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A study on livestock marketing and quarantine measures in Rejaf and Nimule Payams, South Sudan

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Abstract: A 6-month study was conducted in Rejaf and Nimule Payams, South Sudan to determine factors influencing the dynamic trends of livestock marketing system and quarantine measures. A total of 1,850 livestock investigated, of which 67.57% cattle, 20.0% goats and 12.43% sheep. Relevant data and information were collected from key stakeholders using participatory tools. Physical observation and inspection of livestock markets and quarantine facilities were made. Data were analysed using Statistical Package for the Social Sciences (IBM SPSS 21) software compatible to windows. Graphical presentations were made using Microsoft Excel 2010. Comparison between goats and sheep buying, selling prices and selling profit were analyzed using the non-parametric Wilcoxon Signed Rank Test for two related samples. Statistical significant differences between means were fixed at P-value <0.05. Results revealed that multiple taxes along the road, trucking costs, competitive imported exotic cattle breeds and socio-cultural norms of livestock owners mainly influenced livestock marketing. Stunting profit between sheep and goats revealed high significant differences (P < 0.0001). No proper quarantine facilities established at the Nimule entry point that may endanger human safety due to transboundary animal diseases (TADs). Application of strict quarantine measures and creation of livestock marketing information system are needed for sustainable socio-economic development of South Sudan.

Key Words: Livestock marketing; Exotic and Indigenous livestock breeds; Quarantine facilities; Socio-economic Development; South Sudan

INTRODUCTION

Livestock constitute a milestone of household capital assets and key productive resources for pastoralist communities in South Sudan (MARF, 2012). Moreover, livestock sector is one of the imperative economic sectors contributing 15 % of the gross domestic product (GDP) through traditional livestock marketing and trade systems (ASIP, 2013). However, livestock marketing and trade face a couple of challenges to streamline livelihoods of pastoralists and agro-pastoralists. Evidences have shown that development of international livestock trade is an increasingly important trends of the modern agriculture in which the annual exported value of livestock alone contributes more than 5 billion US\$ dollars (FAO, 2002). Namibia, Botswana and South Africa exported beef on the basis of zones free from foot and mouth disease (FMD) which was challengeable for TADs (Thomson, 2008). Cattle trade between Southern Sudan and Uganda was flourishing through Kaya, Kajokeji, Kerwa, Nimule and Tsertenya, but it was declined due to a fear from East Coast fever (ECF), trekking for about 1,000 km, quarantine routine, multiple taxes, among others (King and Mukasa-Mugerwa, 2002).

Livestock quarantine measures are implemented worldwide to prevent the introduction of livestock diseases (FAO, 2002). Moreover, these measures provide protection to both consumers and producers from major human health hazards, harmful pests and diseases for agricultural production (Kompas and Che, 2009). Hence, Australia has built a quarantine system which is highly efficient and effective for blocking the import of agricultural products (EU, 2003). However, a few studies have been conducted for livestock marketing system and quarantine measures. So, development of livestock marketing information system and application of strict quarantine measures are imperative for sustainable development of livestock and provision of human safety in South Sudan. The purpose of this study was to identify driving forces for livestock marketing and quarantine measures for socio-economic development of South Sudan.

MATERIALS AND METHODS

Study Area

The study was conducted at the Gumbo livestock markets of Rejaf Payam, Juba County, Central Equatoria State

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(CES) and Nimule entry point of Nimule Payam, Magwi County, Eastern Equatoria State (EES), South Sudan. Gumbo livestock market is located at 3km in the south-east of Juba Nile bridge at 4° 50'60" N and 31° 37' 0" E with an average altitude of 550 m. Whereas, Nimule is bordering Uganda and located about 185 km in south-east of Juba Town at 3° 35' N and 32° 03' E with an average altitude of 653 m.

Study Livestock

A total of 1,850 apparently healthy livestock, of which 1,250 (67.57%) indigenous (Nilotic) and exotic (Ankole) and (Lugbara) cattle breeds from Uganda, 370 (20.0%) goats and 230 (12.43%) sheep were investigated. Livestock are brought to the markets mainly for slaughter purposes from various locations including Terekeka, Bor, Pibor, Kapoeta and the neighbouring Uganda. The sample size was determined by 95% confidence interval at a desired level of 5% (Thrusfield, 1995).

Study Design

A cross-sectional survey on livestock marketing was designed. This was intended to determine livestock breeds, species and prices. Mechanism of quarantine measures identified. The study elapsed for six months using purposive sampling method.

Study Method

Participatory tools were used in the collection of primary data and information. These tools include community group discussions and meetings with key informants. Four-scale questionnaires on livestock marketing and quarantine facilities for fifty key stakeholders of both sexes were administered.

Data Management and Statistical Analysis

Data management and statistical analysis were made using Statistical Package for the Social Sciences (IBM SPSS 21) software compatible to windows. Graphical presentations were made using Microsoft Excel 2010. Comparisons between goats and sheep buying, selling prices and selling profit were analyzed using the Non-parametric Wilcoxon Signed Rank Test for two related Samples. Statistical significant differences between means were fixed at P-value <0.05.

RESULTS AND DISCUSSION

Livestock Marketing

No specific livestock market is allocated at Nimule compared to the Gumbo's livestock markets. This could be due to the fact that Juba County is attractive and lucrative for livestock marketing, trade and investment. It is intended to meet the daily increasing demands of animal proteins for human consumption in Juba Town (MARF, 2012). Development of domestic and export livestock markets in Kenya and Ethiopia has reduced poverty, enhanced income and supported lucrative oriented livestock markets (Aklilu, 2008). The exotic breeds are more available in the market and expensive than our indigenous breeds. This is ascribed to the peaceful conditions for trucking livestock to South Sudan through Nimule high way. However, multiple taxes (42%) and trucking costs (54%) as shown in table (3) have led to skyrocketing of livestock prices in Juba Town (Tables 1 and 2). Moreover, imported livestock from the neighbouring countries impacted negatively on the livelihoods of pastoralist communities. This could be attributed to relatively large-sized Ankole and Lugbara cattle breeds compared to small-sized and inexpensive indigenous breeds which depend on natural pasture and trekking.

It appears that trucking of exotic livestock can maintain healthy weights. Observation of a few numbers of indigenous livestock at the market could be attributed to the social prestige and cultural norms of our pastoralist communities in keeping livestock for quantity as cattle serve as a store of wealth (Low *et al.*, 1980; Jarvis, 1980). Hence, apparently healthy and non-productive livestock are only subjected to the sale. Such socio-cultural attitude and perception could impact negatively on the local livestock marketing, trade and investment.

From the table (1), the minimum, mean and maximum buying prices for goats and sheep in Juba County were in the order: sheep, 150, 233 ± 15, 300; goats, 260, 343 ± 19 and 450, respectively. The minimum, mean and maximum of selling price/head for sheep were in the order: 200, 300 ± 20, 400; Goat, 400, 500 ± 20 and 600, respectively. However, the minimum, mean and maximum profit per head for sheep and goats were in the order: 50, 67 ± 6 and 100; 140, 173 ± 6 and 200, respectively. From the table (2), the difference between goat-sheep buying price; goat-sheep selling price and goat-sheep profit was highly significant ($P < 0.0001$).

Table 1: Marketing of sheep and goats at the Gumbo livestock market, Rejaf Payam Juba County Central Equatoria State South Sudan.

Animal Species	Buying Price (SSP)			Selling Price (SSP)			Profits (SSP)		
	Min	M ± SE	Max	Min	M ± SE	Max	Min	M ± SE	Max
Sheep	150	233 ± 15	300	200	300 ± 20	400	50	67 ± 6	100
Goats	260	343 ± 19	450	400	500 ± 20	600	140	173 ± 6	200

SSP, South Sudanese Pound; M, Mean; SE, Standard Error of the Mean; Min, Minimum and Max, Maximum; 1 US dollar = 2.96 SSP.

Table 2: The differences in buying and selling prices and profits between goats and sheep using Wilcoxon Signed Ranked Test for 2 related Samples at the Gumbo livestock market, Rejaf Payam Juba County Central Equatoria State South Sudan.

	Goat-sheep buying price	Goat-sheep selling price	Goat-sheep profit
Z-value	-3.771	-4.243	-3.771
asymptotic Sig. (2-tailed)	0.000**	0.000**	0.000**
Exact Sig. (2-tailed)	0.000**	0.000**	0.000**

*Significant ($P < 0.05$); ** highly significant ($P < 0.01$); NS Non significant ($P > 0.05$) two-tailed p level

Table 3: Frequencies and percentage of the respondents' response to each parameter of factors influencing livestock marketing in Juba County Central Equatoria State South Sudan

Parameter	Degree of Response	Strongly agree	Agree	Strongly disagree	Disagree	Total
Taxation impact	Frequency	21	21	3	4	50
	Percent	42	42	6	8	100
Insecurity impact	Frequency	31	13	4	2	50
	Percent	62	26	8	4	100
Poor road condition	Frequency	16	27	1	6	50
	Percent	32	54	2	12	100
Impact of transportation	Frequency	27	19	0	4	50
	Percent	54	38	0	8	100

Quarantine Measures

Application of strict quarantine measures in a country could protect human and livestock resources from introduction of zoonotic diseases that may pose a threat to public health and sustainable development of livestock. Quarantine measures impose costs of expenditures on the quarantine programme and the welfare losses associated with trade restrictions (Kompas and Che, 2009). In 2008 an outbreak of East Coast fever (ECF) occurred among indigenous cattle in Bor County Jonglei State causing high mortality rates among calf crops (Ochi *et al.*, 2009). Such an incidence could be explained by deficient quarantine measures of livestock imported from an endemic neighbouring country to ECF-free zones. Similarly, introduction of Highly Pathogenic Avian Influenza (HPAI) to Juba County in 2006 was most likely due to the purchase of frozen broilers from abroad (Ochi, 2008). Higgs and Hawkin (1998) revealed negative impact of sheep importation from New South Wales to Western Australia on the introduction of Johne's disease. This study revealed no proper diagnostic laboratory facilities observed at Nimule which could be

explained by inadequate veterinary services delivery system. As such the country could be exposed to all possible scenarios including inferior quality livestock products and human health hazards. This drawback is ascribed to deficient quarantine facilities as agreed by 56% of the respondents (Figure 1). Moreover 85% of the respondents strongly agreed on the importance of quarantine measures for the sustenance of animal and public health in South Sudan (Figure 2). Nunn (1997) revealed quarantine risk analysis which could be overcome by the development and implementation of quarantine policy on livestock in South Sudan. Furthermore, quarantine measures are crucial in imposing costs of expenditure on the quarantine programmes and the welfare losses associated with trade restrictions (Kompas and Che, 2009).

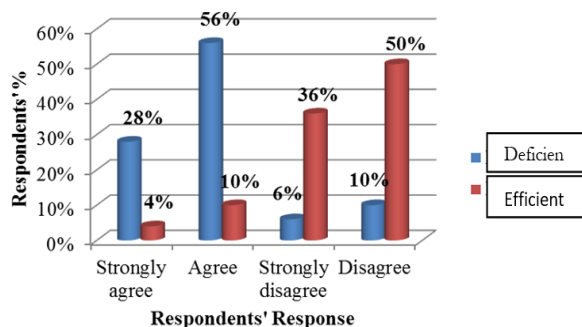


Figure 1: System of quarantine measures at Nimule, South Sudan

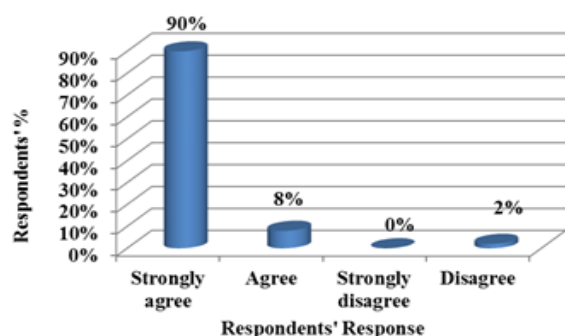


Figure 2: Importance of quarantine measures in animal and public health in Juba and Magwi Counties, South Sudan

CONCLUSION

Multiple taxes, transportation costs, competitive imported exotic cattle breeds and socio-cultural norms of pastoral communities are the major factors influencing livestock marketing. No proper quarantine measures are risky for human and livestock health. Further studies are needed for addressing shortages of quarantine measures and impacts of livestock marketing system on sustainable socio-economic development of South Sudan.

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