



Trends in
**Applied Sciences
Research**

ISSN 1819-3579



Academic
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Marketing of Sheep in Sudan, Profile of the Market System and Production: A Case Study of North Kordofan and Khartoum States, Sudan

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ABSTRACT

Sudan is one of the main exporters of sheep in African countries. Despite being on the marketing system of sheep is still undeveloped due to weakness of structural facilities such as low production technology, despised farms, market barrens, poor infrastructure and so on. This study aims to provide some insights on the marketing system of sheep in Sudan with special focus on the production sector in North Kordofan and Khartoum states in Sudan. The objectives of this study are to gain a better understanding of how the existing sheep marketing systems and to identify key constraints and potentials in the systems and to determine the marketing channels and margins. Primary data was used in this study to collect data from 103 sheep producers/traders in Elkhiwi and Elobied markets in North Kordofan and 25 producers/traders and middlemen in Elsalam in Omdurman central market in Khartoum. The results reveals that best time to selling sheep before Hajj season when the sheep begin to export to Saudi Market and other markets, the major sheep production cost items, were feed, drinking water and labor which contributing substantially to total costs 65.61% in Khartoum and 59.71% in North Kordofan. The marketing channels were so lengthy and middlemen's margins were almost equivalent to producer's profits. The study recommends intensive research for pasture improvement; provide sheep producers/traders with improvement in production technology, reduce marketing channel and price support for the supply of fodder, water and veterinary care and waive income taxes for the farmers.

Key words: Marketing costs, sheep, channel, marketing margin, taxes

INTRODUCTION

Sudan has large number of livestock, providing protein to most of the population with red meat and sheep milk. The livestock sub-sector is considered as the backbone of the economy. The contribution of livestock sub-sector in the agriculture and the Gross Domestic Product (GDP) in 2000 was 65 and 23%, respectively and this percentage dropped to 45 and 15.4% in 2008, respectively due to decreased number of sheep export and government extensive depend on oil

Table 1: Sudan: Livestock population (2002-2010) ('000)

Year	Sheep	%	Cattle	%	Goats	%	Camels	%	Total	%
2002	48,136	37	38,818	29	41,485	31	3,342	3	131,781	100
2003	48,440	36	39,760	30	42,030	31	3,503	3	133,733	100
2004	48,910	36	39,760	30	42,179	31	3,724	3	134,573	100
2005	49,797	36	40,468	30	42,526	31	3,908	3	136,699	100
2006	50,390	36	40,994	30	42,757	31	4,087	3	138,228	100
2007	50,994	37	41,100	30	42,987	31	4,250	3	139,635	100
2008	51,100	37	41,400	30	43,100	31	4,400	3	140,000	100
2009	51,555	37	41,563	29	43,273	31	4,521	3	140,909	100
2010	52,014	37	41,726	29	43,441	31	4,645	3	141,827	100
AAGR	2.3		2.2		1.4		3.2		2.0	

FAO (2011) AAGR: Average Annual Growth Rate

export. This sub-sector is able to meet domestic consumption requirements and a considerable amount for export. Sudan is one of the world's largest producers of livestock. Table 1 shows Sudan livestock production in 2010 which was estimated at around 141 million heads; comprising 51 million heads of sheep, 41.7 million heads of cattle, 43.4 million heads of goats and 4.6 million heads of camels (FAO, 2011).

This number of livestock puts Sudan as the leading livestock producer in the region and the Arab countries. Although livestock sector in Sudan plays a vital role in the country economics, this suffered many problems: diseases; low productivity in many states due to conflicts and insecurities lack of adequate marketing infrastructures and poorly organized and informed herders and traders. All of these factors are related to the lack of policies available to govern animal production, marketing, trading and veterinary public health and the absence of reliable data to prioritize sector development interventions. The main livestock production systems in the country is still follow a traditional pastorals (nomadic and semi-nomadic), agro-pastoral and the agrarian system (El-Hassan, 1994).

Normally the sheep prices in Sudan are constantly fluctuating within the year from season to season, this could be attributed to remoteness of production areas from consumption centers (Faki and Taha, 2007), poor integration of traditional sheep producers in the market due to their traditions and beliefs, presence of large number of middlemen and high taxes and levies imposed by different local governmental (Elrasheed *et al.*, 2008). The general objective of this study is to identify and analyze sheep production cost and marketing performance. The specific objectives of this study are to determine marketing channels, marketing costs and margins.

MATERIALS AND METHODS

The concept of revealed comparative advantage is grounded in conventional trade theory and it is a useful indicator of competitiveness and widely applied in agricultural studies (Mirzaei *et al.*, 2006; Klasra and Fidan, 2004; Haque and Rahman, 2002).

North Kordofan and Khartoum were selected to represent the study areas. North Kordofan was chosen because it is one of the higher sheep-producing areas in Sudan contributing about 14% of the total sheep population in the country (Aklilu, 2002). Within North Kordofan, Elkiwai and Elobied markets were chosen for data collection. This area basically produces a desert type (Hamari breed) of sheep. Sheep trader and producers from neighboring states in western Sudan who raise Hamari breed come to this market. Hamari breed have a high domestic and international

demand (Elrasheed *et al.*, 2008). Elkiwi and Elobied leading export Hamari breeds of Sudan's. Another market is Khartoum, the capital of Sudan. Khartoum is considered as the main livestock central market in the Sudan and it represents the major domestic consumption center and the main animal assembly point for export.

The primary and secondary data were used in this study to gather the required information with primary data as the main source. A total of 103 sheep producers/wholesaler from North Kordofan (ELkiwai and Elobied markets), 25 sheep producers/wholesaler from Khartoum state (Alsalam and alhalfaia markets), were interviewed by means of questionnaires. Data collection comprises on technical aspect and the cost of sheep production and marketing. The primary data collection was taken in 2010 from North Kordofan and Khartoum States.

The study used two tier sampling method. As for the areas of study, purposive sampling technique was used. Within the areas, the random sampling method was used based on the information provided by the Department of Agriculture. The interviewed was where their concentration of farmers was relatively high. This is to minimize the cost and get feed-back from as many sheep farmers as possible. In order to understand the market aspect and supply chain of sheep for export market, a survey on the major wholesalers and exporters were carried out. Table 2 shows the number of producer, wholesaler and exporter in the selected states which was estimated at 277(<http://www.preventionweb.net/english/professional/contacts/v.php?id=4524>).

Domestic livestock marketing: Generally, the livestock in Sudan is most prevalent in the rain-fed farming areas in Eastern, Western and Central Sudan where they are raised under nomadic and transhumance systems (moving with livestock and growing short-maturity subsistence crops). Ruminant feed consists of pastures, browse, crop residues and supplements of cereals and oilseeds.

The structure of livestock market in Sudan consists mostly of primary markets that begin at the village level, secondary that exist in cities and with fewer final markets such as Omdurman market in Khartoum state and recently the government opened new market in ElKhowi in North Kordofan state to export sheep directly.

Sheep marketing procedure: When owners of sheep attend to the market to sell their sheep, must register in market office how many animals they want to sell to get permission to enter the market. Usually sheep are sold directly from the range or auction place at 2-4 years of age to the butchers (EI-Hag and Mukhtar, 1978). Sheep dealers buy their animals through bargaining process from the sheep owner. The sheep are bought in groups at auction or individually according to their availability. Price is arbitrarily determined, although the age, condition of the sheep and season of year may have some influence on the bargaining process. The prices received by the producers for sheep are based on the size of the sheep for sell agreed by the parties concerned after a bargaining process. After the sheep sold in the market, the seller and payer would pay a fee to the market to get permission to take their animal out of the market.

Table 2: Number of producer, wholesaler and exporter registered in the states

States	Producer	Wholesaler	Exporter	Total
Khartoum	26	41	20	87
North Kordofan	122	46	22	190
Total	148	87	42	277

(<http://www.preventionweb.net/english/professional/contacts/v.php?id=4524>)

Division of labor within the market channels: Mostly, trade and Pastoralists in the livestock market are men. A woman is found buying or selling animals in the markets. Sometimes women's have responsibility when animal sales take place at the village level with itinerant traders. Women's activities in North Kordofan and Gadarif states are to look after goat's milk kept at home. Cattle and camels are milked by men. In the rain season, when the herds come around the villages, North Kordofan women transform milk into liquid butter and skimmed milk and follow the herds to other states during rainy season to process and sell milk and milk products in the market.

Marketing channels of sheep in selected states: Sheep marketing channels in Sudan depends on the flow of livestock producers to the final consumer. The marketing channel in Sudan is very long due to the remoteness of producing areas from consumption centers (Faki and Taha, 2007). Figure 1 presents the marketing channels in Sudan. The supply chain is characterized by many intermediate stages, with transaction costs being taken up mostly by intermediary traders and brokers (FAO, 1997). Most trading is done by private treaty, with the exception of large numbers of sheep intended for export which are sold by private auction at primary, secondary or terminal markets. Resale in the same market on the same day is common and animals may be fattened or reconditioned before resale. The following descriptions of the various market intermediaries are based on surveys carried out in 2010 and personal observations.

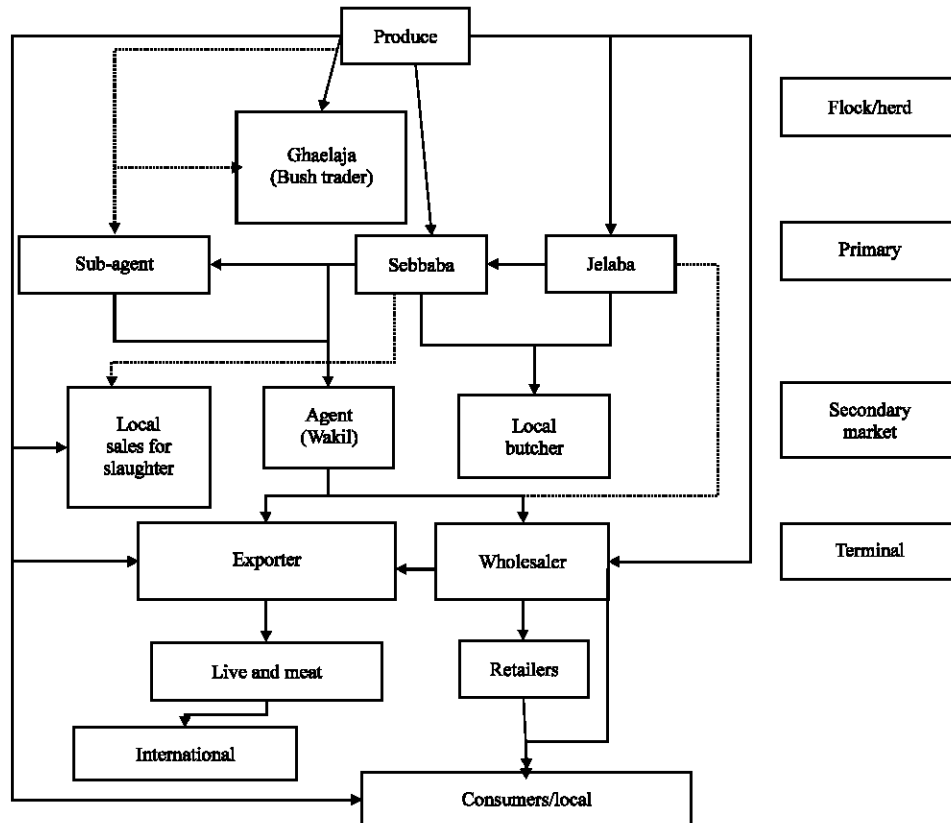


Fig. 1: General schematic diagram of the sheep market chain in Sudan

Ghelaja (Bush traders): These agents purchase animals directly from producers at grazing areas, villages or primary markets and sell the animals to local brokers (sebbaba) at primary markets. Their revolving funds for purchases do not normally exceed SDG 100,000 (USD 400), enough to buy about 10 sheep only.

Sebbaba (Local brokers): In Sudanese livestock markets, according to the roles they play in the transaction, Sebbaba purchases sheep either from ghelaja or directly from producers at the primary market. They, then, sell the animals either at another primary market or at a secondary market. Their capital is about SDG 500,000 (USD 2000). Although they are called local brokers, they are also traders in the sense that they purchase animals from one market and sell in another market or in the same primary market. However, at the primary markets they are called sebbaba because they mostly act as brokers and act as a link between buyers and sellers.

Jellaba (Suppliers): Jellaba purchase animals from remote production areas and bring them to the terminal markets for live sheep export. They may work in partnership with sheep exporters and wholesalers. They are speculative traders who buy and sell livestock with the main aim of profiting from price fluctuations.

Damin (Guarantor): The damin provides guarantee to the buyer that animals offered for sale are not stolen and that the seller is known by tribe. Each tribe has a guarantor. They are present in all livestock markets in Sudan with high concentration in production areas. They also provide services for livestock owners, providing credit for managing and accommodating animals and sometimes advice producers as to whom they can sell on credit basis. To operate in the market, they must have a valid license from local authority. They charge a fee of SDG 100 per head (USD 0.4).

Wakil (Agent): Agents act only as representatives of their clients; they do not own the animals they handle. They receive their income in the form of fees and commissions and provide services to buyers and sellers. Often, the main service they provide is market information and the linking of buyers and sellers.

RESULTS AND DISCUSSION

Total cost of sheep production (breeding) in north Kordofan and Khartoum states 2010:

To calculate the average total cost of sheep production in selected states during one year (2010) using traditional methods were found to be, in North Kordofan and Khartoum, SDG 64.77/head and SDG 66.24/head, respectively (one US\$= 2.7 SDG). Although in North Kordofan producers depend on natural pasture to feed their animals during the rainy and somehow winter seasons and resort to purchased feed during summer and under poor environmental conditions, still, animal feed counted for more than 40%. The labor cost occupied the second position, contributing about 35% of the total cost followed by water cost 6.42%, medicine 3.67%, tax 3%, zakat 1.57%, fine 1% and salt 06%. Meanwhile, the total cost of sheep production in Khartoum during 2010 is as follow: animal feed counted for more than 53%, the labor cost occupied the second position, contributing about 28% of the total cost followed by water cost 6%, tax 5%, veterinary 3%, medicine 2% zakat 2% and fine 2%.

Table 3 shows that the cost of sheep production in season 2010 in North Kordofan and Khartoum states. The higher cost of production is animal feed it presented 40 and 53% from the

Table 3: Cost of sheep production in season 2010, SDG/head/year

Cost items	North Kordofan		Khartoum	
	Total cost	Percent of total (%)	Total cost	Total (%)
Water	6.42	10	3.72	6
Labor	22.62	35	18.5	28
Veterinary	0	0	2	3
Medicine	3.76	6	1.12	2
Animal feed	25.8	40	35	53
Taxes and fee	3	5	3	5
Zakat	1.57	2	1.2	2
Salt	0.6	1	0.3	0
Penalty	1	2	1.4	2
Total	64.77	100	66.24	100

Field survey, 2010

total cost in North Kordofan and Khartoum respectively followed by labor 35 and 28% and then the water cost come in third place represented 10 and 6% in North Kordofan and Khartoum respectively. The total of the three items (animal feed, labor and water) in North Kordofan around 85% from the total cost, while in Khartoum was 87%.

Transportation cost from production area to terminal market: Generally, producers/traders transport sheep from production areas to the consumption areas or to central market, either on hoof-trekking or by trucks. In North Kordofan (Hamari sheep) the most convenient method of moving sheep from production areas to consumption areas is trekking (on hoof) (Elrasheed *et al.*, 2008), where sheep are usually driven during the wet (rainy) and cold (winter) months of the year (July to February). By trekking, usually sheep are transported to Omdurman central market in consignments. Depending on the market demand, the average number of trips is two to three per year (Mohamed, 2002) with one thousand animals per trip. The Khabeir (guide) is responsible for the well-being of the sheep until they reach their final destination. Khabeir is decides when to move, the speed of movement and when to rest. However, Kabeir and shepherds are responsible for any losses incurred during the trip. For this reason, the Khabeir and the shepherds must be very trustworthy and well known to the merchant. Most of the shepherds and the Khabeirs are paid on per trip basis. The average payment for the Khabeir (SDD 7.5 thousand per trip) is higher than the payment for the shepherd (SDD 3.5 thousand). The trip from production area to central market in Kharoum (Omdurman) usually takes 30-60 days, depending on the conditions of the sheep, grazing conditions and water availability, the market from where it is bought and the weather factor.

Table 4 shows the transportation cost from the production area to the consumption area using two methods of transportation Trucking and Trekking of Sheep. Usually producers/traders prefer this method of transportation because it offers the opportunity to fatten animals through grazing on natural pasture and besides, it stores wealth on hooves. It is considered as one of the main features of livestock marketing in Sudan. On the other hand, producers believe that truck transport is more convenient in transporting young animals due to the short time taken to final destinations, low death rate and somehow, low expenses compared to trekking. But they resort to it only when their obligations of sheep supply falls due. In normal situation, they do not prefer truck transport

Table 4: Cost comparison between trucking and trekking of sheep from El khiwi to Khartoum

Item	Trucking (0.5 days) Cost SDG/ 100 head	Trekking (30 days) Cost SDG/ 100 head
Truck rent	75,000	0
Loading and unloading	6,750	0
Shepherd (two)	10,000	30,000
Guide	0.00	30,000
Shepherd expenses	1,000	27,000
Drinking water	0.00	15,000
Trader expenses	1,000	21,000
Pass points feed	5,000	0
Losses and death	5,695	31,639
Opportunity cost of capital	0.00	14,405
Total	104,445	169,044
Cost per head	104,445	1,690.44

Field survey, 2010

due to additional cost incurred in either keeping animals in the central market for sale for extended periods of time or hiring shepherd/s to store animals on the hoof in the surroundings of Omdurman town.

Cost of storage in the central market: Sometimes producers/traders need to keep their sheep in storage until time of sale. This keeping of sheep costs feeding, water, store rent and security. Farmers use this period to fatten the animals so the price is higher. Usually, stored sheep are fed with a mixture of agro-industrial feeds such as fodder beans, sorghum, cotton seed, etc. Table 5 shows the cost of sheep store rent and feeding per head for each day in Elsalam markets. These major costs items are fodder beans, sorghum and cotton seed, water and rent stores. The cost of store rent was calculated to be SDG 0.10, which constituted 8% of the total storage and feeding cost per head. The total cost of sheep feeding per head for each day was calculated to be SDG 1.25; whereas fodder beans constituted the major cost item (32%) of the total storage and feeding cost, followed by cotton seed (24%), sorghum (12%), water (8%) and security (16%).

Producers and wholesalers preferable time to sell their sheep: Usually, the main selling season is expected to extend from August to February. Figure 2 shows that most of the sheep producers and wholesaler (63%) sell their animals during the rainy season because they need the cash to buy their needed from the city market after long journey away from home in search of pasture and water. The second seasons preferable to sale sheep is winter (21%) followed by summer seasons (16%), from this result observed that a higher sheep sale was during rainy season and shortages during summer, according to the survey, the best age for sheep be sold in the market is bigger size sheep of more than two years because producers and wholesaler fetch high prices.

Sheep marketing margins: The average price for two years old male sheep in selected states, which was used in the calculation of the marketing margins of sheep in the North Kordofan and Khartoum states, was SDG 450 and SDG 480, respectively (Table 6). The average cost of breeding, production and transporting sheep (truck transport) was used in the calculation of the marketing margins.

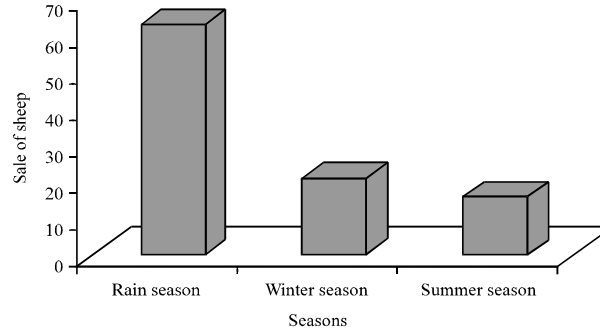


Fig. 2: Selling sheep at different seasons of the year (%)

Table 5: Storage and feeding cost in Elsalam livestock market SDG/herd per day

Item	SDG/head/day	Total Cost (%)
Fodder beans	0.40	32
Sorghum	0.15	12
Cotton seed	0.30	24
Water	0.10	8
Store rent	0.10	8
Security	0.20	16
Total cost	1.25	100.00

Field survey, 2010

Table 6: Sheep marketing margin in selected states SDG/head

Item	North Kordofan		Khartoum	
	Cost/ head	Share (%)	Cost/ head	Share (%)
Cost of breeding sheep + cost of transportation and waiting in the market	137.54		152.48	
Produce price	345.2		320.6	
Producer margin	207.66	66.46	168.12	51.33
Central market price	450		480	
Middlemen margin	104.8	33.54	159.4	48.67
Total margin	312.46	100	327.52	100

Field survey, 2010

Table 6 shows the results of sheep marketing margins in North Kordofan and Khartoum states. Producers get reasonable and encouraging returns to remain in business in North Kordofan and Khartoum (SDG 345.2 and 320.6, respectively). In fact, the producers gain good profits when compared to the production costs (SDG 137.54 and 152.48, respectively). On the other hand, share of the middlemen's in the marketing margins in North Kordofan and Khartoum states are 33.54 and 48.67%, respectively and producer margin are 66.45 and 51.33, respectively. This surely would be harmful to sheep marketing as sheep prices increase due to the increasing marketing costs.

CONCLUSION

From the result and discussion above can observe that the cost of sheep production in North Kordofan less than Khartoum state by 1.47 SDG and the animal feed representative a higher cost from the production in both states followed by labor and ware. Although, the cost of transportation by trucking cheaper than transportation by trekking (on foot), but the producers/traders prefer transportation by trekking because it offers the opportunity to fatten animals through grazing on natural pasture. The best time for selling sheep in the market during rainy season because the producers buy their needed from the city market in that time, while the best age to selling from the sheep was two years old. Despite the producer gain good profit when selling sheep, the middlemen gain around 33.54% from the total profit in North Kordofan and 48.67 in Khartoum state, this percent reduced the producer's profit.

RECOMMENDATION

Based on the result of this study, find that high marketing cost is the main cause of the imperfections of sheep marketing performance. However, marketing cost can be improved by the following recommendations to increase sheep marketing performance:

- Improving infrastructure such as roads, markets, to reduce transportation cost
- Reduce the mortality rate cost by improving loading and unloading practices by labor training and provision of animal feed and water at the market throughout the year
- Improvement in production by Support for the supply of low-cost fodder, water and veterinary care
- Extension of services to promote more sales of younger sheep
- Government should reduce the taxes and fees imposed on producers and traders and reduce the market channel (middlemen)

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