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Full Length Research Paper

Sheep marketing performance: A case study of Khartoum State, Sudan

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The main objective of this study is to investigate the possibility of improving marketing efficiency, regarding the emphasis concerning marketing cost and margins. The study was based on both primary and secondary data. Primary data was collected through questionnaires, and the questionnaires were applied to the wholesalers, producers and retailers through stratified random sampling, while secondary data was obtained from sources related to the study area. Descriptive statistics analysis and marketing performance measurements were used as tools of analysis. The study showed that, the sheep marketing performance was featured by high transportation costs, costs' losses and mortality, taxes and multiple fees. In order to reduce marketing costs, the study recommended construction and improvement of infrastructures (for example, roads and transportation means, improvement of loading and un-loading practices and utilization of large well equipped trucks suitable for physical characteristics of animals), and that the governments should reduce the imposed taxes and multiple fees on producers and traders, as well as establish risk management units in the areas where armed robbery and insecurity are prevalent.

Key words: Sheep marketing, marketing costs, marketing performance.

INTRODUCTION

Sudan is the largest country in Africa, occupying an area of about one million mile square (Saboun, 2002). The agricultural sector plays a significant role in the Sudan economy (Ministry of Finance and Natural Economics, 2003). The main agricultural system in Sudan is composed of five main sub-sectors, namely: (1) the traditional rain-fed, (2) the mechanized rain-fed, (3) livestock and (4) forestry. El Hassan (1994) stated that the main livestock production system in the country is as follows: traditional pastorals (nomadic and semi-nomadic), agro-pastoral and the agrarian system. The main livestock breeds in Sudan are camels, cattle and sheep. The livestock population put the total animal population at about 40, 49, 42 and 37 million herd of cattle, sheep, goats and camels, respectively (FMAR, 2005).

Abbott (1993) has summarized the tasks and responsibilities of marketing as a process of finding a buyer and transferring ownership, assembling, transporting, storing, sorting, packing and processing to the customers; and providing and presenting the finance for marketing, risk-bearing and assorting to consumers. Dixie (1989) has described the definition of marketing as the series of services involved in moving a product or a commodity from the point of production to the point of consumption. Also, Emam (2002) has described the definition of marketing as the series of services involved in moving a product or a commodity from the point of production to the point of consumption. The movement of sheep from the production area to the consumption centre plays a major role in the sheep marketing performance, due to the fact that production areas are at a far distance from the consumption centers in Sudan. The far distance may result in excess services of marketing, mortality and loss of animals. Sheep markets in Sudan lack some basic infrastructural facilities such as paved roads and transport (Babiker and Abdalla, 2009). The sheep are mainly transported by trekking from the primary markets to the secondary markets, and seldom

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by trucking to the final markets (Babiker and Abdalla, 2009). Thus, the results will be high marketing cost and margins, which have a negative effect on the overall sheep marketing performance. The performance of marketing system can be measured in terms of its effectiveness and cost efficiency (http://www.fao.org/docrep/004/w3240e/w3240e12.htm). The movement of goods from producers to consumers must be done at the lowest cost without affecting consumer satisfaction (FAO, 1960). This research is very important in providing implications for policy makers, investors and producers with the necessary conclusion and recommendations, to allow them greatly improve this sector. The general objective of this study is to investigate the possibility of improving sheep marketing performance with special emphasis on marketing cost and margins. The specific objectives of this study are to study the sheep marketing channels, physical distribution costs and marketing costs and margins.

MATERIALS AND METHODS

The study area

The division of livestock markets in Omdurman are divided two markets

Elmoueleh livestock market: This market is located in the municipality of Omdurman, monitored by the administrative unit of the Western Rural Area of Omdurman. It lies between latitude 15°:23′ N and longitude 32°:19′ E. The market covers an area of 85,000 m, and it represents the export or central market. The majority of buyers are exporters and butchers, while wholesalers and agents are the dominant sellers.

Dar Elsalam livestock market: This market is cited in the peripheral western area of Umbadda municipality under monitoring by the administrative unit of Dar Elsalam. It lies between latitude 15°:30′ N and longitude 32° :23′: 07" E, covering an area of 50,000 m. It represents the main market for local consumption, in which the majority of buyers are consumers and meat exporters, while retailers are the dominant sellers. The Animal Resource Company, which is a subsidiary company of the Animal Resource Bank, supervises these markets.

Data collection

The data was collected from both primary and secondary sources related to the field of the study. Secondary data was collected from the Ministry of Animal Wealth, Bank of Sudan, Ministry of Finance and National Economy and the Ministry of Agriculture and Forestry, while primary data was collected by means of questionnaires. Three types of questionnaires were specially designed to collect information about marketing costs and margins of producers, wholesalers and retailers' levels.

Sample size

Stratified random sampling has been followed by a sampling frame that was obtained from the administrative unit of the western rural area and the livestock traders union. The sampling frame is a list of wholesalers, exporters and retailers at each market. The total numbers of producers at the markets are unknown, as estimated by the Animal Resource Company. Practical considerations such as seasonal supply, research budget, time and transport facilities were the main factors that determined the sample size. The sample size of 45, 55 and 70 respondents from wholesalers, producers and retailers were chosen, respectively.

Tools of analysis

Descriptive analysis and marketing margins measurements were used to examine the marketing performance or efficiency.

A guide to sheep marketing costs and margins

The intention of this guide is to identify the basic concept of sheep marketing costs and margins. Marketing costs are the costs that are incurred during the movement of the commodity from the production areas to its final destination (www.fao.org/docrep/004/w.3240e/w3240e12htm). This movement could be done by farmers, intermediaries, wholesalers and retailers. With increased urbanization and industrialization, marketing costs tend to become relatively higher than farm gate prices. However, sheep marketing costs include labor, transport, loading/ unloading, feeding cost and/ or mortality, official payment, commission and other costs.

Loading and unloading costs

Loading and unloading costs are the costs incurred during the process of moving the animals in and out of the trucks.

Labor loading costs

It is the amount of money paid to the laborer for loading the sheep on the trucks, in addition to his supervision and monitoring of the sheep during their movement to the final market.

Labor unloading costs

It is the amount of money paid to the laborer for unloading the sheep from the truck at the final markets.

Transportation cost (truck rental)

Transportation costs are costs incurred due to the movement of sheep from one place to another. Generally, there are two types of transportation cost: (1) Direct transportation cost, which is the direct payment of money from the farmer or trader to the truck owners, and (2) Indirect transportation cost, which occurs when the traders or farmers use their own vehicle. In the transportation process, payment to truck owners will be on per head basis or per journey. For the indirect transportation cost, the cost of hiring the truck as the best guess and the cost of a truck (owing to the trader), can be used (Shepherd, 1993).

Losses or mortality costs

During the marketing process, some of the animals may be lost, stolen or dead. The causes of such losses are countless and they vary. This type of cost occurs at all stages of the marketing

channels. Cost of losses per head is treated as the average cost from three sizes: big, medium and small size of sheep, at each marketing level. The calculation is based on the following equation:

$$\text{Cost of losses per head} = \frac{\text{The value of animals lost} \times 3 \text{ or } 2\%}{\text{The remaining animals available for sale}}$$

where 3 or 2% is in the cases of trekking or truck transportation, respectively.

Storage costs

Storage is carried out in order to extend the period of availability of a product to consumers (Shepherd, 1993). It could be done by farmers, traders and/or consumers. Storage costs include only the rent cost which is the actual amount of money paid to rent the stores or fences and it is usually paid on per head basis.

Animal feeding cost

Feeds purchased for the sheep usually contain a mixture of agro-industrial feeds. The composition of the rations depends on the availability and cost of its components.

Taxes, fees and commission payments

These types of costs vary from one place to another. They include taxes and fees paid to government, like zakat, veterinary charge, water charge, license and commissions paid to some agents at all marketing levels.

Calculation of total marketing costs

Total marketing costs were calculated by summing up all the costs incurred during the process of sheep marketing. The calculation varies according to the complexity of the sheep marketing channel, numbers of intermediaries and other services.

Marketing margins

Based on the market level, several types of marketing margins are being considered. The wholesaler margin is the difference between the price paid by the wholesaler and the farm gate, or producer price (in the case of a non-existent local trader), while the retailer margin is the difference between the price, the retailer pays and the retail price he charges the consumers. Marketing margins can be calculated for different levels of the market as follows:

Marketing margin = $P_1 - P_2$

Where:

P_1= Selling price at certain marketing level
P_2 = Buying price at the same marketing level

RESULTS AND DISCUSSION

Sheep marketing channels

Figure 1 showed the flow of sheep, starting from producers and going through several traders to finally reach the consumers or exporters. Producers either sell their sheep to the wholesalers or to the butchers and rural traders. Rural traders (Gallaji) purchased the sheep from producers in primary markets and sell them to wholesalers or butchers at central markets. However, the wholesalers sell their sheep to retailers, exporters, butchers and/or institutions, while retailers sell their sheep to consumers, butchers and/or institutions.

Results of the physical distribution cost analysis

The physical distribution cost of sheep per head is composed of two main activities (transportation and storage).

Transportation

There are two means of sheep transportation from the production areas to Elmouleh/Darelsalam livestock markets. These are trekking and trucks transportation.

Trekking: Trekking is the primary means of moving livestock from producers to consumers or export market. Table 1 showed the physical distribution cost of sheep per head at producer level by methods of trekking from Elfasher to Elmoueleh/Darelsalam livestock market. The total physical distribution cost per head of the sheep was calculated to be SD 1639. The major cost items were taxes, fees and veterinary charges, which constituted 30.51% of total physical distribution cost per head. This was due to the lack of veterinary services and feeds along the road and along the period of trekking (36 days). The second cost item was losses or mortality which represented about 28.92% of the total physical distribution costs. Payments to animal drivers, water charge, guides and feeding plus labor costs represented 12.81, 12.20, 9.15 and 6.41% of the total physical distribution cost per head, respectively:

Cost of losses (big size) = 3×18500/97 = 572 SD
Cost of losses (medium size) = 3× 16000/97 = 495 SD
Cost of losses (small size) = 3× 11500/97 = 356 SD
Average cost of losses per head at producer level = (572 + 495 + 356)/ 3 = 474 SD.

Truck transportation: Truck transportation is an alternative means of transporting sheep from the production areas to the consumption centre. From Table 1, the physical distribution cost of the sheep per head at producer level by methods of truck from Elfasher to Elmoueleh livestock market was SD/ head 3373. Truck rent per head was SD 2050, and this constituted 60.78% of the total physical distribution cost per head. The high truck rent was due to lack of improved roads, insecurity situation (particularly in Darfur) and inadequate number

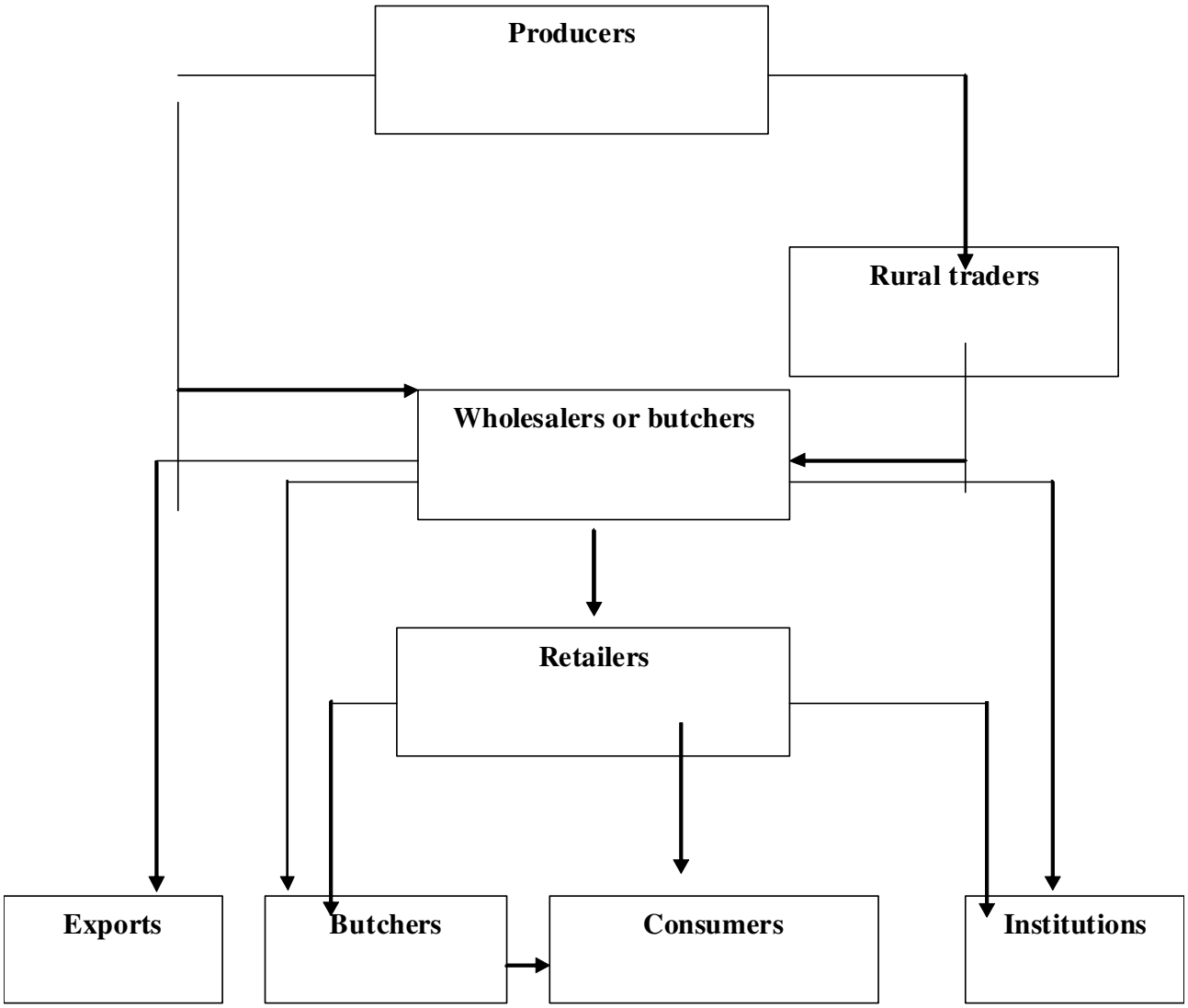

Figure 1. Sheep marketing channels. Source: field survey, 2004.

of specialized trucks of transporting sheep on a large scale. Although the truck rent cost was high (SD 2052), it was preferable by the producers or traders, due to its advantage of quick delivery. It took three days to reach the market and the final consumer. Fees, taxes and veterinary charges (government payments), loading/ unloading, losses or mortality, feeding plus labor and water charge cost constituted 14.82, 11.86, 9.28, 3.11 and 0.15% of the total distribution cost per head, respectively.

The largest cost item was truck rent (SD 2050), which constituted 60.78% of the total physical distribution cost per head. A trek recorded high cost in terms of taxes, fees and veterinary charge (government payments) (SD 500), which constituted 30.51% of the total physical distribution cost per head, and losses or mortaliy (SD474),which constituted 28.92% of the total distribution cost per head, under the level of losses or mortality rate of 3% compared with 2% by truck mortality rate. The reason was the short period of transit by truck, and the 3 days comparison with the 36 days by trek. However, the physical distribution cost per head of sheep by trekking method was less than trucking.

Storage (Cost of keeping it in the market till the time of sales)

Storage cost consists of feeding cost plus cost of store rent. Farmers used this period to fatten or recondition cost per head, and losses or mortality (SD 474), which their sheep. Stored sheep are usually fed with a mixtureof agro-industrial feeds such as cotton seed cakes, straw, groundnuts shells, etc. The composition of the rations

Table 1. Physical distribution costs of sheep (SD /head) at producer level by methods of trekking and truck from Elfasher to Elmoueleh/ Dar Elsalam livestock markets, 2004.

Item	By trekking		By truck	
	Cost per head (SD)	%of total distribution n cost	Cost per head (S)	%of total distribution cost
One guide Khabier for 1000 heads	150	9.15	-	-
Six animal drivers for 1000 heads	210	12.81	-	-
Truck rental	-	-	2050	60.78
Loading / unloading	-	-	400	11.86
Fees, taxes, veterinary charge	500	30.51	500	14.82
Water charge	200	12.20	5	00.15
Losses or mortality	(3%)474	28.92	(2%)313	09.28
Storage	-	-	-	-
Feeding + labor	105	6.41	105	03.11
Total distribution cost	1639	100	3373	100

Source: field survey 2004.

Table 2. Storage and feeding cost in Elmoueleh/ Darelsalam livestock market SD/herd per day.

Cost item	SD/ herd/day	% of total cost
Cotton seed cake	45.00	39.13
Dura grain	20.00	17.39
Groundnut shells	35.00	30.43
Herd man	5.00	4.35
Store rent (fence)	10.00	8.70
Total cost	115.00	100.00

Source: field survey, 2004.

depends on the food availability and costs of its components. Table 2 showed the costs of sheep feeding and store rent per head for each day in Elmoueleh/Darelsalam markets. These major costs items are cotton seed cake, dura grain, groundnut, herd man cost and rent stores. The total cost of sheep feeding per head for each day was calculated to be SD115; whereas cotton seed cake constituted the major cost item (39.13%) of the total storage and feeding cost, followed by groundnut shells (30.43%), dura grain (17.39%) and herd man (4.35%). The cost of store rent was calculated to be SD10, which constituted 8.70% of the total storage and feeding cost per head.

Marketing costs analysis transported by truck from Elfasher to Elmoueleh/Darelsalam livestock

Table 3 showed the total marketing costs of sheep at different marketing levels (SD/head) transported by truck from Elfasher to Elmoueleh/Darelsalam livestock markets. The results revealed that, the truck rental cost (SD 2050) was the most important cost items at the producer level. It constituted 41.11% of the total marketing cost per head. This could be due to the high risk of moving animals in western Sudan, arm-robbery, poor infrastructures and shortage of trucks specialized in animal transport. The second highest cost items was taxes, fees and veterinary charge (government payments) which constitute 10.52% of the total marketing cost per head. The reason is direct and indirect taxes and multiple fees imposed on producers and traders by the government along the roads. High taxes and multiple fees restrict the volume supplies affecting the sheep price level and net farm income.

Loading and unloading cost of sheep constituted 8.41% of the total marketing cost. This process was sensitive and needs highly specialized and skilled labor. The fourth and fifth cost items were losses or mortality at wholesale and producer levels which constituted 7.44 and 6.58% of the total marketing cost per head, respectively. Poor infrastructures, unskilled labor, lack of adequate animal feed and water were the major factors increasing losses and mortality cost. High losses or mortality at the wholesaler level is due to the fact that wholesalers received large numbers of sheep at one time. Therefore, they need good management and services to ensure control over his herd. Any shortage of these factors

Table 3. Total marketing cost (SD per head) of sheep transported by truck, from Elfasher to Elmoueleh/ Darelsalam livestock (2004).

Cost item	Producer level	% of total marketing cost	Wholesaler level	% of total marketing cost	Retailer level	% of total marketing cost
Truck rent	2050	41.11	-	-	-	-
Loading/unloading	400	8.41	-	-	-	-
Losses of mortality	2%,313	6.58	2%, 354	7.44	1%,188	3.95
Taxes, fees and veterinary charge	500	10.52	175	3.68	125	2.63
Feeding + herd man	105	2.21	105	2.21	105	2.21
Water charge	5	0.11	5	0.11	5	0.11
Storage	-	-	10	0.21	10	0.21
Commissions	100	2.10	100	2.10	100	2.10
Marketing cost	3473	73.04	749	15.75	533	11.21
Total marketing costs						4755

Source: field survey, 2004.

Table 4. Sheep marketing margins (SD/ head).

Marketing level	Big size			Medium size			Small size		
	Buying price	Selling price	Marketing margins	Buying price	Selling price	Marketing margins	Buying price	Selling price	Marketing margins
Producer	-	18500	-	-	16000	-	-	11500	-
Wholesaler	18500	21000	2500	16000	18000	2000	11500	13000	1500
Retailer	21000	22500	1500	18000	19500	1500	13000	14000	1000

Source: field survey, 2004.

increases the cost of losses or mortality. Nonetheless, sheep feeding, water and commission were the same for all traders. Generally, most of the cost items incurred during the marketing of sheep, such as taxes, fees and truck rent were paid on per head basis. Therefore, small size of sheep is highly affected, because they share other sizes with similar cost and fetch less prices.

From the table, the producer shared high percentage in total marketing costs (73.04%), while wholesalers and retailers shared only 15.75 and 11.21% of the total marketing costs.

Marketing margins at wholesaler level

Table 4 showed the marketing margins for different marketing levels of sheep (SD per head), transported by truck, from Elfasher to Elmoueleh / Darelsalam livestock market. Animals were classified into three categories according to their sizes (big, medium and small). This classification was based on traders' point of view, and the prices taken in this study were average market prices at the time of sale. The marketing margins measure the difference between selling and buying prices. For wholesalers, they were found to be SD 2500, SD 2000 and SD1500 for big, medium and small size of sheep, respectively (Table 4). The retailer marketing margin measured the difference between the price that the retailer paid and the price that the retailer charged the consumer. From Table 4, the margins at the retailer level were SD 1500, SD 1500 and SD1000 for big, medium and small size of sheep, respectively.

From the results, both traders got high marketing margins with higher margins noticed at the wholesaler level than at the retailer level. These results were in agreement with the results of a previous study. Rapsomanikis et al. (2003) recorded that in developing countries, poor infrastructures, namely transport and communications services, give rise to large margins because of the high costs of delivering the products for consumption. High prices are thus retained at the consumption areas despite their relatively low levels at the production areas, and vice versa.

RECOMMENDATIONS

Based on the finding of the study, the following recommendations are drawn: High marketing cost is the main cause of the imperfections of sheep marketing performance. However, marketing cost can be improved by transportation, which is a significant segment of marketing cost. Thus, the following means are suggested to reduce transportation cost:

(a) Improving infrastructure such as roads, markets, etc.
(b) Utilization of a large specialized truck, suitable for physical characteristics of animals.
(c) Establishment of risk control units in areas where arm robbery and violence exist.
Physical losses or mortality cost can be reduced by using the following:

(i) Provision of animal feed and water at the market throughout the year.
(ii) Improving loading and unloading practices by labor training.
(iii) Government should reduce the taxes and fees imposed on producers and traders.

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