

An Audit of Constraints and Opportunities in Kenya's Livestock Export Value Chain

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Abstract: For a long time Kenya has desired to access lucrative export markets for her livestock products. Although this desire matches the growing global demand for livestock products and increasing interest in livestock products from Kenya by livestock deficient countries, Kenya has not been able to meet the expressed demand. The reasons for this failure have not been sufficiently documented. This study used the value chain approach to assess and document the factors that limit Kenya's export trade in livestock. Questionnaire interviews were undertaken with livestock producers, traders, processors and importers. Producers cited livestock diseases, poor roads, drought, livestock theft and insecurity as the main constraints to livestock supply. Livestock traders mentioned high cost and delays in obtaining movement permits, rent-seeking and disturbance by government officials along the stock routes as some of the constraints. Processors on the other hand mentioned Kenya's failure to meet the international sanitary requirements. The only importer interviewed indicated that trade restrictions, Kenya's inability to control livestock diseases and distance were the main constraints to increased livestock trade with Kenya. Stakeholders in Kenya's livestock export value chain should address these and other constraints in order to revitalize this vital sector.

Key words: Livestock export trade, value chain analysis, Kenya.

1. Introduction

Among the retinue of economic activities available to the residents of Kenya's arid and semi-arid lands (ASALs), livestock keeping is the most important. These areas constitute over 80% of Kenya's land mass and are characterized by low and erratic rainfall, and fragile and infertile soils. These conditions make ASALs uncondusive for any meaningful arable crop production. However, these conditions confer ASALs with the unique advantage of producing livestock based on natural pastures with minimal use of purchased inputs. Livestock in these areas are mainly of indigenous type and are highly adapted to variable

disease, pasture and water constraints. Collectively, ASALs cater for about 70% of the national livestock herd [1]. The fact that almost all of ASALs' livestock are free ranged on natural pastures provides a unique opportunity for producing "organic" livestock products that are increasingly being sought after in international markets.

For a long time, Kenya has demonstrated its desire for accessing the lucrative export markets for its livestock and livestock products. This emanates from the nostalgia of the 1970s and early 1980s when the Kenya Meat Commission (KMC) was the premier processor and exporter of beef and other meat products to various international markets. Since then, Kenya's livestock exports have been on a downward trend with a 10 year hiatus of no export between 1995 and 2004 (Fig. 1). This is in spite of the expected

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growth in demand for livestock and livestock products worldwide attributable to rising incomes, urbanization and population growth [2]. Ironically, although there have been notable efforts by livestock deficient countries to access livestock imports from Kenya, the country has not been able to meet the expressed demand. In fact, over the years, Kenya has been unable to supply the 4,000 metric tons of beef quota to the European Union thereby losing over KShs 0.5 billion each year. This scenario raises the question as to why this has been the case.

Whereas some of the factors that have hindered export trade in Kenya's livestock and livestock products are well known, these have not been succinctly documented; indeed, most are scattered in many stakeholder documents and grey literature. In addition, no study has so far examined the constraints to trade in livestock and livestock products from Kenya's marginal areas from an export value chain perspective. This is in spite of the fact that because these areas have surplus livestock, exports enlarge the market for livestock producers, what Myint [3] refers

to as a "vent for surplus". Identifying export trade constraints at each step of the export value chain is a first step towards identifying goal-oriented remedial measures at each level of the chain in an effort to promote livestock trade. Additionally, it is important to establish and document barriers to export trade in Kenya's livestock and livestock products and to generate information that policy makers and other stakeholders could use to promote trade in order to recapture Kenya's lost share of the international market. Finally, focusing on the livestock export value chain could provide information to policy makers and interest groups on where interventions are most needed as well as give an indication of the magnitude of the impact of such interventions. This study aims to fill this gap.

The Government of Kenya considers livestock keeping as an important economic activity that can be used as an instrument for promoting equity and poverty reduction goals particularly among the livestock keeping communities in ASALs. Currently, Kenya's livestock sector contributes about 12% to the

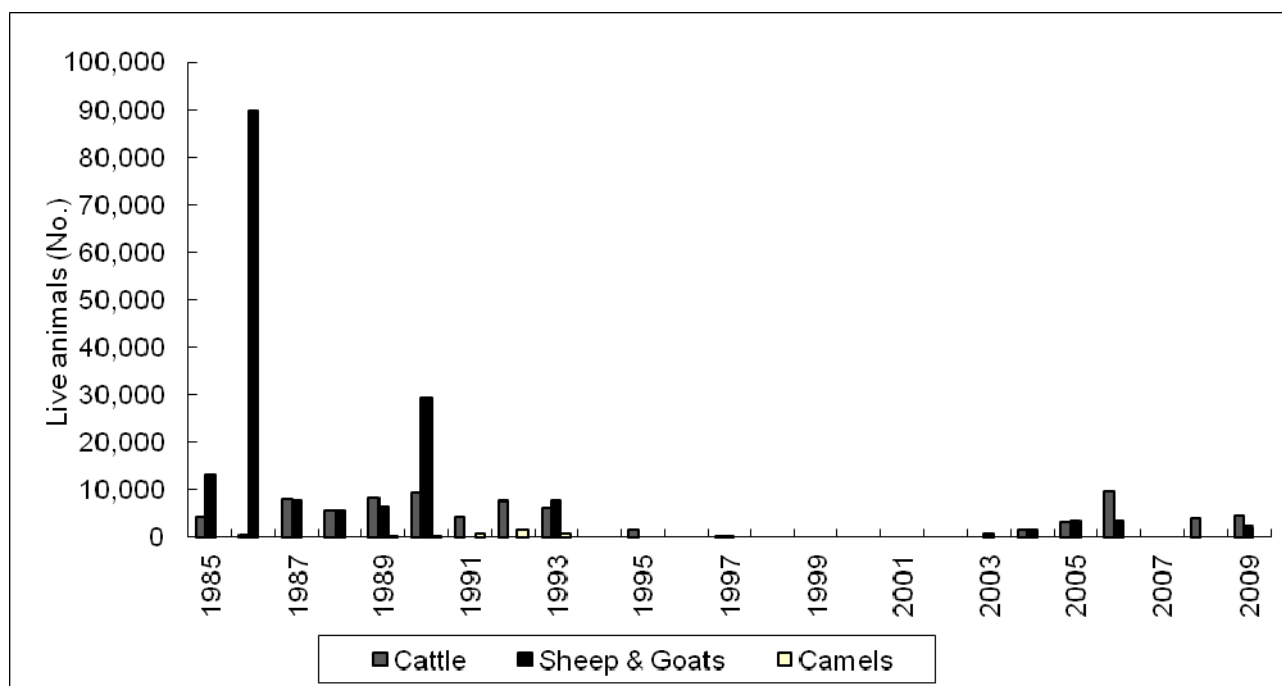


Fig. 1 Exports of livestock from Kenya (1985-2009).

Source: Department of Veterinary Services (various reports).

N.B. In 2009 exports are upto October.

GDP and 40% to the agricultural GDP [4]. Kenya's Vision 2030 identifies agriculture as one of the key sectors that will enable the country to achieve the 10% annual economic growth rate under the economic pillar. To achieve this, the transformation of smallholder agriculture from subsistence farming to a commercially-oriented and modern agricultural sector is critical. With regard to livestock, the government envisages that the sector will contribute to poverty alleviation by addressing the Millennium Development Goal number one. In the current ASAL Development Policy [5], the Government of Kenya recognizes the role of livestock in exploiting the potential of ASALs through conversion of the natural forage into usable products for subsistence as well as for sale. By so doing, livestock are expected to pull out of poverty the over 60% of the ASAL population that lives below the international poverty line of less than a dollar a day.

Studies show that almost all Kenyan households invariably keep at least one livestock species and that livestock ownership constitutes a critical first rung on the ladder out of poverty [6]. The necessary step to enabling livestock keepers reap the full economic benefits from their livestock is to diversify the marketing of livestock through export promotion. At the moment, this is hindered by the constraints that this study endeavors to unravel using the value chain concept. It is hoped that the information generated by this study will help improve the competitiveness of Kenya's livestock to enable the country recapture its lost share of the international market. At the current times of globalization and change, the understanding of the dynamics of the constraints that confront the livestock export value chain is critical in promoting success factors for competitive performance at the international market.

2. Materials and Methods

2.1 The Value Chain Concept

Genova et al. [7] define a value chain as the set of

activities undertaken in the management of the flow of goods and services along the value-added chain in order to realize superior customer value at the lowest possible cost. The industrial organization theory describes a value chain as the set of activities within and around an organization and relates them to the competitive strength of the organization. In this sense, firm managers use value chain analysis (VCA) to gauge the competitiveness of the firm. In the field of marketing, VCA is used to evaluate the value-added of commodities from the point of production to the point of final consumption. In this way, VCA measures the efficiency of price transmission at each stage of the chain. Value chain analysis can also be used in tracing product flows, showing the value adding stages, identifying key actors and their relationships with other actors in the chain [8]. In this way VCA reveals the bottlenecks in the value chain for remedial action.

As such, the VCA is a heuristic concept which is devoid of either a unified antecedent theoretical construct or hard rules in application. All that is required is that goods/services flow along the production-consumption continuum. The evaluation of relationships, operational activities and strategic behaviors of firm managers (producers), traders, processors, conveyors and consumers within the continuum are the hallmarks of the value chain paradigm. As such, the value chain concept is premised upon many interacting theories of human behavior including game theory, bargaining and agency theory as well as transaction cost theory and institutional and organizational theory [9]. It has been studied under disparate perspectives, disciplines and research areas. Giannakis and Croom [10] asserts that the literature on value chains is so patchy and unconnected that it has not been easy to adequately define the term. Additionally, the majority of published work in VCA has largely been descriptive in nature, adding little to its conceptual and theoretical development. Nonetheless, the value chain concept

offers a solid foundation for strategic positioning, policy setting and decision making [9]. Its application in a study such as this one can offer important insights on value chain phenomena in a developing country context.

In this study, VCA was considered a suitable methodological tool to identify the key constraints hindering the expansion of export trade in livestock and livestock products from Kenya. Taking Kenya as a typical firm and livestock and livestock products as the traded commodity and importers as consumers of the traded commodity, the study sought to answer the question: what constraints impede the efficiency and effectiveness of Kenya's livestock export value chain in delivering superior value to its customers at the least cost? A key reason why countries that produce primary products (such as Kenya) do not make significant headway in the export business is their failure to understand what drives their ability to leverage on their value chains to deliver superior value to their customers. In recent years, firms have increasingly recognized the importance of closely aligning their operations and value chain strategies with the needs of customers to increase the efficiency of the value chain cost effectively. It would be therefore reasonable to assume that there is a positive relationship between the extent to which producers of primary products (such as Kenya) consider and manage value chain issues and their success in export trade. We believe that examining the entire livestock export value chain for Kenya is crucial in understanding the export market dynamics which would help in designing effective and efficient strategies to redress identified constraints.

The literature on agricultural commodity value chains often depicts the chain as the flow of goods/services from the producer to the consumer (Fig. 2). Following the neoclassical tradition, a livestock production system transforms a set of inputs (e.g., breeding stock, land, labor, feed, etc.) into a given level of livestock products (e.g., live animals, milk, meat, manure, fibre, etc.), contingent upon the objectives of

the livestock keeper [11]. The outputs so realized change hands between various actors (indexed 1 to n in Fig. 2) after which such outputs are available for sale in either domestic or international markets and eventually to final consumers. The actors could be middlemen, brokers, traders, processors or conveyors of raw materials (e.g., live animals, manure, hides and skins), intermediate or finished products along the value chain.

In the Kenya's marginal areas livestock producers are invariably pastoralists and ranchers from whom brokers, middlemen and traders purchase products for conveyance to either domestic or external markets. Some traders sell to processors, e.g., Farmers Choice, Alpha Fine Foods, KMC and tanneries (in case of hides and skins) for value addition [12]. Eventually, processors export either semi-finished or finished products to external markets (Fig. 2).

2.2 Study Design

Following the value chain approach and based on the three commonly used measures of market performance, namely, product quality, competitive position and customer service level, the research team identified the following as the key players in the Kenya's livestock export value chain: producers (pastoralists and ranchers), traders, processors and importers.

With regard to producers, the study targeted pastoralists in Garissa and Ijara Districts of North Eastern Province (NEP). For a long time NEP has been Kenya's major source of export livestock [12]. Ranchers were derived from Laikipia District. The main traders were located in Garissa livestock market while processors included export slaughterhouses in cities of Nairobi and Mombasa. Only Mauritius was involved as an importer because it was the only country that purchased Kenyan livestock at the time of the study.

2.3 Data Collection and Analysis

One hundred and fourteen respondents comprising

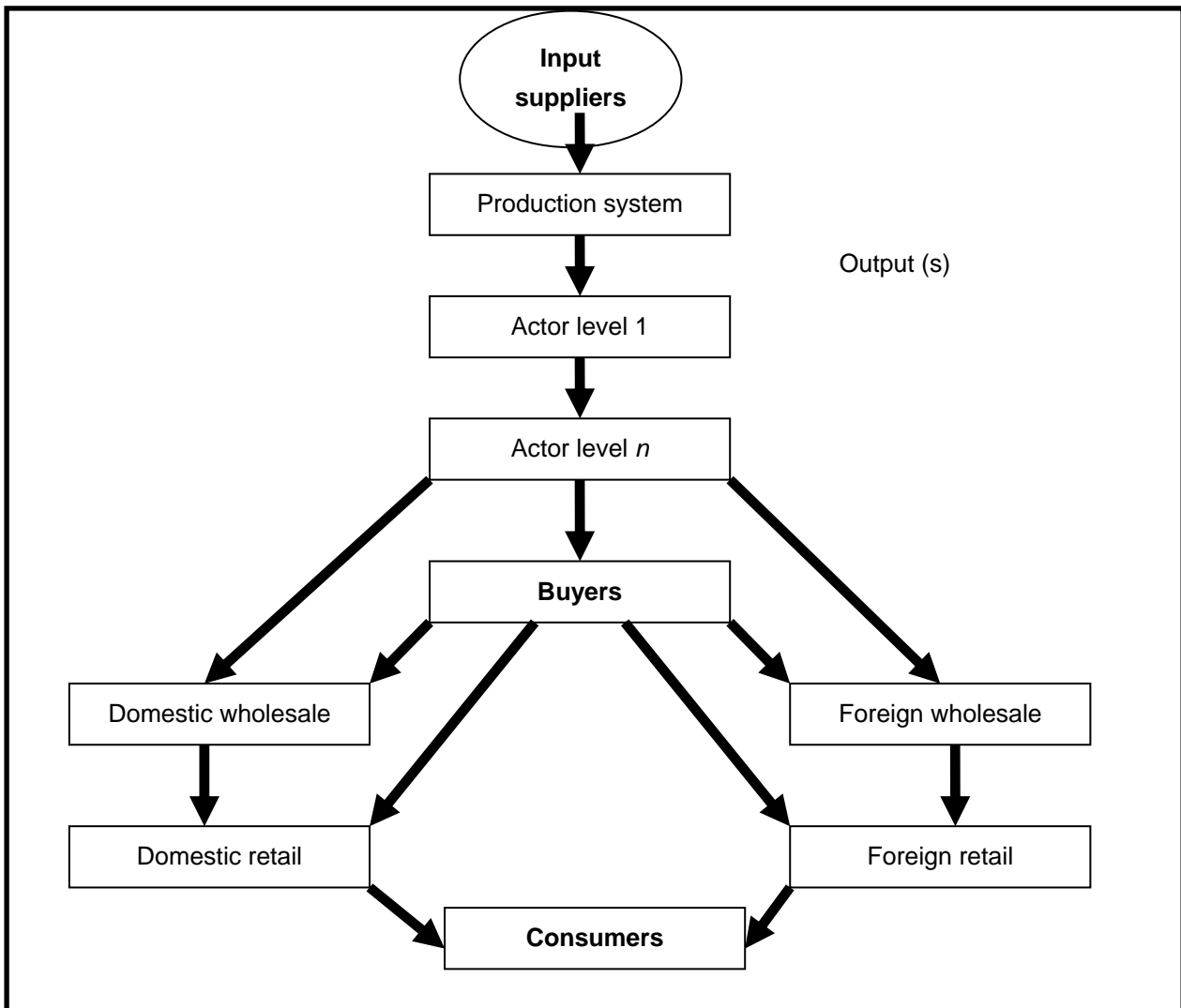


Fig. 2 A schematic view of the basic components of a value chain.

Source: adapted from Ref. [13].

54 pastoralists from Garissa District and 60 livestock keepers from Ijara District were randomly selected from a sampling frame constructed with the help of the Local Administration. Seventeen ranches in Laikipia District were engaged in livestock production at the time of the study. However, only four ranches, which are herein labeled 1 to 4 for confidential reasons, responded to our request for an interview. A total of 32 livestock traders in Garissa livestock market were interviewed. We interviewed five processors namely, Hurlingham export slaughterhouse, KMC, Farmers Choice Ltd., Alpha Fine Foods Ltd. and Mombasa slaughterhouse. As mentioned earlier,

only Mauritius was involved as an importer of Kenyan livestock products at the time of the study.

All the identified respondents were interviewed using a pre-tested structured questionnaire tailor-made for each group of respondents. For instance, producers' questionnaire had sections on farmers' information (age, gender, education level, family size, etc.), herd size, offtake, disease profiles, whether or not they produced for export and constraints to livestock marketing. The ranchers' questionnaire focused mainly on the nature of the business, product type, herd size, offtake, whether or not they produced for export and constraints to livestock export. Traders'

questionnaire enquired about individual trader's personal information (age, gender, education, etc.), sources of livestock sold, weekly sales volumes, mode of transport to and from the market, whether or not they exported livestock and constraints to the export business. The processors' questionnaire focused on the nature of the business, challenges in livestock exports and volume, nature and destination of livestock exports during the 12 months preceding the survey.

The data gathered through these interviews were captured in MS-Excel and analyzed in Statistical Analysis System (SAS) [14]. Descriptive statistics involving computation of means, frequencies and cross-tabulations and simple correlation techniques were used in data analysis. Where necessary, means were compared using a *t*-test.

3. Results

3.1 Pastoralists

3.1.1 Respondents' Socio-economic Profiles

Only one out of the 60 household heads interviewed in Ijara District was female. In Garissa District, 38 (representing 70.4%) of the 54 household heads were male. The average age of a household head was 50.3 years and 44.3 years for Ijara and Garissa Districts, respectively (Table 1). The household head's livestock keeping experience averaged 42.5 years and 30.3 years respectively for Ijara and Garissa Districts. Ijara District had significantly larger families compared to Garissa District ($P < 0.05$).

Most (81.7% household heads in Ijara and 61.1% in Garissa District) had no formal education (Fig. 3). Garissa District had a significantly higher number of

household heads who had attained primary and secondary school education than Ijara District ($P < 0.05$).

Fifty-one (85%) household heads in Ijara District were exclusively livestock keepers (Table 2). Another seven (11.7%) heads were both livestock keepers and livestock traders while the rest two (3.3%) kept livestock in addition to running other businesses. In Garissa District, 38 (70.4%) household heads were pure livestock keepers, 15 (27.8%) were livestock keepers/traders and one (1.9%) was a retired civil servant.

Table 3 shows livestock keepers' access to various livestock-based amenities, namely, roads, markets and animal health service providers (e.g., agrovet shops, government vets and animal health assistants). In both Garissa and Ijara Districts, access to animal health providers and markets was prohibitively low, being characterized by distances above 19 km on average.

3.1.2 Livestock Holding

Marketable livestock species kept by pastoralists in the two districts included cattle, sheep, goats and camels (Table 4). The size of cattle herds was similar among pastoralists in both districts ($P > 0.05$). However, pastoralists in Garissa District kept significantly larger herds of goats and camels than those in Ijara District ($P < 0.05$). Surprisingly, none of the pastoralists interviewed in Garissa District kept sheep.

3.1.3 Livestock Diseases

Fig. 4 shows the diseases reported by pastoralists in Ijara District. Trypanosomosis was most frequently reported followed by contagious bovine pleuropneumonia

Table 1 Respondents' socio-economic profiles.

District	Variable	N	Mean	Std. error	Range
Ijara	Age (Years)	59	50.3	1.8	20-84
	Livestock keeping experience (Years)	57	42.5	2.1	17-80
	Family size (Number)	55	8.0	0.6	2-24
Garissa	Age (Years)	51	44.3	2.2	15-80
	Livestock keeping experience (Years)	51	30.3	2.2	2-90
	Family size (Number)	52	5.7	0.9	1-30

Source: survey data.

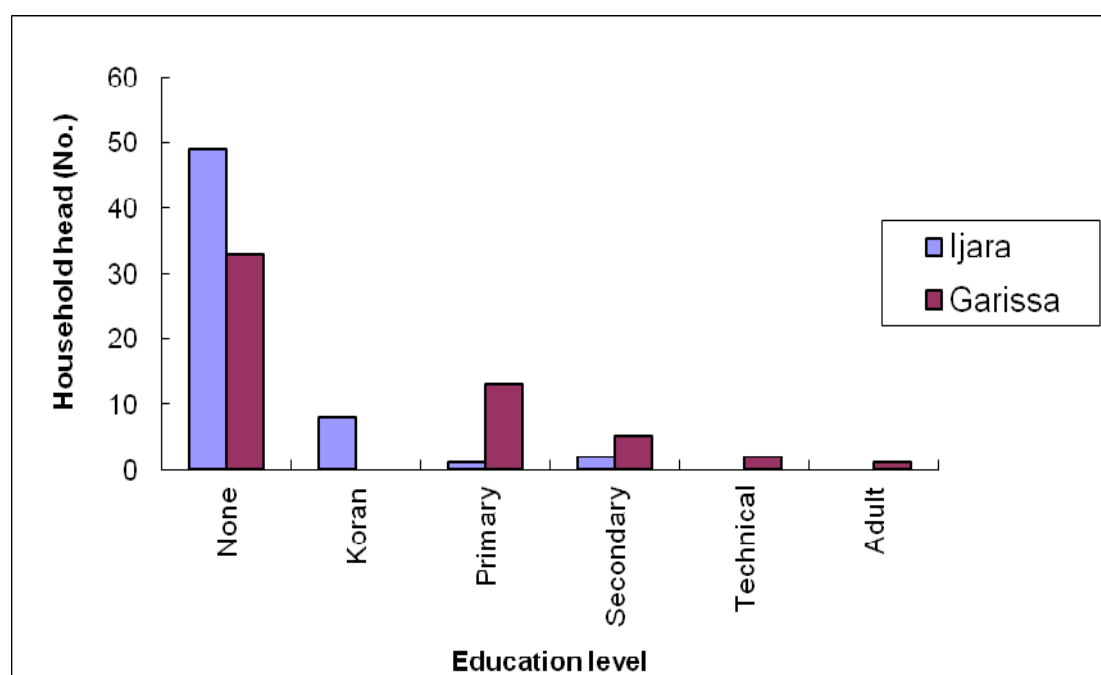


Fig. 3 Education level of respondents in Ijara and Garissa Districts.

Source: survey data.

Table 2 Livelihood sources of respondents surveyed in Ijara and Garissa Districts.

Livelihood source	Ijara District		Garissa District	
	<i>n</i>	Percent	<i>n</i>	Percent
Livestock keeping	51	85.0	38	70.4
Livestock keeping and trading	7	11.7	15	27.8
Livestock keeping and other businesses	2	3.3	-	-
Civil service (retired)	-	-	1	1.9

Source: survey data.

Table 3 Respondents' access to livestock-based amenities in Ijara and Garissa Districts.

District	Distance from homestead to nearest (km)	<i>n</i>	Mean	Std. error	Range
Ijara	Town	56	26.8	3.2	1-80
	Agrovet	54	47.1	6.4	2-320
	Animal health assistant	35	35.9	2.8	2-60
	Government vet	58	57.8	6.8	1-320
	Livestock market	58	41.9	7.3	1-320
	Trading centre	49	19.1	3.3	0.1-92
	All weather road	37	5.6	2.3	0.1-55
	Garissa	Town	54	25.3	3.6
Agrovet		54	36.8	6.4	1-180
Animal health assistant		47	32.8	4.7	1-120
Private vet		50	55.8	6.2	1-180
Government vet		53	62.4	6.7	1-180
Livestock market		54	48.3	6.4	1-180
Trading centre		53	36.2	5.6	0.5-180
All weather road		35	22.9	5.4	0.5-100

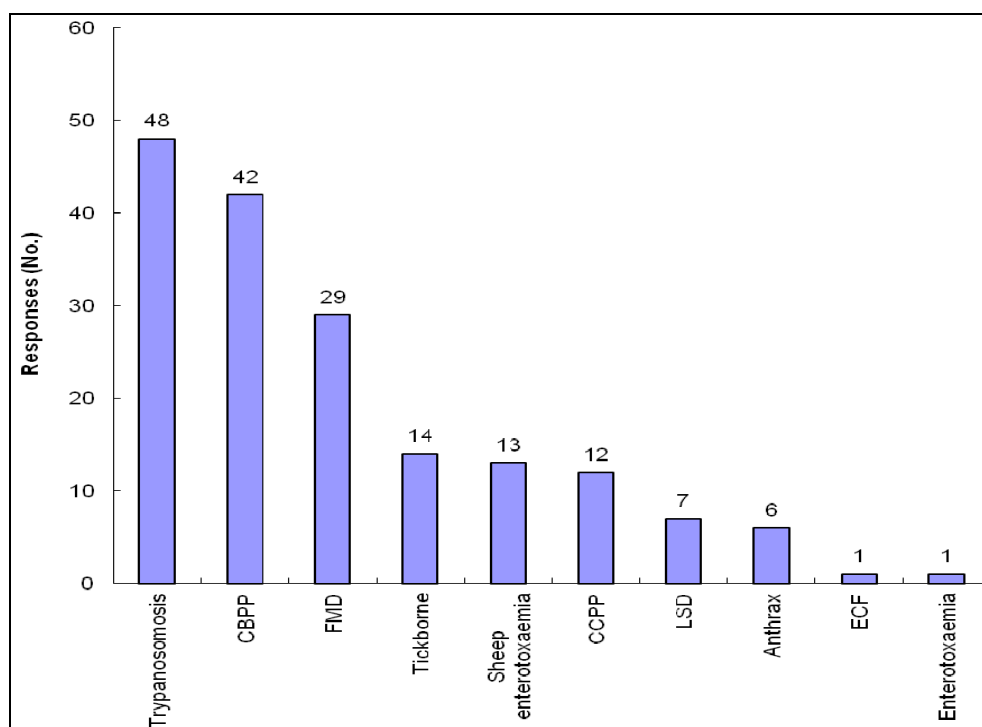
Source: survey data.

Table 4 Size of livestock herds kept by respondents in Ijara and Garissa Districts.

Species	Ijara District			Garissa District		
	<i>n</i>	Mean	S.E.	<i>n</i>	Mean	S.E.
Cattle	22	58.5	9.7	6	93	42.7
Sheep	47	38.5	6.7	0	-	-
Goats	43	42.2 [†]	6.1	26	70.4 [†]	14.8
Camels	9	5.2 [†]	1.0	5	19.8 [†]	6.1

Source: survey data.

[†]Significantly different means between the two districts ($P < 0.05$).

**Fig. 4** Frequency of livestock diseases reported by respondents in Ijara District.

Source: survey data.

(CBPP), *Madegeste* and foot and mouth disease (FMD) in that order. CBPP, *Peste des petits ruminants* (PPR) and anthrax were only mentioned to a lesser extent.

In Garissa District, FMD was the main livestock disease mentioned (Fig. 5). This was followed by lung disease, anthrax and contagious caprine pleuropneumonia (CCPP) in that order. Unlike the case of Ijara District where most respondents mentioned trypanosomosis, in Garissa District the disease was less frequently mentioned, implying that it was less common there relative to Ijara.

3.1.4 Marketing of Livestock and Livestock Products in the Domestic Market

Table 5 shows the mean number of livestock sold by

each household surveyed in Ijara and Garissa Districts during the year prior to the survey. Respondents in Garissa District on average sold significantly more goats than those in Ijara District ($P < 0.05$). The number of cattle and sheep sold by respondents in the two districts was not significantly different ($P > 0.05$).

Although on average respondents in Garissa District sold more milk than those in Ijara District, the volume was not significantly different in the two districts. Average milk prices were KShs 41.2 and KShs 35.6 in Ijara and Garissa Districts, respectively, but were not significantly different ($P > 0.05$). Little meat was sold by respondents in the two districts during the year prior to the survey (Table 5).

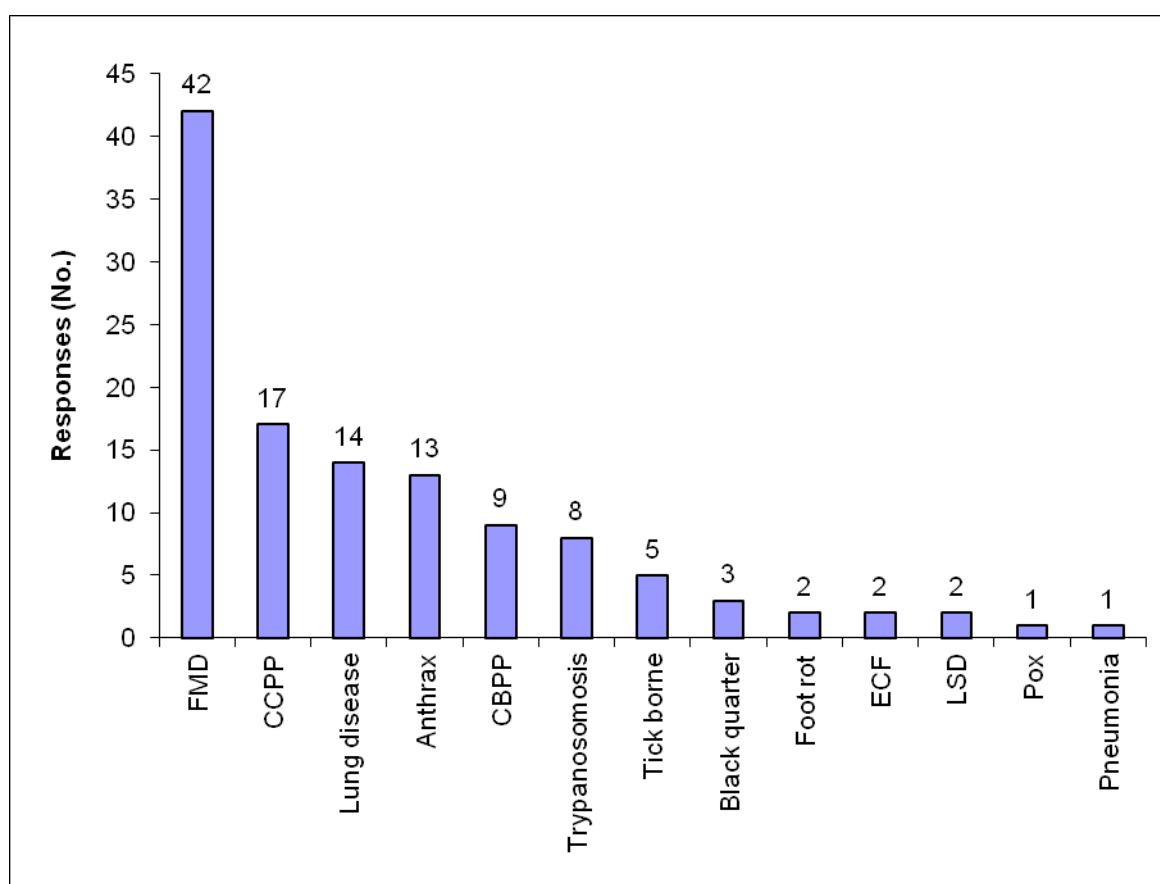


Fig. 5 Frequency of livestock diseases reported by respondents in Garissa District.

Source: survey data.

Table 5 Off-take of livestock and livestock products in Ijara and Garissa Districts.

Commodity	Ijara District			Garissa District		
	<i>n</i>	Mean	S.E.	<i>n</i>	Mean	S.E.
Cattle	54	20.3	9.2	29	16.1	3.8
Sheep	52	19.1	2.6	48	24.1	3.4
Goats	43	10 [†]	1.2	34	16.1 [†]	2.3
Milk (L)	23	630.8	162.6	37	773.1	366.8
Meat (kg)	1	200.0		13	89.1	54.4

Source: survey data.

[†]Means are significantly different between the two districts ($P < 0.05$).

In Ijara District, 29 respondents (58% of those who responded to the question) sold their livestock in the local (primary) market. Another 13 (26%) sold in Garissa (secondary) market while another seven (14%) sold their livestock to middlemen. Only one respondent produced livestock destined for the export market (Table 6). In contrast, 37 (78.7%) respondents targeted the Garissa livestock market while 10 (21.3%) sold their livestock in the local market. None targeted

the export market (Table 6). The main reason why pastoralists in Ijara prioritized the local market was because it was nearest to them. Likewise, the Garissa livestock market was deemed nearer to respondents residing in Garissa District.

3.1.5 Participation in the Livestock Export Market

Five respondents in Ijara District and 11 respondents in Garissa District had ever kept livestock targeted for the export market. In Ijara District, one

Table 6 Target livestock markets by respondents surveyed in Ijara and Garissa Districts.

Target market	Ijara District		Garissa District	
	<i>n</i>	Percent	<i>n</i>	Percent
Local	29	58	10	21.3
Garissa	13	26	37	78.7
Middlemen	7	14	-	-
Export	1	2	-	-
Total	50	100	47	100

Source: survey data.

respondent had ever exported livestock to Mauritius while another two targeted neighboring countries. In contrast, of the 11 respondents in Garissa District who had ever exported livestock, four had sold to Dubai while another two had exported to both Dubai and Egypt. Of the other five respondents, one had exported to Dubai and Tanzania, another to Dubai and Uganda, another to Mauritius and Egypt and the other to Tanzania.

3.1.6 Constraints to Livestock Marketing in the Domestic Market

Pastoralists identified a multitude of constraints that limit livestock marketing in their locales. In Ijara District, respondents cited low prices as the most important constraint followed by long distance to market and lack of market in that order (Fig. 6). Other constraints included livestock diseases, poor roads, lack of transport and general insecurity. In Garissa District, long distances to market and lack of market featured prominently as the most important livestock marketing constraints. These were followed by low prices, poor markets and drought (Fig. 6).

3.2 Ranchers

3.2.1 Livestock Holding in the Ranches

Of the four ranches interviewed, three were privately owned while one was publicly owned through the Agricultural Development Corporation (ADC). The latter has a branch at the Coast Province, one of the biggest ranches in sub-Saharan Africa. The average acreage of the four ranches was 60,900 acres with a range of 16,000 to 90,000 acres. Table 7 shows the livestock population in the four ranches at the time

of the survey. Cattle accounted for 86% of the total livestock population. Ranch 3 specialized in cattle production, accounting for 47% of all the cattle kept in the four ranches. On the other hand, Ranch 1 was the only one that kept camels. In the three ranches that kept shoats, sheep were more preferred than goats.

3.2.2 Constraints to Livestock Production

The main constraints to livestock production in the four ranches included drought, livestock theft (through rustling), diseases, wildlife menace, illegal grazing and high taxation by the government.

3.2.3 Marketing of Livestock in the Domestic Market

As expected, the main livestock products produced in ranches included live animals and meat (beef, mutton and chevron). Table 8 shows the number of livestock sold in the domestic market by the four ranches during the year prior to the survey. Ranch 1 did not sell any livestock during the year while Ranch 3 accounted for 65% of the total cattle sales. Sale of sheep and goats was relatively low.

3.2.4 Participation in the Livestock Export Market

All the ranches were involved in export trade, albeit intermittently. However, the number of livestock exported was very low. For instance, Ranch 2 exported only 11 cattle in 1988 and 18 others 20 years later in 2008. Ranches 3 and 4 produced embryos for export to Tanzania, Uganda and South Africa. However, the number of embryos exported to these countries could not be established.

3.2.5 Constraints to Increased Export Trade in Livestock

The main constraint cited by ranchers as restricting the export of livestock and livestock products from the

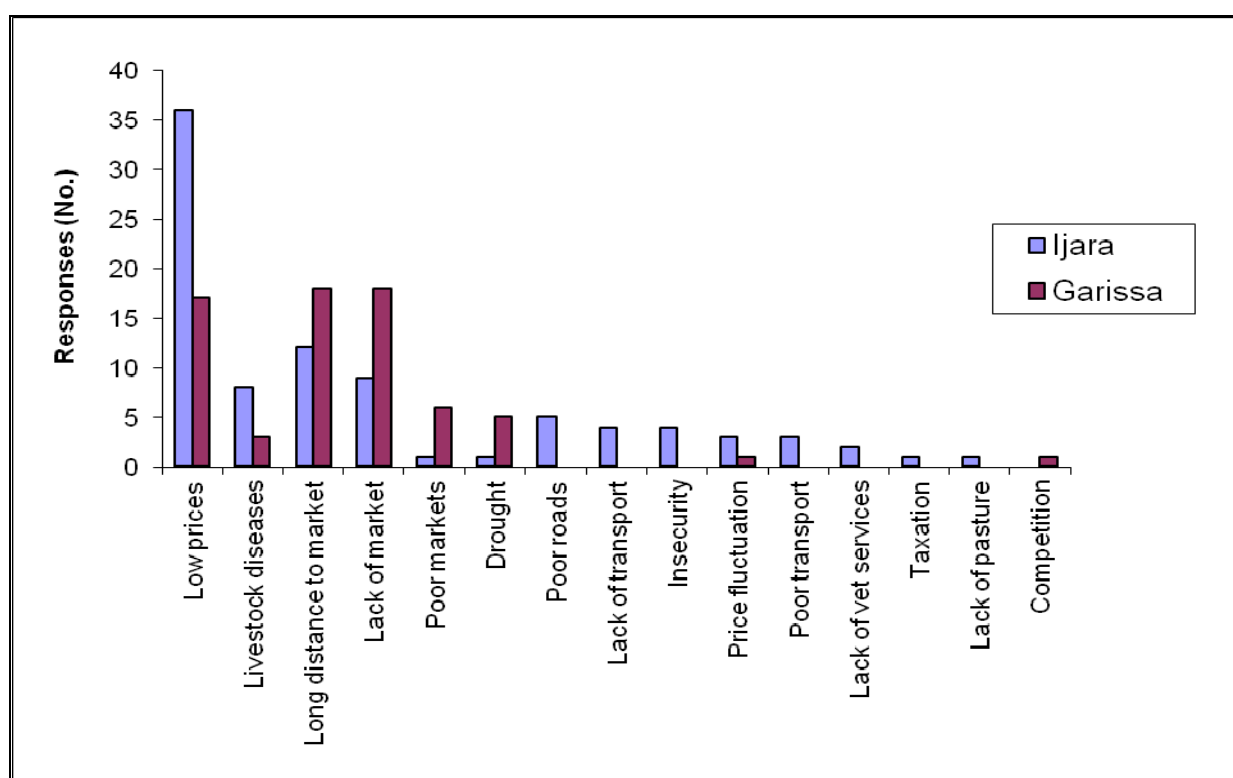


Fig. 6 Livestock marketing constraints cited by pastoralists surveyed in Ijara and Garissa Districts.

Source: survey data.

Table 7 Livestock population in the four ranches surveyed in Laikipia District.

Ranch	Cattle	Sheep	Goats	Camels
1	3,477	200	248	396
2	4,085	411	244	0
3	9,050	0	0	0
4	2,500	1,000	500	0
Total	19,112	1,611	992	396

Source: survey data.

Table 8 Number of livestock sold to the domestic market by the four ranches surveyed in Laikipia District.

Ranch	Cattle	Sheep	Goats
1	0	0	0
2	430	0	7
3	1,600	0	0
4	440	150	100
Total	2,470	150	107

Source: survey data.

four ranches was high disease prevalence. The main diseases included FMD, anthrax, brucellosis and rift valley fever (RVF). Other constraints hindering export trade in livestock and livestock products included poor organization of the export value chain, lack of finances to invest in disease control programs and

poor infrastructure.

3.2.6 Opportunities for Increasing Livestock Exports

Opportunities exist for increasing trade in livestock and livestock products from Kenya. For instance, the ranchers indicated that Kenya's Boran breed is highly preferred by consumers in Mauritius due to its high

beef quality and great taste. The demand for livestock exports was said to be high between November and December mainly due to Christmas festivities.

3.3 Traders in Garissa Livestock Market

3.3.1 Traders' Socio-economic Profiles

All the 32 traders interviewed in the Garissa livestock market were male. The average age was 42.8 years (range = 20-68 years). All the traders also kept livestock in their villages of origin. Most (65.6%) traders had no formal education. Table 9 shows the number of traders who participated in the sale of different livestock species. Most (68.7%) traders diversified their trade portfolio with 15.6% trading in all species of livestock.

3.3.2 Sources of Livestock Sold in Garissa Market

Traders sourced their stock within and outside Kenya from as far as Ethiopia and Somalia (Mogadishu and Kismayu) (Table 10). Garissa and Wajir Districts were the dominant livestock sources because of their proximity to the Garissa livestock market.

Of the 21 traders who responded to the question, only eight (38.1%) enquired about the vaccination record of the animal; the majority 13 (61.9%) did not. Even then, the traders who made the inquiry relied only on verbal evidence rather than documented proof of vaccination probably because most of them were illiterate.

3.3.3 Sales of Livestock in Garissa Market

Table 11 shows traders' weekly sales volumes. The table indicates a thriving trade in all species of livestock with cattle accounting for 42.2% of all livestock sold. However, the large standard errors and wide range in all cases are indicative of inconsistencies in reporting probably associated with recall memory. Interestingly, relatively fewer sheep were traded in comparison with the other species.

Slaughter houses and butchers within Garissa town accounted for 68% of the livestock sold weekly from the Garissa market (Table 12), followed by rearers

Table 9 Number of traders who participated in the sale of different livestock species at the Garissa livestock market.

Livestock species	Traders	
	<i>n</i>	Percent
Cattle	10	31.3
Cattle, sheep and goats	6	18.8
Sheep and goats	6	18.8
Cattle, goats and camels	3	9.4
Cattle and goats	1	3.1
Sheep, goats and camels	1	3.1
All	5	15.5
Total	32	100

Source: survey data.

Table 10 Sources of livestock traded at the Garissa livestock market.

Source of livestock	Responses	
	<i>n</i>	Percent
Garissa	23	34.2
Wajir	10	14.8
Modogashe	6	9.0
Somalia	5	7.5
Bura	5	7.5
Mandera	5	7.5
Tana River	4	6.0
Liboi	2	3.0
Dabley	1	1.5
Hagdera	1	1.5
Dujis	1	1.5
Ethiopia	1	1.5
Jalanko	1	1.5
Sabuli	1	1.5
Ijara	1	1.5
Total	67 [†]	100

Source: survey data.

[†]Total is greater than 32 because of multiple responses.

(14.9%), ranchers (7.9%) and feedlot operators (7.1%). Middlemen played a minor role in livestock marketing in Garissa market.

3.3.4 Destination of Livestock in Garissa Market

As expected, Nairobi and Mombasa were the major destinations for livestock traded at the Garissa livestock market as indicated by 20 and 14 respondents, respectively (Fig. 7). Ukambani (comprising Nguuni and Mwingi Districts) and Garissa District were the third and fifth destinations, respectively. Buyers from these areas mainly sourced replacement animals from the Garissa market.

Table 11 Weekly sales volumes in livestock in the Garissa market.

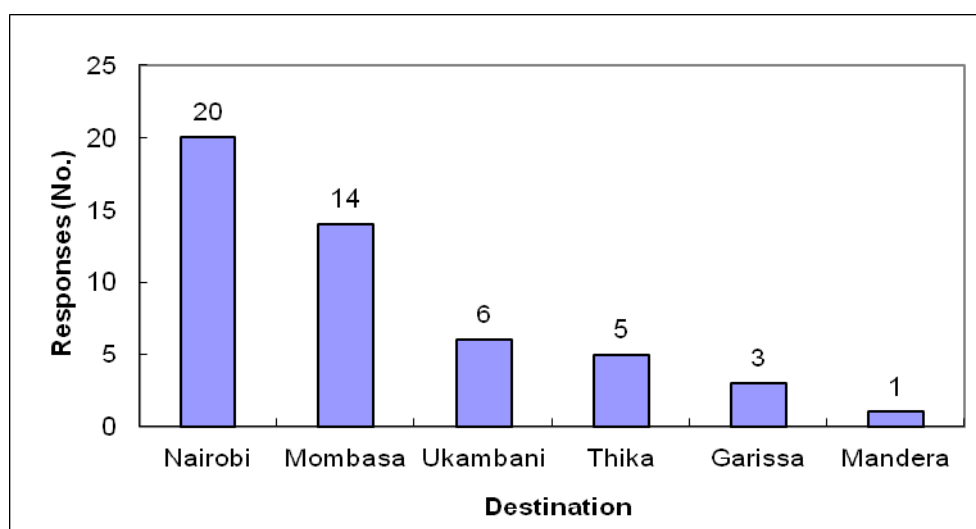
Species	Weekly sales (head)				
	<i>n</i>	Mean	Percent	Std. error	Range
Cattle	30	299.2	42.2	205.2	4-6,000
Goats	21	175.2	24.7	103.0	3-2,000
Camels	13	125.9	17.8	81.9	3-1,000
Sheep	20	108.3	15.3	59.1	2-1,200

Source: survey data.

Table 12 Weekly purchases by various buyers in Garissa livestock market.

Buyer	Weekly purchases (head)				
	<i>n</i>	Mean	Percent	Std. error	Range
Slaughter houses	20	161.5	47.3	52.7	1-1,000
Butchers	20	70.6	20.7	37.1	1-750
Rearers	20	50.7	14.9	19.7	2-400
Ranchers	9	27.1	7.9	12.2	4-120
Feedlot operators	15	24.1	7.1	6.2	1-70
Middlemen	14	7.4	2.2	2.9	1-40

Source: survey data.

**Fig. 7** Destination of livestock traded in Garissa market.

Source: survey data.

3.3.5 Handling of Livestock in Garissa Market

Most (60.6%) traders indicated that livestock from various catchment areas (sources) arrived at the Garissa market on hoof. Animals left the market to the next destination in trucks as reported by 95.9% of the respondents. If there were any sick animals in the purchased herd, 12 (46.2%) of the traders said they would treat them using either antibiotics, vaccines or dewormers (Table 13). If an animal died on the way from the market, four (16%) traders said that they burnt

Table 13 Type of remedies administered to sick animals in a purchased herd.

Remedy	Responses	
	<i>n</i>	Percent
Antibiotics	6	30
Vaccination	4	20
Dewormers	6	30
Acaricide	2	10
Quarantine	1	5
Call a vet	1	5
Total	20	100

Source: survey data.

the carcass, another 11 (44%) said they buried the carcass while another 10 (40%) said they left it to rot on the road.

3.3.6 Payments Made by Livestock Traders in Garissa Market

Table 14 shows the payments made for various transactions at the Garissa livestock market. The total payment per bovine was KShs 482 if the animal was destined for re-sale and KShs 532 if it was meant for rearing.

3.3.7 Participation of Traders in Livestock Exports

Out of the 24 traders in Garissa market who answered the question, 14 (58.3%) exported livestock. The major export destinations were Dubai, Tanzania and Mauritius (Table 15).

3.3.8 Awareness of Trade-Sensitive Livestock Diseases

Eight (40%) out of the 20 traders that responded to the question on disease awareness were aware of trade diseases which included FMD (reported by 50% of respondents), RVF (28.6%) and anthrax (21.4%). The respondents indicated that these diseases could be contained through vaccination (reported by 42.9%), quarantine (28.6%) and treatment (28.6%).

3.3.9 Constraints to Livestock Marketing in the Domestic Market

The main constraints to livestock marketing in the domestic market were high cost of movement permit (reported by two out of five respondents), disturbance by government (40%) and delays in obtaining the movement permit (20%).

3.4 Processors

3.4.1 Characteristics of Processors

Table 16 presents the particulars of the five

processors of livestock products interviewed. In terms of age, KMC is the oldest processor; Farmers Choice is the largest in terms of establishment while Mombasa slaughterhouse is the smallest processor.

At the time of the survey, only three of the five processors were exporting livestock products. Table 17 shows the volume of livestock products exported from Kenya in 2007 and the major export destinations. Although the quantities of products shown may not have come entirely from the five processors surveyed in this study, the data show significant export trade in pork, beef and poultry.

3.4.2 Constraints to Export of Livestock Products

Table 18 presents the constraints faced by livestock processors that hinder them from exporting livestock products which include (1) stringent SPS requirements (with a mean ranking scores of 4.4), (2) inadequate disease control in Kenya (mean score of 4.4), and (3) excessive legal requirements by importing countries.

Each processor perceived the constraints differently. Both Hurlingham and Mombasa slaughterhouses perceived the stringent SPS requirements and inadequate disease control in Kenya as the most pressing constraints while KMC perceived stringent SPS requirements, inadequate disease control and cultural and religious practices of importing countries as the most important. Farmers Choice prioritized trade restrictions in importing countries and inadequate disease control in Kenya. For Alpha Fine Foods, almost all the constraints were equally important (Table 18).

4. Discussion

Kenya has a long history of export trade in livestock

Table 14 Payments made in the Garissa livestock market.

Payment	Cattle	Sheep and goats
1. Movement permit	Up to 20 head = KShs 50 Up to 50 head = KShs 75 Above 50 head = KShs 100	Up to 100 head = KShs 50 Between 100-200 head = KShs 75 Above 200 head = KShs 100
2. Loading fee	KShs 160-200 per animal	
3. Auction fee	KShs 300 per animal	
4. CBPP screening charges (animals for breeding and fattening only)	KShs 50 per animal	KShs 50 per goat (goats only for CCPP)

Source: survey data.

Table 15 Export destination for livestock traded in Garissa market.

Export destination	Responses	
	<i>n</i>	Percent
Dubai	9	37.5
Tanzania	5	20.8
Mauritius	4	16.7
Uganda	2	8.3
Congo	1	4.2
Kuwait	1	4.2
South Africa	1	4.2
Sudan	1	4.2
Total	24	100.1

Source: survey data.

Table 16 Particulars of processors of livestock products in Kenya.

Processor	Year of establishment	Ownership	No. of employees	Products
Hurlingham slaughterhouse	1972	Local (private)	100	Beef, chevron, mutton, poultry, hides & skins
KMC	1950	Local (government)	400	Chevron, beef, mutton, hides & skins
Farmer's Choice	1975	Foreign (private)	1,000	Beef, pork, poultry
Alpha Fine Foods	1997	Local (private)	150	Beef, mutton, poultry
Mombasa slaughterhouse	2002	Local (private)	35	Beef, chevron, mutton, hides & skins

Source: survey data.

Table 17 Volume of livestock products exported from Kenya in 2007.

Product	Quantity (kg)	Unit price (KShs)	Major export destinations
Beef	23,688.4	423.0	Sudan, Somalia, Tanzania, United Arab Emirates, Ghana
Chevron/mutton	7,620.9	245.8	Sudan, Tanzania, United Arab Emirates, Somalia, Ghana
Offals	2,954.7	268.6	Sudan, Somalia
Pork	34,632.1	389.1	Sudan, United Arab Emirates, Bahrain, Tanzania, Uganda, Rwanda, Ghana, Ethiopia, Somalia
Poultry	10,704.9	356.8	Sudan, Somalia, Rwanda, Tanzania
Raw hides and skins	1,318.5	109.9	India, Singapore, Hong Kong

Source: KRA exports data (2008).

Table 18 Constraints cited by processors that prevent them from fully participating in the export trade in livestock products.

Constraint	Ranking [‡]					Mean ranking score
	Hurlingham slaughter house	KMC	Farmers Choice	Alpha Fine Foods	Mombasa slaughter house	
Unconducive government policy in Kenya	3	1	1	2	1	1.6
Stringent SPS requirements	4	5	4	4	5	4.4
Trade restrictions by importers	3	1	5	4	2	3.0
Unconducive political environment of importing countries	2	3	3	4	1	2.6
Excessive legal requirements by importing countries	3	3	3	4	4	3.4
Cultural and religious practices in importing countries	2	4	3	3	4	3.2
Inadequate disease control in Kenya	4	4	5	4	5	4.4
Communication barriers with importers	3	2	3	2	1	2.2
Mean score	3	2.9	3.4	3.4	2.9	

Source: survey data.

[‡]1 = not severe; 2 = severe; 3 = neutral; 4 = moderately severe; 5 = very severe.

and livestock products [15]. The main source of livestock for export has and continues to be the North Eastern Province where livestock are kept under a nomadic pastoral system. In this region, the pastoralists live on livestock products (e.g., milk, blood, and meat) and sell livestock when cash is needed or when necessitated by climatic conditions [16]. The pastoral production system faces numerous challenges including, as revealed by this study, low literacy levels (which compromises people's choices and confines them to pastoral-based livelihoods), high incidence of livestock diseases some of which are of a transboundary in nature (e.g., FMD, CBPP, CCPP and PPR), climate-related shocks (leading to environmental degradation), poor infrastructure (roads, telecommunication and social amenities), insecurity and lack of markets among others. With regard to climate change, it has been noted that Kenya experiences a severe drought every five years, which has put over five million Kenyans particularly in the ASALs permanently on relief food [17]. Additionally, the continued subdivision of both individual and group ranches [18] and increased influx of immigrants from the high potential areas to the ASALs have contributed to the decrease of livestock numbers in these rangelands to the extent that it is doubtful whether Kenya has enough livestock to satisfy the local leave alone international demand.

The presence of the transboundary animal diseases restricts livestock trade through trade bans caused by the failure of the country to meet the stringent international SPS standards developed by the OIE and regulated by WTO. These standards require that animals and products emanating from member countries be free from the former OIE's list A (or transboundary contagious) diseases, not only through lack of diagnosis of these diseases but also through the negative results of auditable surveillance data. In addition, livestock products should exhibit the maximum drug residue limits set by the FAO/WHO Codex Alimentarius [19]. Recent studies indicate that

livestock products contain violate levels of drug residues [20-22] including antibiotics [23-25]. Kenya's inability to sustainably control livestock diseases is the single most important factor limiting the access of the country's livestock and livestock products to the lucrative international markets, a fact clearly stated by ranchers, traders and processors interviewed in this study.

The orientation of pastoralists to keep livestock as their main source of food (milk, meat and blood) has important implications for herd structures and, consequently, for strategies to increase market off-take rates. Studies indicate that the average annual off-take rates in pastoral herds rarely exceed one percent [26], implying that the available supply of livestock in Kenya is far less than most government and development planners acknowledge. On the other hand, the supply response of pastoral livestock is negatively sloping particularly during times of good rains [27], which interrupts the smooth functioning of livestock markets and introduces ubiquitous price and market risks. Understandably, the apparent limited price responsiveness of pastoralists may result from livestock's multiple roles in response to the multiple institutional, infrastructural, and environmental obstacles the pastoralists face. However, the fact that livestock serve multiple purposes—some of which conflict with maximal herd off-take strategies to match demand—complicates pastoral marketing behavior [16]. Yet, the fixation of the pastoralist to build herds even when the market prices indicate otherwise is itself a rational economic and survival strategy given the vulnerability context, and the high economic returns from livestock relative to other economic opportunities in pastoral areas [28]. Barrett et al. [29] explain that livestock keeping is inextricably linked with food security such that the pastoralist would generally be unwilling to liquidate his animals to the point that the herd size may prove insufficient to ensure household food security in the face of unknown conditions in the future. This

contributes to low offtake, which compromises livestock export trade.

Although a myriad of challenges face livestock production and trade in pastoral areas of Kenya, all is not lost. First, the fact that the Kenyan livestock are mainly reared on natural pastures in a free range extensive production system presents an opportunity to brand and market our livestock products as “organic”. This is likely to fetch better returns for individual producers and traders, and consequently the country, by meeting the growing demand for organic products in high value markets in Europe, North America and other affluent nations. Such a market niche would offer less competition and better returns for Kenyan exports. Already, value addition to camel milk is proving such an attraction in both local and some export markets. Additionally, the superior taste of the Kenyan Boran as indicated by the ranchers interviewed in this study gives the Kenyan beef an edge over the competition, a fact which should be amplified through aggressive marketing campaigns.

Second, the Delgado “livestock revolution” is still beckoning [2]. As the human population, income and urbanization grow, so will be the demand for livestock and livestock products particularly in developing countries including Kenya. Recent data from the Economic Survey [30] indicate that the per capita incomes are rising in Kenya. The recent Housing and Population census data also show increasing population and urbanization, the latter growing by at a rate of 33% per year [31]. At the global level, the demand for “organic” products is rising. All these factors offer unrivaled opportunity for increasing livestock trade in Africa and particularly in Kenya. The challenge though is whether increased trade will improve the livelihoods of the poor who may not even have sufficient livestock to participate in trade [28].

Third, Kenya is undergoing unprecedented upgrading of its communication infrastructure. For instance, the Lamu Port South Sudan and Ethiopia (LAPSSET) project is underway, involving the

construction of the Lamu port, roads, a railway line, an oil pipeline and some international airports between Lamu and Turkana County. Additionally, there are proposals to construct export slaughterhouses in Garissa, Wajir and Lodwar. These efforts will definitely open up Northern Kenya and offer opportunities to livestock keepers to increase livestock trade through reduced transaction costs associated with inaccessibility and long distances to markets. The creation of disease free zones (DFZs), a flagship project under the Kenya's Vision 2030, is expected to overcome the perennial livestock disease problem to enable Kenya recapture its lost share of international export market of livestock and livestock products [32]. However, the viability of the DFZs given the need to protect wildlife-based tourism and biodiversity remains a conflicting policy issue.

Finally, Kenya continues to be a “magnet” for livestock from the neighboring countries. Conservative estimates indicate that about 50,000 head of cattle enter Kenya from Somalia, 100,000 from Ethiopia and 250,000 from Tanzania every year [12]. The attraction of animals from neighbouring countries is based on the fact that Kenya offers the highest livestock prices in the region. However, these livestock are often deemed “illegal imports” and are often excluded from official statistics [33]. Kenya could harness this trade by first of all officially recognizing these imports. It could then add value on the livestock imports *a la* Swaziland [34], either through fattening or further processing and branding and marketing them as Kenyan products. Of critical importance is to urgently take over, harness and develop the regional meat value chain.

5. Conclusions

This study sought to identify constraints and opportunities existing in the Kenyan livestock export value chain. The value chain concept was used as an analytical approach. The study shows that there are numerous challenges facing the export value chain

including livestock diseases, lack adequate livestock population to meet domestic and international demand, climate change effects, lack of markets, low market prices, and lack of veterinary services. Opportunities exist to promote livestock trade including the opening up of pastoralist areas in Northern Kenya via port, rail and road construction; creation of disease free zones and construction of export slaughterhouses in designated counties. Other opportunities exist in terms of the “organic” nature of livestock production in Kenya, the superior taste of Kenyan Boran and the effects of the “livestock revolution”. Addressing the constraints and taking advantage of opportunities offered by regional commodity value chains could raise the profile of Kenya's livestock export trade.

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