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Mapping the Red Meat Market System to Inform Pastoral Livestock Breeding Programmes in Kenya

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Abstract

Arid and Semi-Arid Lands (ASAL) in Kenya host nearly 75% of the national ruminant population and contribute to over 80% of domestically consumed beef, yet productivity and profitability remain low due to recurrent droughts, disease burdens, and inadequate feed quality and availability. Despite growing market opportunities, structural inefficiencies, limited infrastructure investment, high transaction costs, and weak actor integration undermine the beef sector. Using a market systems development framework which treats markets as multi-actor arrangements of core exchange functions, supporting services (inputs, infrastructure, and service provision), and an enabling environment (standards, regulations, and norms), this study assessed the inclusivity and performance of the red meat market-system in Kenya's ASAL. Participatory market-system mapping with 50 representatives across the value chain identified the actors, the system blockages affecting each actor group and their root causes. Results illustrated a high multiplicity of actors concentrated within the core value chain, weakly linked, which limited coordination. The actor map comprised; six actor groups in the enabling environment, six in the core value chain (condensed from 19 sub-actor categories), and five providing supporting services. Limited capacity of livestock producers, notably pastoralists, emerged as the primary systemic blockage affecting all actor groups, followed by insufficient capacity to meet demand for inputs, services, and technologies, inadequate financing of market actors, and weak policy frameworks and compliance mechanisms. Together these bottlenecks create systemic inefficiencies that limit market integration, value addition, and overall sector performance. Integrating market system insights into the design of livestock breeding and genetic improvement programmes may help improve pastoralist livestock productivity, suggesting that stakeholder mapping could be a useful first step toward sustainable transformation of pastoral red meat systems in Kenya.

Keywords: markets, pastoralism, livestock, value chains, breeding

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Introduction

The livestock sector plays a fundamental role in the Kenyan economy, contributing about 12% of the national GDP and 40% of the agricultural GDP and employing half of the agricultural labour force (Kenya Markets Trust, 2019a; Bahta et al., 2023). Arid and semi-arid lands (ASAL) in Kenya cover approximately 80% of the land area, support more than 20% of the national population, and account for approximately 75% of the ruminant livestock population. These landscapes contribute more than 80% of domestically consumed red meat, highlighting their importance to the economy and food security (Kenya Markets Trust, 2019a). Despite their economic significance, ASALs remain among the country's most economically vulnerable and climate-exposed areas. Livestock production in these systems is constrained by recurrent droughts, disease burdens, and limited availability and poor-quality feed. These challenges impede herd recovery, resulting in persistently low productivity and profitability and undermining household resilience. Repeated climatic shocks lock pastoral households into cycles of asset loss and recovery, limiting their ability to restore livestock productivity and accumulate productive assets (Nyariki & Amwata, 2019; Yanda et al., 2023). Pastoralism, a dominant livelihood system in ASALs, directly supports approximately 20 million people, contributes US$1.13 billion annually to the national economy and generates wider economic opportunities through livestock value-chain activities (Nyariki & Amwata, 2019). However, the economic potential of pastoral livestock systems remains constrained by structural weaknesses in the markets within which they operate, including limited access to reliable market information and services, inadequate infrastructure, and high transaction costs. These structural constraints reduce the returns producers obtain from livestock production and limit their ability to respond effectively to growing market opportunities. These challenges are particularly important in the context of projected population growth, with the Kenya National Bureau of Statistics estimating that the national population will reach 96 million by 2050, alongside increasing demand for animal-source foods as consumers seek nutrient-rich and diversified diets (FAO, 2019). In this context, targeted, market-oriented livestock interventions have been identified as a strategic pathway to strengthen livestock production and market performance, meet the rising demand for animal-source foods, enhance food and nutrition security, and improve pastoral livelihoods (Bahta et al., 2023).

The International Livestock Research Institute (ILRI), through the CGIAR Sustainable Animal and Aquatic Food Systems (SAAF) and Multifunctional Landscapes (MFL) programmes, seeks to strengthen the adaptive capacity and resilience of pastoral communities through developing and testing evidence-based innovations in livestock productivity, market access, breeding, service delivery and inclusive support systems. These efforts aim to increase household incomes, improve food and nutrition security, protect livestock assets and reduce dependence on relief assistance. Achieving these outcomes, however, requires a clearer understanding of how the wider red meat market system functions and how different actors interact within it. This study assessed the inclusivity and performance of the red meat market system in Kenya's ASAL using a market systems analysis framework. This study sought to (i) understand and map the red meat value chain and the functioning of its market system; and (ii) identify the key systemic constraints and underlying root causes affecting value-chain actors.

Material and Methods

A participatory market-systems approach was used to assess the structure and functioning of the red meat market system in selected pastoral regions of Kenya. Fifty stakeholders were purposively selected based on their involvement in, knowledge of, or influence on the value chain, representing livestock producers, aggregators, traders, processors, consumers, input and service providers, and institutional enablers. Facilitated participatory sessions were conducted to map market actors, their roles and relationships, core market functions, supporting inputs and services, and the enabling environment. Stakeholders identified and prioritized systemic

bottlenecks affecting different actor groups and analyzed their underlying root causes. Data was documented using structured notes, stakeholder maps, group worksheets, and prioritization matrices. Thematic analysis was used to characterize market-system dynamics, categorize the bottlenecks and their root causes, and synthesize stakeholders' assessments of their importance and influence on overall market performance.

Results and Discussions

Structure and functioning of the red meat market system

Participatory market-system mapping identified three interconnected components of the red meat market system comprising the enabling environment, core value chain, and supporting services (Figure 1). Six actor groups were identified in both the enabling environment and core value chain, alongside five groups providing supporting services. The core value chain encompassed 19 sub-actor categories covering production, aggregation, trading, processing, retailing, and consumption. Although the large number of actors reflects the structural complexity of the red meat market system, this did not necessarily translate into effective coordination among them. Instead, the mapping revealed weak and poorly defined linkages, particularly between core value-chain actors and supporting service providers. These gaps hindered information exchange, access to services, and coordination across value-chain nodes, and were associated with high transaction costs and limited resource flows. It was evident that constraints in the red meat sector extend beyond individual actors and market functions to the relationships connecting them. The information generated underscores the value of a market-systems perspective, which recognizes that performance depends not only on transactions between livestock producers and traders but also on interactions among supporting services and the broader institutional environment. Weak linkages across components may perpetuate systemic bottlenecks even where individual actors and services are present.

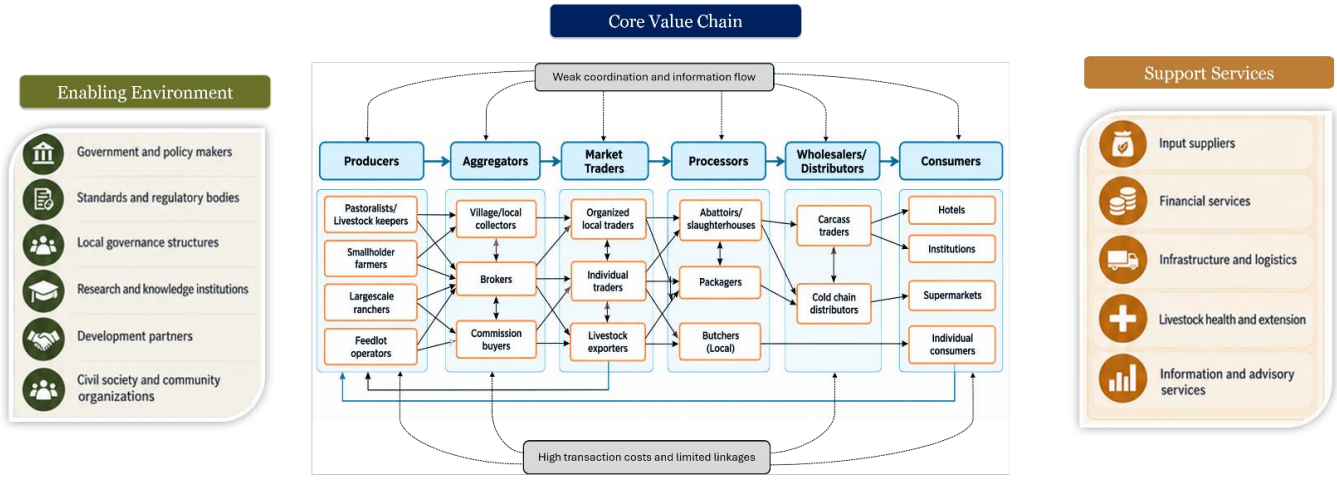


Figure 1: Map of the red meat market system, showing core market functions, supporting services, enabling institutions and relationships among actors

Systemic blockages and root causes

Limited capacity among livestock producers was identified as the major system-level blockage, linked to four interrelated factors: socio-cultural and gender barriers, limited knowledge and skills, weak information systems, and limited collective action. These factors constrained access to inputs, technologies, services, finance, and market information, potentially limiting producers' ability to improve production and respond to market demand. Participants reported that gender norms restrict access to resources and decision-making, while limited collective action weakens

bargaining power and opportunities for coordinated marketing. These findings point to the need to address both producer capabilities and the wider conditions shaping market participation. Other blockages included inadequate capacity to meet demand for livestock inputs, services, and technologies; limited financing across market actors; and weaknesses in policy implementation and compliance. Participants indicated that limited financing restricts service provision, while weak information systems impede coordination and informed decision-making, and that weak policy implementation increases uncertainty and discourages investment. Collectively, these bottlenecks suggest that limited market access, inadequate services, and low productivity may be associated with interconnected information, financial, institutional, and relational weaknesses across the market system.

Pathways for improving market-system performance

The stakeholders identified stronger coordination among market actors as a key pathway towards improving the inclusivity and performance of the red meat market system. Priority actions included strengthening the capacity and collective action of the actors, improving access to inputs, services, technologies, finance, and market information, and enhancing policy implementation and compliance. Stakeholders further emphasized the need for sustained multi-stakeholder engagement, feedback, and adaptive learning to support collective problem-solving and responsive interventions, particularly in pastoral systems. These findings suggest that coordinated interventions strengthening relationships among market actors and supporting institutional conditions are needed to improve system-wide performance.

Conclusions and Outlook

Improving the performance of Kenya's red meat market system will require interventions that address systemic bottlenecks and strengthen linkages among market actors. The findings suggest the need to strengthen actors' organizations and collective action, expand access to livestock inputs, animal health and breeding services, finance, and reliable market information, and improve policy implementation and institutional linkages. Strengthening information exchange and market linkages could improve transparency and align production with market demand. Livestock breeding improvement programmes would benefit from integrating market-system evidence to align breeding objectives with market requirements and the production realities of livestock keeping communities. Aligning breeding, production, service delivery, and marketing interventions may help address constraints across the value chain and support a productive, resilient, and inclusive red meat sector.

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