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Socio-economic characteristics and perceptions of cattle keepers and constraints to cattle production in Western Kenya

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Abstract

A cross-sectional survey was done in two Districts in Western Kenya to determine the socio-economic characteristics and perceptions of the cattle types kept. This involved socio-economic profiles of households, herd structure, reasons for keeping specific types of cattle and production and marketing constraints together with desired policy interventions to address the constraints. A total of 210 farmers randomly selected were interviewed. The data was analysed using Statistical Analysis System program. The majority of farmers (84%) were males. The households surveyed had an average family size of 8 (\pm 4.7) members.

The mean land holding was 7.8 acres, with 98% of them owning the land. Most of the farmers (64%) in the two districts were literate and were involved in farming (95%) as the primary livelihood. The majority (80%) of the households preferred keeping indigenous zebu cattle over the exotic cattle. The first three reasons for keeping zebu cattle were, in that order, work, especially ploughing (91%), milk (74%) and as a repository for wealth (32%), which accounted for about 62% of the respondents. Diseases (86%), inadequate and low quality feed (12%) and high cost of drugs (2%) were the major constraints to livestock productivity. The farmers also identified lack of market (48%), poor infrastructure (39%) and misuse by the middlemen traders (12%) as main marketing constraints. The survey showed that there is need for the effective implementation of policies on adequate financial aid and regulation of farm input prices to the farmers as well as improved livestock extension services to enhance the production of ruminant livestock.

Keywords: Constraints, livestock production, ruminants, western Kenya

Introduction

The role of livestock in human development is enormous. Protein from livestock is needed for physical and intellectual development as well as for developing immunity against disease. Livestock production is also an instrument to socio-economic change to improved income and quality of life. In Kenya, livestock provides about 36.5% of total protein intake but this still falls short of the minimum animal protein requirement recommended by FAO/WHO (2009). Livestock and crop farming are the major source of food production and income in rural farming. Livestock are also kept as a source of investment, insurance against disaster and also for cultural purposes (Rege et al 2001). The Kenyan government has, through extension programs, supported rural livestock farming by introducing modern farming practices. However, it seems more effort is required to improve livestock production for food security in these areas (Bebe et 2003, Mwacharo and Drucker 2005). The introduction of the Structural Adjustment Programme (SAP), a government policy of the 1990s, affected livestock

production in the country tremendously, since it led to liberalization and cost-sharing in provision of services within the livestock sector resulted in great challenges in securing adequate resources, developing strategic interventions for improvement and drafting supportive policies for the industry.

Apart from the Government policies, the problems of livestock production in developing countries are becoming more critical as population increases, demand elasticity is growing and the production systems still remain constrained by socio-economic and biological factors. With primary focus on animal husbandry/veterinary services, acknowledged socio-cultural factors as an appendage of major concern in seeking solution to problems facing livestock production is necessary. The indigenous knowledge, socio-economic situation and attitudes of the rural farmers should be taken into consideration when planning strategies for rural livestock improvement.

The population explosion, slow pace of development in certain sectors, suitability of different production systems to the existing environment, the preferences by farmers, need to be understood to attain the overall development in Livestock Sector (Rege et al 2001). Hence, an attempt was made to study the socio-economic and Livestock aspects of different production systems as these are the essential factors responsible for the Livestock development and with a view to formulate the relevant strategies for the development of Livestock sector. In the light of the above, this paper examines constraints affecting livestock production in some areas of western Kenya with an attempt to: Determine the socio-economic characteristics of farmers; Examine the livestock production constraints affecting ruminant livestock farmers; and Examine marketing constraints and the desired policy interventions by the farmers in the area.

Materials and Methods

Study area

The study was done in Teso and Suba districts in the Western part of Kenya. In each districts, three divisions were selected. The detailed description of the study areas was done by Thumbi et al 2010.

Survey design

This was done with the aid of a detailed structured questionnaire. Survey maps for every one of the sub-locations were created from ILRI's Geographical Information Systems (GIS) databases. Landmarks (any permanent feature like trading centers, schools or churches) were identified, marked on the maps for each sub-Location and used to make transects. From each district, three divisions were selected and from each division three villages were randomly selected. From each village, about 10-15 households were randomly selected for the survey. A total of 210 households were interviewed, 109 and 101 households in Suba and Teso Districts respectively. A map showing location of all households in which the survey questionnaires were administered are shown in Figure 1.

A comprehensive questionnaire was designed to obtain basic information about the households. Major sections of this questionnaire study were on characteristics of the households, characteristics of the livestock population and perceptions of the cattle keepers on breeds they keep, production and marketing constraints and possible policy interventions. The questionnaire was pre-tested in five households and necessary changes made to improve its clarity. Interviews were conducted by trained enumerators in the presence of the supervisors, between 25 September and 5 October 2006.

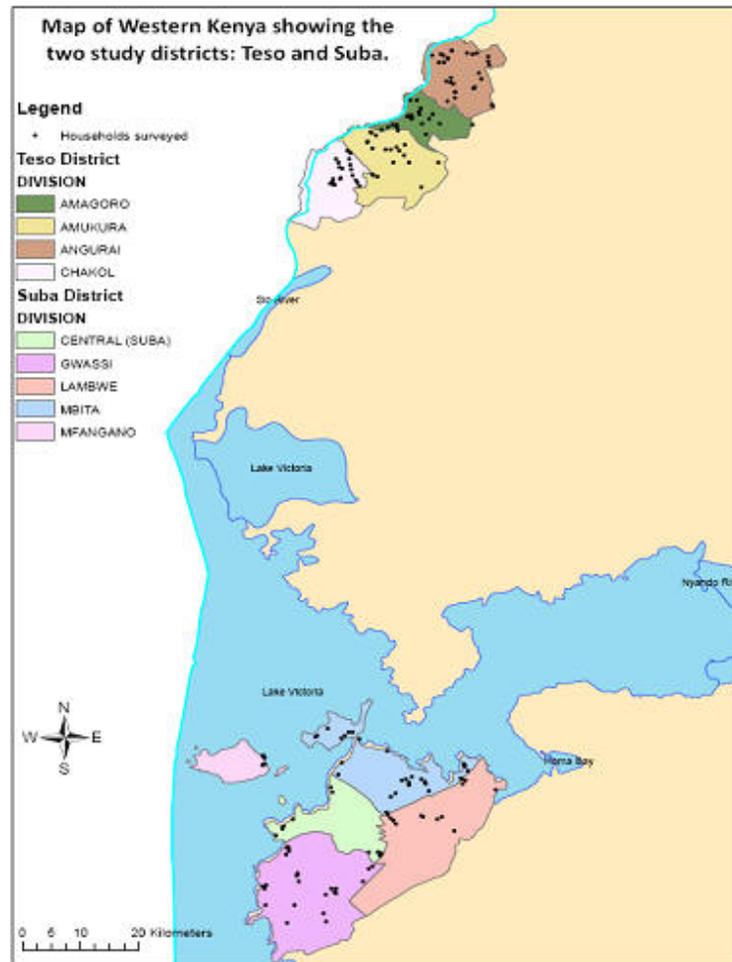


Figure 1: Map showing the study districts in Western Kenya and the location of all households that were surveyed.

Data analysis

Data collected were entered into a database in Microsoft Access 2007 (Microsoft Corporation, Redmond, USA). Maps were produced using the geographical information system software ArcView for Windows version 3.2 (ESRI Inc., Redlands, USA). The data obtained were analyzed using the Procedure Frequency in Statistical Analysis System (SAS 2003). Summary statistics were calculated to obtain a better understanding of the types of farmers, economical status of these rural communities, perception of the rural farmers on their cattle and constraints to cattle production.

Results and discussion

Socio-economic characteristic of respondents

The different socio-economic and personal characteristics such as socio-economic status, occupation, education, family type, land tenure and preferred cattle genotypes are presented in Table 1. Most households' heads were male (84%). Of women that headed households 65% were widowed. There were few households headed by females in Teso District (12%) compared to the 19.3% households headed by females in Suba. A larger proportion of respondents (38.8%) were between the ages 46 and 60, 27.7% were above 60 years, 25.4% were between the ages 31 and 45 and 8 % were less than 31 years old (Figure 2). This means that about 67% of the farmers in the surveyed districts were above 45

years old, an indication that livestock farming is common with the old people in these communities, this could be due to cultural issues in these communities.

Education empowers people, strengthens their abilities to meet their needs and increase their productivity and potential to improve their quality of life. More than half of the respondents (64%) have at least basic education (Table 1), with 15 % having post secondary education, 26% had secondary school education, and 23% had primary school education. The rest of the surveyed farmers indicated having no formal education. The level of the academic standard in this region was substantially higher. There was significant ($p < 0.001$) moderate positive correlation (0.37) between education level and average monthly income. This was also true for the correlation between education and no. of livestock kept and land owned.

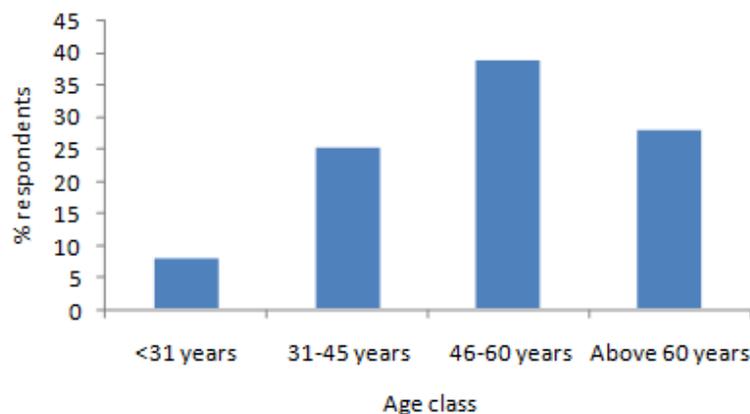


Figure 2: Age class of the farmers interviewed

Table 1: Distribution of socio-economic characteristic of respondents

	N	% respondents
Household type		
Single	7	3.33
Widow	18	8.57
Widower	4	1.9
Monogamous	102	48.6
Polygamous	79	37.6
Sex		
Male	177	84.3
Female	33	15.7
Education level		
No formal education	75	36.1
Primary education	48	23.1
Secondary education	54	26.0
Post secondary education	31	14.9
Main Occupation		
Farming	200	95.2
Livestock production/trade	2	0.95
Off-farm business	4	1.9

Formal employment	3	1.43
Informal employment	1	0.48
Land tenure		
Own	203	98.07
Lease	4	1.93

The majority of interviews carried out were with household heads. On average the family size was 8 (± 5) members, however, there was significant differences between districts as shown in Table 2 with Teso having higher family size per households (9 members). The average family monthly income was Kshs. 8677.95 (US \$ 115.7) but this differed between and within the districts surveyed as shown in Table 2 below. This indicated that most of the households income was about US\$ 4 per day, however, this excluded the cost of food consumed in the house which comes directly from the agricultural activities (crops and livestock) since the survey could not establish this.

Table 2: Average family size and monthly income for the respondents

District	Division	Family Size					Av. Monthly income				
		N	Mean	Std	Min	Max	N	Mean	Std	Min	Max
Suba		103	7.37	4.2	1	26	99	9594	7659	500	35000
Teso		98	8.71	5.1	1	25	96	7733	7288	500	36000
	Division										
Teso	Amagoro	24	9.08	6.46	2	24	23	10861	8919	1000	36000
	Amukura	48	8.21	4.47	1	25	46	6013	5407	500	18000
	Angurai	26	9.31	4.89	3	23	27	8000	7885	1000	36000
Suba	Gwasi	41	7.56	5.23	1	26	41	8854	7421	500	30000
	Lambwe	27	7.15	3.44	1	15	25	9292	7981	500	30000
	Mbita	35	7.31	3.39	2	17	33	10742	7803	500	35000
	Total	201	8.02	4.69	1	26	195	8678	7517	500	36000

Other socio-economic characteristics such as age, land holding and livestock numbers owned by respondents are presented in the Table 3. In the surveyed districts the average size of land held by each household was 7.8 acres, (range 0.25 – 35) with a coefficient of variation of 92.4% meaning that there were few individuals with large tracts of land, however, majority of the households (78%) had less than 10 acres of land. There was significant (<0.0001) moderate correlation (0.34) between the no. of cattle kept by the farmers and landholding

Table 3: Socio-economic characteristics of respondents in Western Kenya

Variable	N	Minimum	Maximum	Mean	Std	CV(%)
Age	201	16	89	52.7	15.0	28.4
Land holding	203	0.25	35	7.84	7.25	92.4
Cattle	150	1	33	8.49	7.00	82.4
Sheep	91	1	33	4.02	5.14	127
Goats	114	1	50	9.22	9.74	106
Pigs	129	1	52	9.49	8.92	94.1
Chicken	151	1	50	14.2	12.2	86.2

Herd sizes and composition

Livestock and livestock products are important components of agricultural output upon which many farmers depend for their daily livelihood. In this study all the sample households owned different types of livestock. All livestock keepers interviewed kept cattle in a multispecies enterprise (Table 4). The average herd size of cattle in the two districts was 10 heads, however, the average herd sizes differed significantly between the two districts i.e. 13.4 and 6.7 heads for Suba and Teso respectively. The composition of livestock species owned by farmers varied (Table 4), the most common was that of cattle, chicken and pigs owned by 23.8% of the farmers followed by that of Cattle, Goats and Chicken owned by 13.8% of the farmers. The combination of livestock owned in these rural farms was similar to other investigations conducted in other rural areas of Kenya (Mwacharo and Druckker 2005, Rege et al 2001). The results presented in Table 4 and figure 3 reflected that chickens were the most popular of the livestock in the two districts studied, followed by cattle and goats; however, the sheep were least popular livestock in both districts.

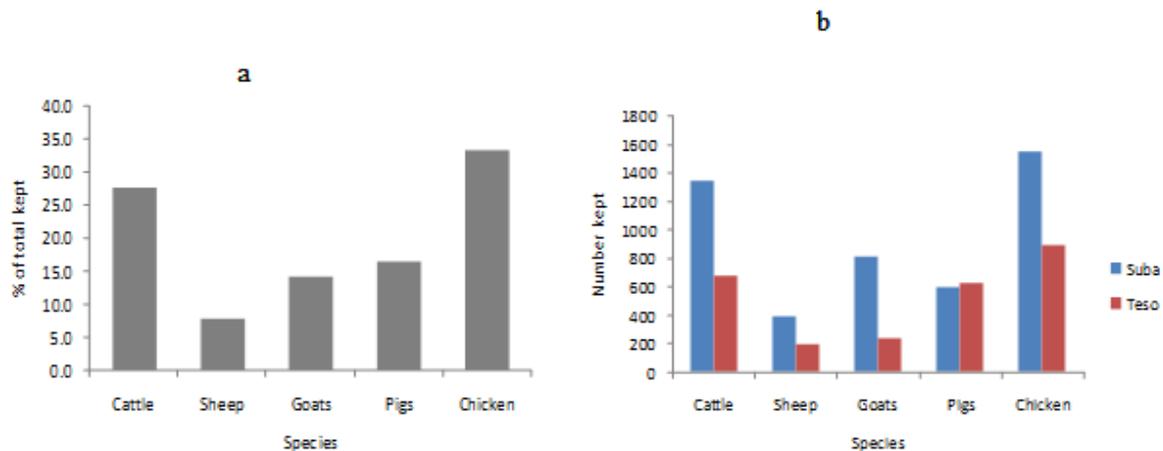


Figure 3a and 3b : Proportion of livestock species owned by the farmers in Suba and Teso Districts (a-combined data; b – each district)

Table 4 : Proportion of livestock types and combinations owned by farmers in Suba and Teso districts

Livestock species	Livestock numbers	% of Total Livestock	Combination of Livestock	% of Total Farmers
Cattle	2025	27.6	Cattle, Chicken, Pig	23.8
Sheep	581	7.9	Cattle, Goats, Chicken	13.8
Goats	1051	14.3	Cattle, Pig	13.8
Pigs	1224	16.7	Cattle, Sheep, Goats, Chicken, Pig	13.3
Chicken	2452	33.4	Cattle, Goats, Chicken, Pig	10.0
			Cattle, Chicken	5.7
			Cattle, Goats	5.7
			Cattle, Sheep, Goats, Chicken	4.3
			Cattle	2.9
			Cattle, Sheep	1.9
			Cattle, Sheep, Goats	1.9
			Cattle, Sheep, Chicken	1.4
			Sheep, Goats, Chicken, Pig	0.5
			None	1.0
Total	7333	100		100

The majority of the cattle owners had between 1 and 5 heads, similarly the common range in sheep, goat and pig ownership were between 1 and 5. Most chicken owners had between 1 and 10 chickens (Table 5). This indicated that the individual herd sizes in the studied areas are quite small and for breeding, almost all breeding males are sourced locally, implying that the relationship of animals within and between herds and even within the villages is potentially narrow and inbreeding may be widespread and increasing. This was also observed by Mwacharo and Drucker, 2005 in the South-Eastern part of Kenya

Table 5. Livestock types and number owned by the farmers in Teso and Suba Districts

Species	No. of livestock	No. of farmers	% of total farmers
Cattle	1-5	76	37.6
	6-10	53	26.2
	11-20	54	26.7
	>20	19	9.4
Sheep	1-5	73	78.5
	6-10	10	10.8
	11-20	6	6.5
	>20	4	4.3
Goats	1-5	55	48.3
	6-10	30	26.3
	11-20	14	12.3
	>20	15	13.2
Pigs	1-5	53	41.1
	6-10	35	27.1
	11-20	29	22.5
	>20	12	9.3
Chicken	1-10	79	51.3
	11-20	32	20.8
	21-30	27	17.5
	>30	16	10.4

Reasons for keeping cattle and preferences for specific breeds

Farmers were asked to give the reasons for keeping cattle and they gave several reasons (Figure 4).

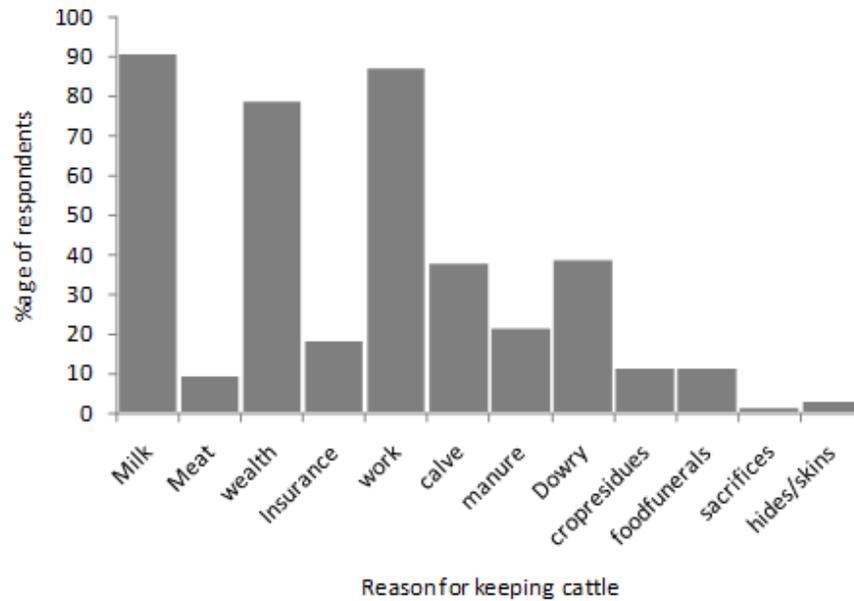


Figure 4: Reasons for keeping cattle in the two districts

From the ranking of reasons for keeping male cattle (Table 6), it can be seen that farmers keep these animals (in descending order of importance) for work (especially for ploughing), for milk, as a repository of wealth, sacrifices, source of manure, for meat production, as insurance, source of calves and for settling dowry payments among others. These results also confirm what was found by other authors (Rege *et al.*, 2001 and Mwacharo and Drucker 2005).

Table 6: Importance of reasons for keeping cattle

Reason	Importance ^a
Work	1.74
Milk	1.86
Wealth	2.48
Sacrifices	3
Manure	3.09
Meat	3.16
Insurance	3.16
Calves	3.55
Dowry	4.06
Crop residues	4.3
Food at funerals	4.35
hides/skins	4.5

^aThe importance rating is calculated using a weighted average of all rankings (including no ranking) of a particular reason. Lower numbers (minimum = 1) indicate higher importance

There were three types of cattle breeds owned and preferred in these areas (Figure 5). Most of the cattle farmers kept the Indigenous zebu breed because they are well adapted to the local environment and were resistant to many diseases especially trypanosomosis which is prevalent in these areas. Other farmers owned cross bred cattle for increased milk production. Only a few farmers kept the exotic dairy breeds for higher milk yields due to its intolerance of the local environment, high level of management and high feed requirement. This was also observed by Mwacharo and Drucker 2005 for

livestock keepers in South-Eastern Kenya

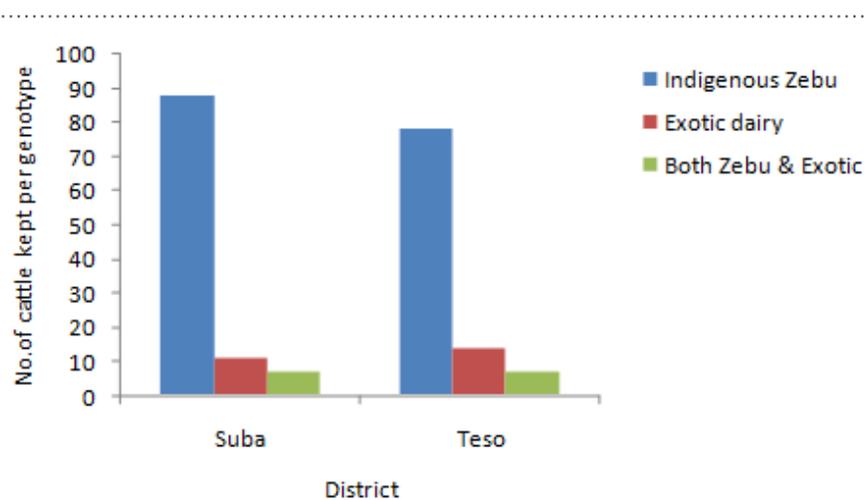


Figure 5: Preferred breed of cattle in the two surveyed districts

Production and marketing constraints to livestock keeping and preferred policy interventions

Production Constraints

Farmers were asked to indicate the most important constraints to cattle production and to prioritize them. Eighty-six percent of the farmers responded that diseases were the major problems in their cattle production activities causing mortalities and reduces production (Figure 6). The reason could be because the study areas is a tropical rainforest zone that favours growth of most of these diseases and vectors. Vectors and diseases have led to increases in cost of livestock production, according to the respondents. However, the increase in cost of production could be attributed to additional costs incurred in treating the sick animals, as well as cost of parasite and disease control to prevent epidemic outbreak. This is in agreement with Swai et al (2005), Ohaga et al (2007) and Chenyambuga et al (2008) who reported that the major cattle production constraints according to the order of importance are diseases, shortage of forages and water during the dry season, expensive veterinary drugs and lack of livestock market.

Lack of feed was also cited as a constraint to production especially during dry seasons. In both districts it was associated with lack of adequate grazing land due to subdivision of land. Therefore to achieve optimum carrying capacity farmers need to do one of the following. First, reduce the livestock numbers, however this approach is unpopular in the surveyed areas due to communal grazing. Secondly, livestock feed can be improved and increased through planting of fodder trees along the fences and on terraces. Since the farmers were using crop residues to supplement grazing they should also conserve feeds during wet and harvesting seasons to be used later. Thirdly, the productivity per animal can be improved through improving management, proper selection (breeding) and probably grading up. This is easier to implement because it is not expensive and may be agreeable to the farmers

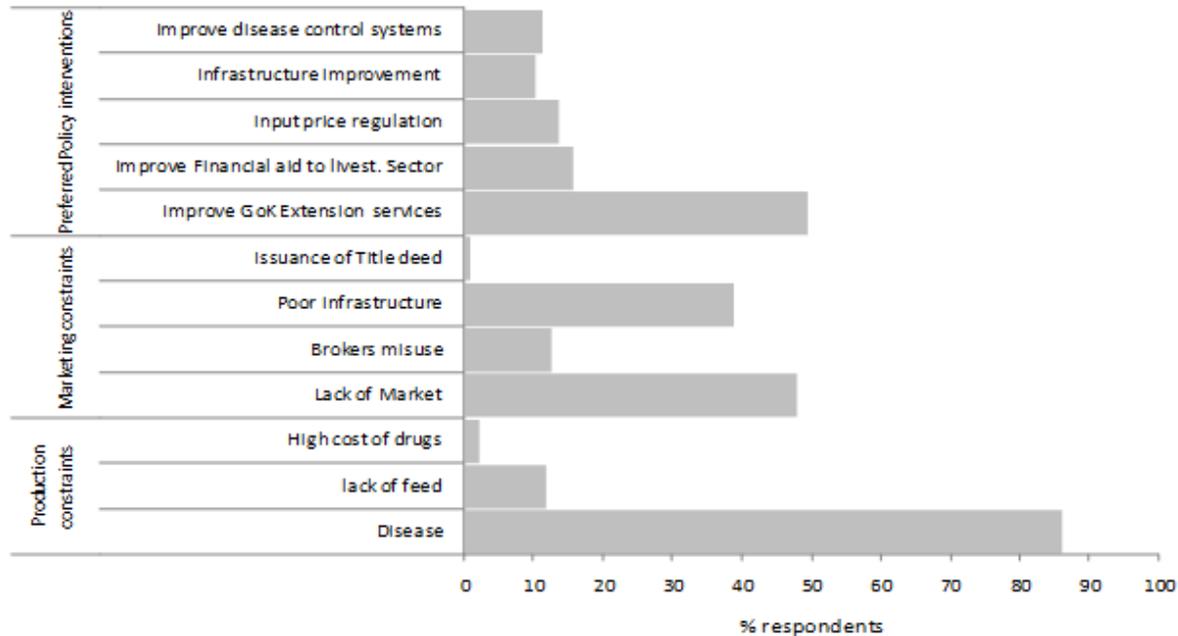


Figure 6: production and marketing constraints and policy interventions identified by the respondents

Marketing Constraints

Livestock is mainly sold at district level markets to livestock traders through brokers or middlemen as well as direct to livestock traders. Farmers identified several constraints to livestock market in these districts which were grouped into four (Figure 6), including lack of market access i.e. long distances to market, misuse by middlemen traders (brokers) by offering low prices for animals, poor infrastructure and issuance of land title deeds. The major concerns on marketing are poor roads which hinder transportation of the animals to the markets and livestock health delivery services. When it rains, some parts of these districts are completely cut off from the rest of the country. The animals have to travel long distances to the markets and in the process lose weight by the time they reach the markets.. The incidence of livestock diseases leads to quarantines, and restricted movement of animals hence the animals can not be sold. Some of the traders do not pay the livestock owners promptly hence the owners take time to realize the proceeds from the sale of the animals.

Most respondents reported that they do not have access to formal sources of credit such as bank loans since the banks need the security for loans and the farmers in these area may only have land as security, however some farmers (1%) cited issuance of title deeds to them as a constraint.

Preferred policy interventions

Farmers were also asked about the policy interventions they would prefer and majority (48%) preferred the improvement of government livestock extension services, this was followed by improvement of funding to livestock sector, input price regulation, improved infrastructure and improved disease control systems respectively (Figure 6). From this study it was evident that there was limited livestock extension services both from private and government sectors, hence farmers preferred policy intervention at this level. Since diseases were the major constraints to livestock productivity the farmers would like the government to have strong policy on disease control.

Breeding Implications

One aim of this study was to gather information that would be useful in the future when developing breeding programs for improved trypanotolerance. With particular respect to the optimization and extension of a breeding programme in western Kenya, the following considerations were important. Firstly, individual herds in the study areas were quite small (Table 5) and, for breeding, almost all breeding males are sourced locally (either from their respective herds or from nearby markets (data not shown)). Secondly, pasture and water resources are used communally and breeding animals stay in the herds for prolonged periods, implying that the relationship of animals within a herd and even within a village is potentially narrow and inbreeding may be widespread and increasing. Therefore, with regard to specific breeding objectives, a holistic approach to species and breed attributes needs to be taken into account so that the full array of contributions that livestock makes to livelihoods as shown in this study and the genetic characteristics related to these contributions can be recognized.

The reasons for keeping cattle identified in this study of livestock keepers in Suba and Teso districts in Kenya reflect their multiple objectives and are consistent with the findings of other similar studies (Bebe *et al.* (2003) and Jaitner *et al.* (2003)). Farmers in both districts rated productive traits (traction, milk yield, meat) as very important, and the SEAZ was highly preferred particularly with regard to its adaptive traits. Despite such preferences, SEAZ population numbers are considered to have been in decline.

While some degree of breed substitution may be economically rational given processes of intensification, it is important to appreciate that, given the important traits and functions identified above, SEAZ cattle will continue to play an important role in contributing to livestock keepers' livelihoods in these districts. Furthermore, the potential to improve SEAZ performance through breeding and improved management suggests that livelihoods can be enhanced through sustainable use while pursuing conservation objectives.

Conclusions

- The farms in the rural communities investigated were approximately 7.8 acres, in most cases, under the control of male farmers, of which more than half had education. Farming was mixed in nature with a variety of livestock. Livestock farming consisted of communal grazing during the day, and confining (Bomas) at night at individual homesteads. Livestock on most of the farms were cattle, goats, chickens, pigs and a few sheep. Most farmers had cattle, but chickens occurred in greater numbers. More than 50% of the farmers' yearly income was approximately Kshs. 9116.22 (US \$ 121.5) generated mostly from agricultural resources (95%). However, 5% of farmers had income generated off farm sources.
- From these results it can be concluded that interventions could contribute to more effective farming and increased income. However, assistance to these farmers could contribute positively to their household and food security, if prior knowledge is obtained through collaboration with the farmers and suitable assistance is provided according to the needs of the different communities.

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