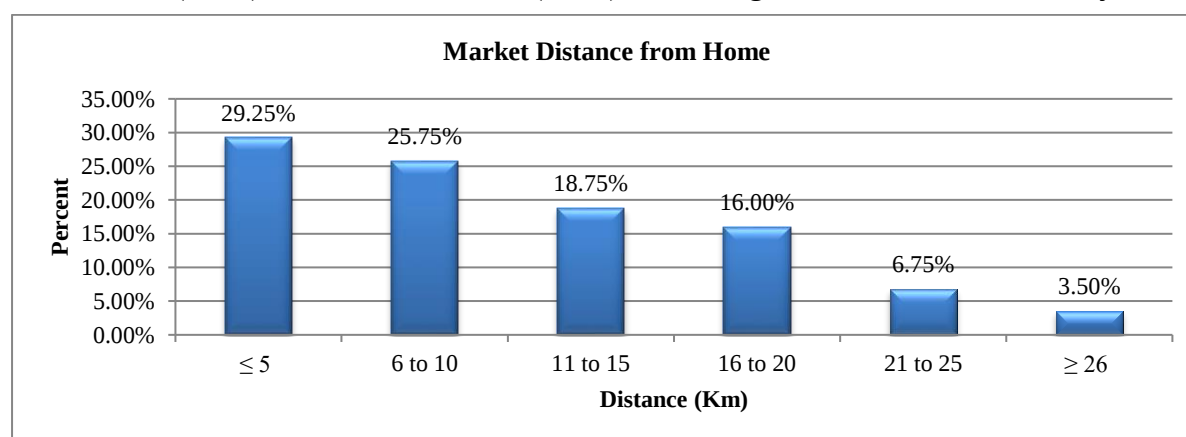
As shown in Table 4, the main challenge in selling livestock and related products was lack of buyers, cited by 31.75% (127) of respondents, followed by unstable prices at 28.25% (113), reflecting income uncertainty. About 16.0% (64) mentioned absence of formal markets, while 14.25% (57) cited limited access to market information. Poor road access was noted by 8.0% (32), hindering transport, and 1.75% (7) highlighted other issues, including high transport costs, insecurity, and lack of credit. These results reveal multiple market and infrastructure barriers, aligning with Al-Ghaswyneh (2022) on challenges limiting livestock producers' effective market participation.

Table 4: Challenges in Selling Livestock and Livestock Products

Major Challenges	Frequency	Percent
Poor road access	32	8.00%
Lack of buyers	127	31.75%
Unstable prices	113	28.25%
Lack of information	57	14.25%
No formal market	64	16.00%
Others	7	1.75%
Total	400	100.00%

Market Distance from Home

The respondents were asked to indicate the distance they travel to reach livestock markets. Table 4 shows that most (29.25%) travel 5 km or less, while 25.75% cover 6 to 10 km. Another 18.75% reported 11 to 15 km, and 16.0% (64) travel 16 to 20 km. Smaller proportions travel 21 to 25 km (6.8%) or 26 km and above (3.5%), indicating varied market accessibility.

*Figure 4: Market Distance from Home***Livestock Market Analysis in the Last Three Months in Terekaka**

The findings, as shown in Table 5, indicate that most respondents sold cattle through direct sales (95.0%), while few used brokers (3.8%) or group marketing (1.3%), reflecting limited access to formalized channels (Catley, 2018; Idris, 2018). Sales were concentrated in nearby market towns (90.8%), with smaller shares in village markets (6.5%), farm gates (2.0%), and rarely in regional markets (0.3%) or abattoirs (0.5%). Logistical constraints, insecurity, and weak linkages limit broader access. Regarding reasons for sale, the main drivers were animals no longer needed (52.0%), food purchase (29.0%), and medical costs (10.3%), showing cattle are often sold for household needs rather than profit (Catley & Ayele, 2021).

Table 5: Cattle Market Analysis in the Last Three Months

Variables	Categories	Frequency (N)	Percentage (%)
Mode of Cattle Sale	Direct sale	380	95.0%
	Through brokers	15	3.8%
	Group marketing	5	1.3%
Location of Cattle Sale	Farm gate	8	2.0%
	Village/market	26	6.5%
	Nearest market town	363	90.8%
	Regional market	1	0.3%
	Abattoir/butchery	2	0.5%
Reason for Cattle Sale	No longer needed	208	52.0%
	To pay normal daily expenses	12	3.0%
	To buy food	116	29.0%
	To pay medical expenses	41	10.3%
	To pay other emergencies	7	1.8%
	To pay school fees	8	2.0%
	To pay debts	8	2.0%

Goat/Sheep Market Analysis in the Last Three Months in Terekaka

The results, as shown in Table 6, show that almost all goat and sheep sales in the past three months were through direct transactions (98.0%; 392), with only 1.8% (7) via brokers and 0.3% (1) through group marketing, consistent with Angok et al. (2021) and Catley (2018). Most sales occurred at village or local markets (84.0%; 336), followed by nearby towns (14.3%; 57), while farm gate, regional markets, and abattoirs accounted for only 0.3% each. Food purchases (36.3%; 145) and medical costs (35.5%; 142) were the main reasons for sales, alongside daily expenses (12.0%), school fees (10.8%), and emergencies. These findings underscore the role of small ruminant sales as a coping strategy in economically vulnerable households (Catley & Ayele, 2021).

Table 6: Goat/Sheep Market Analysis in the Last Three Months

Variables	Categories	Frequency (N)	Percentage (%)
How Goat/Sheep Were Sold	Direct sale	392	98.0%
	Through brokers	7	1.8%
	Group marketing	1	0.3%
Where Goat/Sheep Were Sold	Farm gate	5	1.3%
	Village/market	336	84.0%
	Nearest market town	57	14.3%
	Regional market	1	0.3%
	Other (specify)	1	0.3%
Reason of sale goat/sheep	No longer needed	10	2.5%
	To pay normal daily expenses	48	12.0%
	To buy food	145	36.3%
	To pay medical expenses	142	35.5%
	To pay other emergencies	7	1.8%
	To pay school fees	43	10.8%
	To pay debts	4	1.0%
	Others (Specify)	1	0.3%

Poultry Market Analysis in the Last Three Months in Terekaka

In the past three months, most poultry sales in Terekaka were conducted through direct selling (88.5%; 354), with smaller proportions using brokers (2.0%), group marketing (0.8%), or other methods (8.8%). Similarly, most sales occurred in village markets (83.3%), followed by nearby towns (5.8%), farm gates (1.3%), and regional markets (0.5%). This reliance on local sales reflects infrastructural challenges and limited collective marketing, restricting bargaining power and access to higher-value markets (Idris, 2018; Angok et al., 2021). Regarding motivations, over half (54.0%) sold poultry to cover daily expenses, while others cited school fees (21.3%), medical costs (7.8%), or emergencies. These findings highlight poultry's role as a readily disposable household asset supporting routine and urgent needs (Catley & Ayele, 2021).

Table 7: Poultry Market Analysis in the Last Three Months in Terekaka

Variables	Categories	Frequency (N)	Percentage (%)
How Poultry was Sold	Direct sale	354	88.5%
	Through brokers	8	2.0%
	Group marketing	3	0.8%
	Others (Specify)	35	8.8%
Where Poultry was Sold	Farm gate	5	1.3%
	Village/market	333	83.3%
	Nearest market town	23	5.8%
	Regional market	2	0.5%
	Others (Specify)	37	9.3%
Reason of Poultry Sale	No longer needed	3	0.8%
	To pay normal daily expenses	216	54.0%
	To buy food	14	3.5%
	To pay medical expenses	31	7.8%
	To pay other emergencies	7	1.8%
	To pay school fees	85	21.3%
	To pay debts	7	1.8%
	Others (Specify)	37	9.3%

Average Price of Livestock (in SSP) during Drought

Table 8 presents livestock prices during drought across Terekaka County. Cattle prices were highest in Nyori (267,070 SSP), followed by Tombek (263,600 SSP) and Muni (255,858 SSP), with Terekaka lowest at 219,000 SSP. This reflects higher values in less drought-affected or remote areas, consistent with Nigeria et al. (2020). Goat prices peaked in Muni (56,262 SSP) and were lowest in Terekaka (43,300 SSP). Sheep showed a similar trend, highest in Tombek (52,350 SSP) and lowest in Terekaka (42,800 SSP). Poultry also followed this pattern, with Nyori highest (12,242 SSP) and Terekaka lowest (9,540 SSP). Consistently lower prices in Terekaka suggest market saturation, weak purchasing power, and oversupply, aligning with LaRocco (2020).

Table 8: Average Price of Livestock (in SSP) During Drought

Livestock	Payams			
	Nyori	Muni	Tombek	Terekaka
Cattle	267,070	255,858	263,600	219,000
Goats	53,333	56,262	52,350	43,300
Sheep	51,484	51,060	52,350	42,800
Poultry	12,242	10,707	10,900	9,540

Average Price of Livestock (in SSP) during Plenty Season

During the plenty season, livestock prices in Terekaka County declined due to increased supply, with notable variations across payams. Cattle prices peaked in Muni (204,356 SSP), followed by Nyori (197,626 SSP), Tombek (191,100 SSP), and Terekaka lowest (170,950 SSP), reflecting stronger market conditions in Muni (Eeswaran et al., 2022). Goats were highest in Tombek (34,620 SSP) and lowest in Terekaka (27,330 SSP), while sheep followed a similar

trend, led by Muni (35,891 SSP). Poultry was lowest in Terekaka (5,010 SSP) and highest in Nyori (7,535 SSP). Consistently low prices in Terekaka highlight weaker market infrastructure and oversupply (Mayala et al., 2019).

Table 9: Average Price of Livestock (in SSP) During Plenty Season

Livestock	Payams			
	Nyori	Muni	Tombek	Terekaka
Cattle	197,626 SSP	204,356 SSP	191,100 SSP	170,950 SSP
Goats	31,252 SSP	34,356 SSP	34,620 SSP	27,330 SSP
Sheep	30,848 SSP	35,891 SSP	31,460 SSP	27,350 SSP
Poultry	7,535 SSP	5,108 SSP	6,590 SSP	5,010 SSP

Value Addition Activities Done Before Sale

The respondents were asked if they carried out value addition activities before selling livestock products. A majority, 87.75% (351), confirmed doing so, while 12.25% (49) did not. Reported practices included drying or smoking meat for preservation, boiling and packaging milk to enhance hygiene, producing ghee or fermented milk, and cleaning or sorting hides and skins to improve appeal. These activities were viewed as strategies to enhance product quality and profitability. Consistent with Anno et al. (2022) and Mbatha (2021), such practices boost marketability, consumer preference, and pricing, while expanding income and opportunities, particularly for producers supplying urban and formal markets.

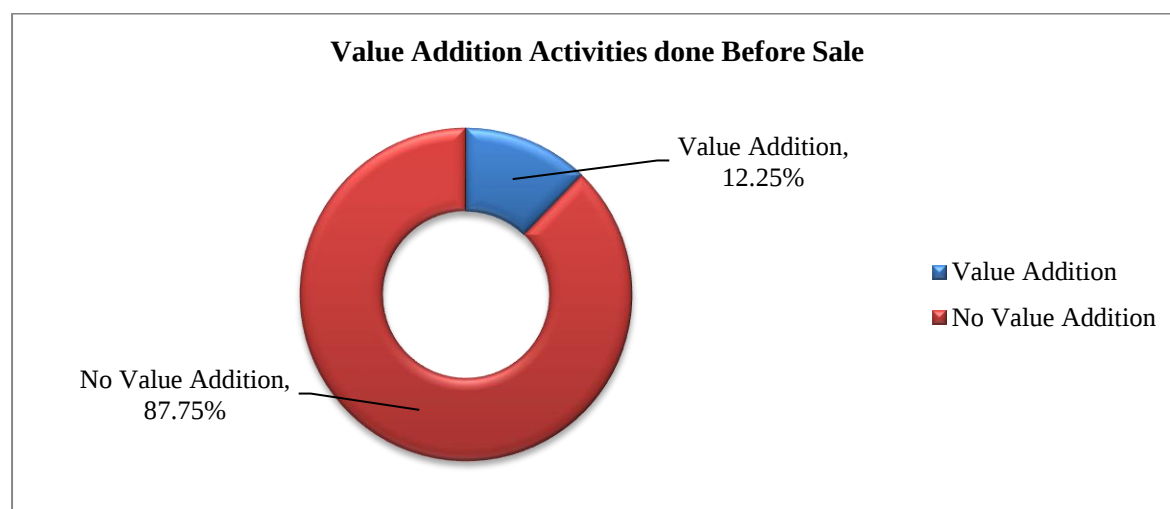


Figure 5: Value Addition Activities done before Sale

Aspects of Livestock Marketing

The respondents were requested to specify the extent to which they agree with various statements on livestock marketing. According to the study findings as illustrated in Table 10, the respondents agreed with a mean of 4.088 (SD = 0.835) that they have access to a reliable market for selling livestock. These findings concur with Guyo et al. (2024), who found that access to reliable markets significantly enhances livestock sales by providing farmers with consistent demand, better prices, and reduced transaction costs. In addition, the respondents agreed with a mean of 4.093 (SD = 0.855) that the prices of livestock products in the market are fair. The respondents also agreed with a mean of 4.155 (SD = 0.820) that they know where and how to sell their livestock products for good profit. With a mean of 4.040 (SD = 0.846),

respondents agreed that transport and infrastructure challenges affect livestock marketing. Additionally, respondents agreed with a mean of 4.005 (SD = 0.847) that there is potential for exporting livestock from this region. These findings conform to the observations of Alders et al. (2021), who noted that the potential for exporting livestock from this region is influenced by factors such as animal health standards, market infrastructure, and cross-border trade policies.

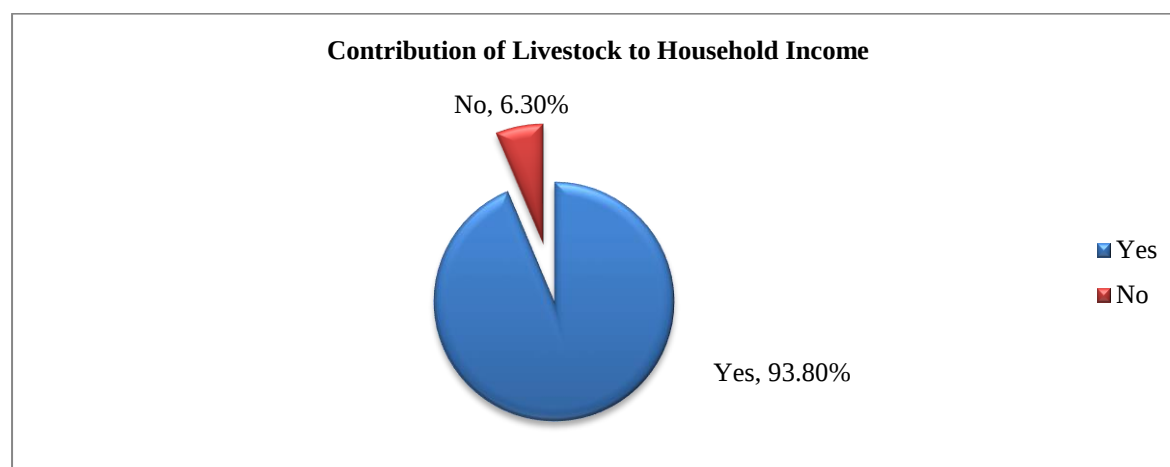
Table 10: Aspects of Livestock Marketing

	N	Mean	Std. Deviation
I have access to a reliable market for selling livestock.	400	4.088	.835
The prices of livestock products in the market are fair.	400	4.093	.855
I know where and how to sell my livestock products for good profit.	400	4.155	.820
Transport and infrastructure challenges affect livestock marketing.	400	4.040	.846
There is potential for exporting livestock from this region.	400	4.005	.847

Economic Development

Contribution of Livestock to Household Income

The respondents were asked whether livestock production contributes to household income. As shown in Figure 6, 93.8% (375) affirmed its role, while only 6.3% (25) reported no contribution. Livestock provides cash through sales of animals and products like milk, eggs, hides, and meat, while also reducing costs by supplying manure and draft power. The few households reporting no contribution may face limited herds, poor market access, or alternative livelihoods. Overall, livestock remains central to rural income and poverty reduction.

*Figure 6: Contribution of Livestock to Household Income*

Contribution of Livestock to Household Livelihood and Well-being

The findings highlight livestock's vital role in enhancing household well-being across multiple dimensions. As shown in Table 11, 30% (120) of respondents reported improved food supply from livestock, underscoring its value in providing milk, meat, and eggs while buffering against food insecurity. Income from livestock also enhanced healthcare access for 23.3% (93) and

supported children's education for 22.8% (91), covering fees, materials, and transport. Additionally, 19.8% (79) linked livestock income to better housing, while 4.3% (17) cited benefits such as income stability, reinvestment, and social status. Overall, livestock strengthens resilience and promotes rural development.

Table 11: Contribution of Livestock to Household Livelihood and Well-being

Category	Frequency	Percent
Better housing	79	19.8%
Education of children	91	22.8%
Health care access	93	23.3%
Food supply	120	30.0%
Others	17	4.3%
Total	400	100.0%

Types of Housing among Respondents' Families

The study assessed respondents' housing conditions as shown in Table 12. Most households lived in grass-thatched huts (33.8%) or mud-walled houses (32.3%), reflecting reliance on modest structures. Another 22.8% resided in semi-permanent dwellings, indicating some progress toward stability, while only 11.3% occupied permanent houses, suggesting better economic standing. Overall, the findings reveal that the majority still live in basic housing, highlighting persistent socio-economic challenges.

Table 12: Types of Housing among Respondents' Families

Category	Frequency	Percent
Grass-thatched hut	135	33.8%
Mud-walled house	129	32.3%
Semi-permanent house	91	22.8%
Permanent house	45	11.3%
Total	400	100.0%

Assets Owned by Household

As shown in Table 13, asset ownership provides insight into households' economic status and access to services. Radios were most common (30.25%), followed by bicycles (27.25%) and mobile phones (24.5%), reflecting reliance on basic communication and transport. Solar panels (7%) and televisions (4.75%) indicated limited access to electricity and renewable energy. Financial inclusion was notably low, with only 3.5% reporting bank accounts. Motorbike (2.25%) and vehicle (0.5%) ownership was rare due to high costs. Overall, 61.25% owned at least one of the top three assets, while ownership of higher-value assets remained minimal, highlighting persistent economic constraints.

Table 13: Assets Owned by Household

Category	Frequency	Percent
Motor vehicle	2	0.5%
Bicycle	109	27.3%
Radio	121	30.3%
Mobile phone	98	24.5%
Television	19	4.8%
Solar panel	28	7.0%
Motorbike	9	2.3%
Bank account	14	3.5%
Total	400	100.0%

Frequency of Daily Meals Consumed by Households

As shown in Table 14, 45.5% of households consumed two meals daily, reflecting moderate food security, while 26.5% survived on just one meal, indicating vulnerability. About 23.8% reported three meals, suggesting better access, and only 4.3% had more than three. These findings highlight disparities in food intake and the need for targeted food security interventions.

Table 14: Frequency of Daily Meals Consumed by Households

Category	Frequency	Percent
One	106	26.5%
Two	182	45.5%
Three	95	23.8%
More than three	17	4.3%
Total	400	100.0%

Income Spent across Basic Services

The respondents were asked to rate their level of expenditure in each category using a five-point scale: Very High, High, Medium, Low, and None. As shown in Table 15, households allocated most of their income to food, with 80% reporting high or very high expenditure, underscoring the centrality of food security amid economic instability and shortages. Healthcare was also a major burden, as 55% spent heavily, reflecting high medical costs and limited access to affordable services. Education followed closely, with 50% reporting high or very high spending, showing strong commitment despite financial barriers. Clothing ranked lower, with 45% spending little or nothing, suggesting prioritization of urgent needs. Livestock inputs were the least prioritized, with 62.5% reporting low or no expenditure, highlighting reduced reliance on livestock-based livelihoods.

Table 15: Income Spent Across Basic Services

Expense Type	Very High	High	Medium	Low	None
Food	180 (45%)	140 (35%)	60 (15%)	15 (3.75%)	5 (1.25%)
Health care	100 (25%)	120 (30%)	90 (22.5%)	60 (15%)	30 (7.5%)
Education	90 (22.5%)	110 (27.5%)	100 (25%)	70 (17.5%)	30 (7.5%)
Clothing	30 (7.5%)	80 (20%)	110 (27.5%)	120 (30%)	60 (15%)
Livestock inputs	20 (5%)	50 (12.5%)	80 (20%)	100 (25%)	150 (37.5%)

Inferential Statistics

Inferential statistics refers to the techniques used to analyze sample data and make generalizations, predictions, or inferences about a larger population. Inferential statistics, such as Correlation Analysis and Regression Analysis,

Correlation Analysis

As shown in Table 16, livestock marketing had a positive, though statistically insignificant, correlation with economic development ($r = 0.543$, $p\text{-value} = 0.000$). Since the $p\text{-value}$ is less than 0.05, the relationship is statistically significant. This indicates that enhancement in livestock marketing practices would likely result in an improvement in economic development. These findings align with Bucini et al. (2023) observations that market practices plays a critical role in fostering economic progress.

Table 16: Pearson Correlation Coefficients

		Economic development	Livestock Marketing
Economic Development	Pearson	1	
	Correlation		
	Sig. (2-tailed)		
Livestock Marketing	N	400	
	Pearson	.543**	1
	Correlation		
	Sig. (2-tailed)	.000	
	N	400	400

Regression Analysis

A linear regression was employed to evaluate the strength of the relationship between livestock marketing and economic development in rural areas, with a specific focus on Terekeka County in Central Equatoria State. The R-squared value for the association between the independent and the dependent variables was 0.295, as shown in Table 17. This means that 29.5% of the variability in the dependent variable (economic development) can be explained by the independent variable (livestock marketing) included in the model.

Table 17: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.543 ^a	.295	.287	.57898

a. Predictors: (Constant), Livestock Marketing

As indicated in Table 18, the F-calculated value of 125.313 was above the F-critical value (3.841). In addition, the $p\text{-value}$ associated with the F-statistic was 0.000, indicating that the overall regression model is statistically significant. Therefore, the regression model can be used to explain the impact of livestock marketing on economic development.

Table 18: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	16.444	1	16.444	125.313	.000 ^b
	Residual	52.227	398	0.131		
	Total	68.671	399			

a. Dependent Variable: Economic Development

b. Predictors: (Constant), Livestock Marketing

The regression was as follows:

$$Y = 1.980 + 0.284X_2 + \varepsilon$$

The findings revealed that livestock marketing has a positive and significant influence on economic development in Terekeka County ($\beta_1 = 0.284$, $p\text{-value} = 0.013$). The relationship was considered significant because the $p\text{-value}$ (0.013) was below the significance level of 0.05. This means that enhanced livestock marketing improves economic development. These findings conform to Guyo et al. (2024), who observed that efficient marketing systems contribute to local economic empowerment.

Table 19: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.98	0.563		3.517	0.001
	Livestock Marketing	0.284	0.111	0.231	2.559	0.013

a. Dependent Variable: Economic Development

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study concludes that livestock marketing significantly contributes to rural economic development in Terekeka County by enhancing household income stability, employment creation, and local trade dynamics. The findings extend existing literature by providing empirical evidence from South Sudan, a region previously underrepresented in livestock market research. Consistent with Guyo et al. (2024) and Duncan et al. (2023), the study confirms that well-functioning livestock markets improve producer earnings and strengthen community resilience. However, it contrasts with studies in Kenya and Ethiopia (Wanyoike et al., 2023; Gebremedhin et al., 2021) by revealing deeper structural challenges, poor infrastructure, unstable prices, and weak institutional support that limit market efficiency in post-conflict contexts. The study advances knowledge by demonstrating that integrating value addition and government-led infrastructure investments can transform livestock marketing into a sustainable driver of inclusive rural growth. It underscores the need for targeted policies to enhance market access, information systems, and producer capacity.

Recommendations

Based on the findings of the current study it is worthy to recommend the following:

1. A national or state-level livestock marketing policy should be developed to improve infrastructure and promote value addition. This policy should prioritize the construction and regulation of livestock markets with adequate facilities such as water points, auction pens, and transport infrastructure. It should also support farmers' cooperatives and SMEs involved in meat, milk, and hide processing.
2. Government agencies, NGOs, and development partners should support value addition and market formalization in Terekeka County by promoting small-scale processing of milk, meat, and manure, while establishing permanent livestock market structures with pens, water points, and sanitation facilities. Additionally, improving road infrastructure to connect remote areas will enhance market access, stimulate micro-enterprise development, and increase household incomes, particularly benefiting women and youth involved in livestock production.
3. The study was confined to Terekeka County and hence its findings cannot be generalized to other counties or regions. Therefore, the research recommends that further studies be conducted to examine the role of livestock marketing in economic development across other counties in Central Equatoria State and beyond. In addition, further research should be carried out to explore other potential factors affecting the contribution of livestock to rural economic development in Terekeka County, including the impact of climate change, policy frameworks, and market infrastructure.

Based on the findings of this study, the following recommendations are proposed:

- **Short-Term Recommendations (1–2 years):** The Terekeka County Government, in collaboration with the Ministry of Animal Resources and Fisheries (MARF) and NGOs, should prioritize upgrading existing local livestock markets with essential facilities such as watering points, shade, sanitation, and weighing stations. Immediate rehabilitation of feeder roads connecting rural markets to urban centers should also be undertaken to enhance market access and reduce transportation costs.
- **Medium-Term Recommendations (3–5 years):** The State Government of Central Equatoria, in partnership with development partners, FAO, and UNDP, should promote small-scale livestock product processing (milk, meat, hides, and manure) through capacity-building programs, microfinance support, and establishment of cooperatives. Introducing standardized market information systems and formalized auction procedures will increase transparency, stabilize prices, and attract private sector participation.
- **Long-Term Recommendations (5 years and beyond):** The National Ministry of Livestock and Fisheries, working with academic institutions and policy research organizations, should develop a comprehensive National Livestock Marketing Policy to guide infrastructure development, regulate trade practices, and promote sustainable value chains. Further research should expand to other counties and states to assess regional variations and explore additional factors influencing livestock's role in economic development, such as climate change adaptation, governance structures, and cross-border trade dynamics.

REFERENCES

- Abu Hatab, A., Krautscheid, L., & Boqvist, S. (2021). COVID-19, Livestock Systems and Food Security in Developing Countries: A Systematic Review of an Emerging Literature. *Pathogens*, 10(5), Article 5. <https://doi.org/10.3390/pathogens10050586>
- Adan, A., & Hussein, S. (2023). Regional integration and livestock trade under the African Continental Free Trade Area. *African Economic Policy Review*, 9(2), 118–135.
- Ahmed, M., & Elmahdi, H. (2020). Livestock trade and economic growth in Sudan: Challenges and opportunities. *African Journal of Agricultural Economics*, 15(3), 245–259.
- Ajak, J., & Demiryürek, K. (2021). Familiarizing livestock advisory services to reduce cattle raiding in South Sudan. *International Journal of Agricultural Extension*, 9(1). <https://doi.org/10.33687/ijae.009.01.3468>
- Akash, Hoque, M., Mondal, S., & Adusumilli, S. (2022). Chapter Four—Sustainable livestock production and food security. In S. Mondal & R. L. Singh (Eds.), *Emerging Issues in Climate Smart Livestock Production* (pp. 71–90). Academic Press. <https://doi.org/10.1016/B978-0-12-822265-2.00011-9>
- Alders, R. G., Bagnol, B., & Pym, R. A. E. (2021). Institutional reforms and sustainable livestock marketing systems in developing countries. *World Development*, 143, 105478.
- Al-Ghaswyneh, O. F. (2022). Empowering rural women through livestock entrepreneurship: Evidence from emerging economies. *Journal of Development and Agricultural Economics*, 14(1), 21–32.
- Auma, D., & Badr, H. (2022). Digital market innovations and rural livestock commercialization in East Africa. *Information Technology for Development*, 28(4), 774–790.
- Auma, S., & Badr, N. (2022). Assessment of the impacts of climate change on livestock water sources and livestock production: Case study, Karamoja region of Uganda. *World Water Policy*, 8(2), 180–200. <https://doi.org/10.1002/wwp2.12086>
- Awoke, M., Abera, W., Tamene, L., Mulatu, K., & Tesfaye, A. (2024). Understanding farm typology for targeting agricultural development in mixed crop-livestock farming systems of Ethiopia. *Farming System*, 2(3), 100088. <https://doi.org/10.1016/j.farsys.2024.100088>
- Bekele, G., Tadesse, K., & Hirpo, M. (2021). Informal livestock marketing and pastoral livelihoods in the Horn of Africa. *Pastoralism: Research, Policy and Practice*, 11(1), 87–103.
- Bucini, G., Clark, E. M., Merrill, S. C., Langle-Chimal, O., Zia, A., Koliba, C., Cheney, N., Wiltshire, S., Trinity, L., & Smith, J. M. (2023). Connecting livestock disease dynamics to human learning and biosecurity decisions. *Frontiers in Veterinary Science*, 9. <https://doi.org/10.3389/fvets.2022.1067364>
- Bucini, G., Rulli, M. C., & D’Odorico, P. (2023). Market integration and food security in pastoral communities of Sub-Saharan Africa. *Food Policy*, 118, 102531.

- Can, M. F. (2023). A cluster analysis on the potential of livestock farming: Türkiye in a global context. *Tropical Animal Health and Production*, 55(5), 338. <https://doi.org/10.1007/s11250-023-03761-7>
- Cheng, M., McCarl, B., & Fei, C. (2022). Climate Change and Livestock Production: A Literature Review. *Atmosphere*, 13(1), Article 1. <https://doi.org/10.3390/atmos13010140>
- Chima, A. V. (2023). Agricultural marketing and economic growth in Nigeria. *BW Academic Journal*, 1(1), 13–13.
- Duncan, A. J., Ayantunde, A., Blummel, M., Amole, T., Padmakumar, V., & Moran, D. (2023). Applying circular economy principles to intensification of livestock production in Sub-Saharan Africa. *Outlook on Agriculture*, 52(3), 327–338. <https://doi.org/10.1177/00307270231199116>
- Eeswaran, R., Nejadhashemi, A. P., Faye, A., Min, D., Prasad, P. V. V., & Ciampitti, I. A. (2022). Current and Future Challenges and Opportunities for Livestock Farming in West Africa: Perspectives from the Case of Senegal. *Agronomy*, 12(8), Article 8. <https://doi.org/10.3390/agronomy12081818>
- Gebremedhin, B., Gizaw, S., & Tegegne, A. (2021). Livestock market structure and performance in Ethiopia: Implications for policy and practice. *Ethiopian Journal of Agricultural Sciences*, 31(2), 71–89.
- Georges, M., Charlier, C., & Hayes, B. (2019). Harnessing genomic information for livestock improvement. *Nature Reviews Genetics*, 20(3), 135–156. <https://doi.org/10.1038/s41576-018-0082-2>
- Gowane, G. R., Kumar, A., & Nimbkar, C. (2019). Challenges and opportunities to livestock breeding programmes in India. *Journal of Animal Breeding and Genetics*, 136(5), 329–338. <https://doi.org/10.1111/jbg.12391>
- Guyo, D. M., Kero, C. A., & Kant, S. (2024). Livestock Marketing Effect on Pastoralist Community's Economic Status in Ethiopia: Mediation by Market Intermediaries. *International Journal of Social Science, Management and Economics Research*, 2(1), Article 1. <https://doi.org/10.61421/IJSSMER.2024.2104>
- Gwaka, L., & Dubihlela, J. (2020). The Resilience of Smallholder Livestock Farmers in Sub-Saharan Africa and the Risks Imbedded in Rural Livestock Systems. *Agriculture*, 10(7), Article 7. <https://doi.org/10.3390/agriculture10070270>
- Igirisa, I., Rahman, M., Abdussamad, J., Abdusamad, Z., Husain, A. K., & Suparman. (2020, December 1). *Implementation of Development Policy for Livestock Farming Business in Gorontalo Regency, Gorontalo, Indonesia*. EBSCOhost. <https://openurl.ebsco.com/contentitem/gcd:156331710?sid=ebsco:plink:crawler&id=ebsco:gcd:156331710>
- Kitole, F. A., & Sesabo, J. K. (2022). Smallholder Livestock Keepers' Breeding Choices and Its Implication on Poverty Reduction in Developing Countries: Empirical Evidence from Tanzania. *Global Social Welfare*, 9(4), 241–251. <https://doi.org/10.1007/s40609-022-00252-9>

- Lado, P., & Aguto, R. (2024). Institutional frameworks and livestock sector reform in South Sudan: Pathways for inclusive growth. *South Sudan Development Review*, 5(1), 33–51.
- Latino, L. R., Pica-Ciamarra, U., & Wisser, D. (2020). Africa: The livestock revolution urbanizes. *Global Food Security*, 26, 100399. <https://doi.org/10.1016/j.gfs.2020.100399>
- Lovarelli, D., Bacenetti, J., & Guarino, M. (2020). A review on dairy cattle farming: Is precision livestock farming the compromise for an environmental, economic and social sustainable production? *Journal of Cleaner Production*, 262, 121409. <https://doi.org/10.1016/j.jclepro.2020.121409>
- Marshall, A. (1890). *Principles of economics*. Macmillan.
- Mukherjee, S. (2020). *A guide to research methodology: An overview of research problems, tasks and methods*. CRC Press.
- Munyua, S., & Muriithi, B. W. (2021). Market access and commercialization among smallholder livestock producers in East Africa. *African Journal of Agricultural and Resource Economics*, 16(2), 145–160.
- Neethirajan, S., & Kemp, B. (2021). Digital Livestock Farming. *Sensing and Bio-Sensing Research*, 32(1), 1-14. <https://doi.org/10.1016/j.sbsr.2021.100408>
- Njuki, J., Poole, E., & Baltenweck, I. (2022). Inclusive livestock market development in Africa: Pathways to sustainable rural transformation. *World Development Perspectives*, 26, 100415. <https://doi.org/10.1016/j.wdp.2022.100415>
- Paul, B. K., Groot, J. C., Maass, B. L., Notenbaert, A. M., Herrero, M., & Tiftonell, P. A. (2020). Improved feeding and forages at a crossroads: Farming systems approaches for sustainable livestock development in East Africa. *Outlook on Agriculture*, 49(1), 13–20. <https://doi.org/10.1177/0030727020906170>
- Rubino, R., Sepe, L., Dimitriadou, A., & Gibon, A. (2023). *Livestock farming systems: Product quality based on local resources leading to improved sustainability*. BRILL.
- Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. W. Strahan and T. Cadell.
- Todaro, M. P., & Smith, S. C. (2020). *Economic development* (13th ed.). Pearson.
- Wanyoike, S., Mutua, E., & Bett, B. (2023). Digital livestock trading platforms and market integration in East Africa. *Frontiers in Sustainable Food Systems*, 7, 1102304.
- Wekesa, C., Njiru, J., & Omondi, J. (2020). Gender inclusivity and participation in livestock value chains in Kenya. *International Journal of Rural Development*, 45(3), 201–214.
- Woldemichael, A. D., Lemma, Z., & Gebremariam, S. (2023). Livestock value chain integration and rural income growth in sub-Saharan Africa. *Journal of Rural Studies*, 101, 45–57. <https://doi.org/10.1016/j.jrurstud.2023.02.008>
- Worthington, B. (2017, June 2). Australian agricultural aid agencies contributing to the global effort to eradicate hunger. *ABC News*. <https://www.abc.net.au/news/2017-06-02/global-food-security-south-sudan-syria-united-states-australia/8582944>
- Yoseph, M., Lemu, B., & Abebe, G. (2023). Cooperative models for livestock market development in Ethiopia. *Development Policy Review*, 41(4), 669–687.