

Desert Sheep in Kordofan Area – Sudan: Production and Marketing

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ABSTRACT : This study was carried out to examine the traditions and beliefs of desert-sheep producers, identify and analyze sheep production costs and returns according to the prevailing preferable sheep selling age and to determine the marketing channels and margins. Accidental sampling was used to collect data from 115 respondents (sheep producers/traders) from Gibiesh market in Western Sudan and 30 traders and middlemen from Omdurman central market. Simple statistics, partial budget and market analyses were used to pursue the stated objectives. The results revealed that according to farmers' traditions, the selling season of sheep extends from August to February while the best age for selling (both males and females of sheep) was 24 months. The major sheep production cost items, in descending order of their values, were drinking water, salt, labor, animals feed, veterinary care and medicine, fines paid to individuals, flour, taxes and zakat, with each contributing substantially to total costs. Generally, there are two means merchants used in transporting sheep from production area (Gibiesh market) to the consumption areas; on hoof trekking and by trucks. Although the latter takes shorter times to reach the final destination, trekking was more preferred by producers, having the advantage of animal fattening through grazing en-route and around Omdurman if not sold for some time. They only resort to truck transport when they have short-time delivery obligations or when transporting young animals. The marketing channels were so lengthy and middlemen's margins were almost equivalent to those of producers. The study recommends establishing farmers' institutions or associations, encouraging researches for pasture improvement, providing sheep producers/traders with low-costs veterinary care and medicines, and reducing or waiving their taxes in selling specified percentage of their sheep.

KEY WORDS: Desert sheep, producers' beliefs, production costs, marketing channels and margins.

INTRODUCTION

Sudan is well endowed with livestock resources. In 2007, the total Sudanese livestock population was estimated at 139 million heads, comprising 41, 51, 43 and 4 million heads of cattle, sheep, goats and camels, respectively (Table 1). The average annual growth rate of the livestock sector was estimated at 3.1% (Faki *et al* 2009). This population figure puts the Sudan as a leading livestock producer in Africa and the Arab countries.

Table 1. Sudan's total livestock numbers by state in 2007 (000 heads)

State	Cattle	Sheep	Goats	Camel
Northern States	428	1955	2323	146
Kordofan States	6594	10049	6248	1560
Darfur States	8783	11194	9296	1005
Eastern States	1497	3374	2970	1086
Central States	11375	11062	8626	435
Southern States	12226	12587	12837	0
Khartoum State	234	431	635	6
Total	41137	50651	42938	4238

Source: MARF (2007)

Within the livestock sector, sheep play a remarkable role in the livelihoods of Sudanese people, providing food, income and enriching the land with animal manure. In addition, it provides the country with foreign currencies; as mutton and live animals are

exported annually. About 5571 tons of mutton and 1.7 million heads of live sheep were exported in 2004 (MARF, 2005).

Sheep are predominately, about 90%, in the hands of traditional producers who mainly depend on natural pasture to raise their animals. In doing so, they convert marginal and unused land for agricultural production into sheep production. Despite the expected low cost of the traditional method of sheep production, sheep prices are relatively high compared with international sheep prices. In addition, prices of Sudanese sheep are constantly fluctuating between seasons and within the year. This could be attributed to remoteness of production areas from consumption centers (Faki *et al.* 1991), poor integration of traditional sheep producers in the market due to their traditions and beliefs, presence of large numbers of middlemen (Khalil 1995), and numerous and high taxes and levies imposed by different governmental institutions (Elrasheed *et. al.* 2008). Knowledge of desert sheep production and marketing is of paramount importance in providing policy makers with the necessary information to formulate the appropriate policies that will improve this sector.

This study aimed at examining producers' traditions and beliefs on sheep sales, identify and analyze production costs and returns for the prevailing

preferable sheep selling age and to determine marketing channels and margins.

MATERIALS AND METHODS

Greater Kordofan State and Omdurman were chosen to represent the study areas. Kordofan State was selected on account of being one of the major sheep producing areas in the Sudan, accommodating about 20% of the total sheep population in the country (MARF, 2005). Within Kordofan, Gibiesh market was chosen for data collection. Gibiesh is placed in an area focusing on the production of desert type (Hamari breed) of sheep. Gibiesh is the capital of Gibiesh locality and is characterized by its sandy soil and desert climate. Sheep producers from different parts of western Sudan who raise hamari breed visit this market. Desert breeds (hamari) have a high domestic and international demand (Elrasheed 2005). It is one of the leading export breed of Sudan's sheep. On the other hand, Omdurman was chosen because it is the livestock central market in the Sudan and, besides, represents the major domestic consumption center and the main animal assembly point for export. Both primary and secondary data were used to collect the required information, although primary field data was the main source. A total of 115 sheep producers/traders from Gibiesh and 30 livestock traders from Omdurman central market were interviewed by means of two questionnaires. Data collection comprised technical and economic aspects of sheep production and marketing and was undertaken in the 2001/02 season from Greater Kordofan State and Omdurman central market (*Alaamiria*).

Accidental sampling was used due to unavailability of producers' and/or traders' records in addition to the difficulty of producing a population list of all the diverse and considerably unsettled sheep traders and producers. Accidental sampling is a non-probability sampling technique characterized by saving in time and cost and has reasonable reliability when the population is homogenous (EIDafi, 2007) as the case with desert sheep (hamari) producers or traders in the study areas. Simple statistics, partial budgeting analyses and markets analyses were used to reach the stated objectives.

RESULTS AND DISCUSSION

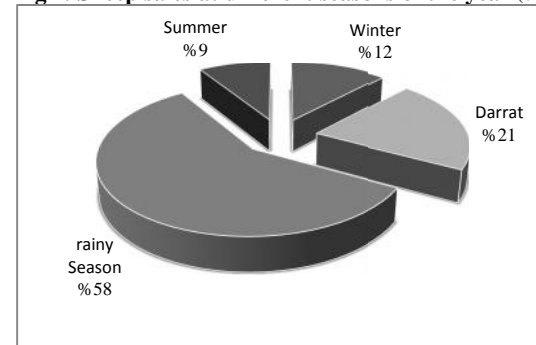
Many aspects pertaining to the production and marketing of sheep in the study area were considered. These include producers' tradition and beliefs on sheep sales, production and marketing costs and marketing channels and margins, in addition to the share of taxes, transportation and production costs in the total value of sheep.

PRODUCERS' TRADITION AND BELIEFS ON SHEEP SALE

Producers' preferable season for sheep sales:

Results of the survey revealed that, most of the sheep producers (58%) sell their sheep during the rainy season because at this time of the year they will be in need of cash after long journey away from home in search for pasture and water. The second preferable seasons for sale were Darrat which extend from the middle of September to December (21%) (Fig 1). The winter season was the third preferable season of sheep sales, in which producers sold 12% of their sheep. The standard deviations of all seasons were relatively low indicating consistency of the level of sales in each of these seasons.

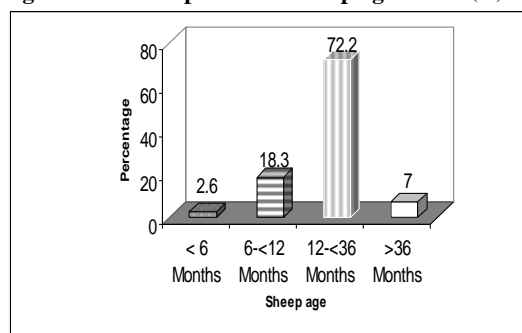
Fig 1: Sheep sales at different seasons of the year (%)



Source: author(s) field survey 2002.

Accordingly, the main selling season is expected to extend from August to February. Surely, this tradition and/or belief were negatively reflected on sheep sales and prices: high sales during rainy season and shortages during summer. So to counteract the expected fluctuation, incentives measures should be done to ensure continuous supply of sheep throughout the year.

Best age for sheep sales: Producers believe that the best age for selling sheep is 24 months (*raba*) (fig. 2) because at this age animals fetch high prices. The majority of the sheep producers (72.7%), therefore, retain their animals to reach such age without due consideration to cost factors and pasture carrying capacity. In contrast, Elrasheed et. al. (2008) found that the optimum quantity of sheep sales as well as its composition is very much more towards younger ages (6 - <12 months and <6) of both males and females. The overall result is additional costs incurred in the production of sheep being kept for extended periods of time.

Fig 2: Producers' preferable sheep age of sale (%)

Source: author(s) field survey 2002.

Transportation of herd from Gibiesh to the central market:

Generally, there are two methods sheep producers/traders use in transporting their sheep from Gibiesh to the consumption areas; on hoof-trekking and by trucks. According to Hamari sheep producers/traders, trekking is the most convenient means of moving animals from producing areas to consumption centers (Elrasheed 2005), where animals are usually driven during the wet (rainy) and cold (winter) months of the year (August to February). In trekking, sheep are usually transported to Omdurman central market in consignments. Each consignment is composed of a thousand heads. Depending on the market demand, the average numbers of consignments are two to three per year (Elrasheed 2005; Mohammed 2002). A consignment of 1000 heads is subdivided into three groups of 300-350 heads each. Two shepherds are assigned to drive one group, and there is one guide (*khabeir*) for 1000 heads. Also there is one labourer for carrying the needed materials and food cooking. The *khabeir* is responsible for the well-being of the sheep until they reach their final destination. He decides when to move, the speed of movement, and when to rest. Nevertheless, neither the *khabeir* nor the 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) (Table 5). The trip usually takes 40-70 days, depending on the conditions of the animals, the market from where it is bought, grazing conditions and water availability, and the weather factor (whether hot or cold). The majority of the sheep producers/traders (98%) prefer this method of transportation because it offers the opportunity of animals' fattening by grazing on natural pasture and, besides, it is a kind of store of

wealth on hoof. It is considered as one of the main features of livestock marketing in the 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 with trekking. But they resort to it only when their obligations of sheep supply falls due. In normal situation they do not prefer truck transport due to additional costs they 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.

PRODUCTION COSTS AND MARKETING CHANNELS AND MARGINS OF DESERT SHEEP

Production costs of Desert sheep: To derive the costs associated with raising and marketing of 2-year old ram simple statistical analyses were carried out with the results presented in Table 2. The total cost is composed of the cost of water, labour, veterinary care and medicines, animals' feed during times of natural fodder scarcity, flour, salt, zakat, taxes, and fines.

Table 2: Total costs of preferable male sheep age supplied to the market in season 2002, SDD/head/24 month

Cost items	Total cost	Percent of Total
Water	618.6	18.9
Labor	576.0	17.6
Veterinary care medicine	409.1	12.5
Animal feed	569.5	17.4
Flour	140.7	4.3
Salt	615.3	18.8
Taxes	78.6	2.4
Zakat	75.3	2.3
Fines	193.4	5.9
Total	3272.8	100.0

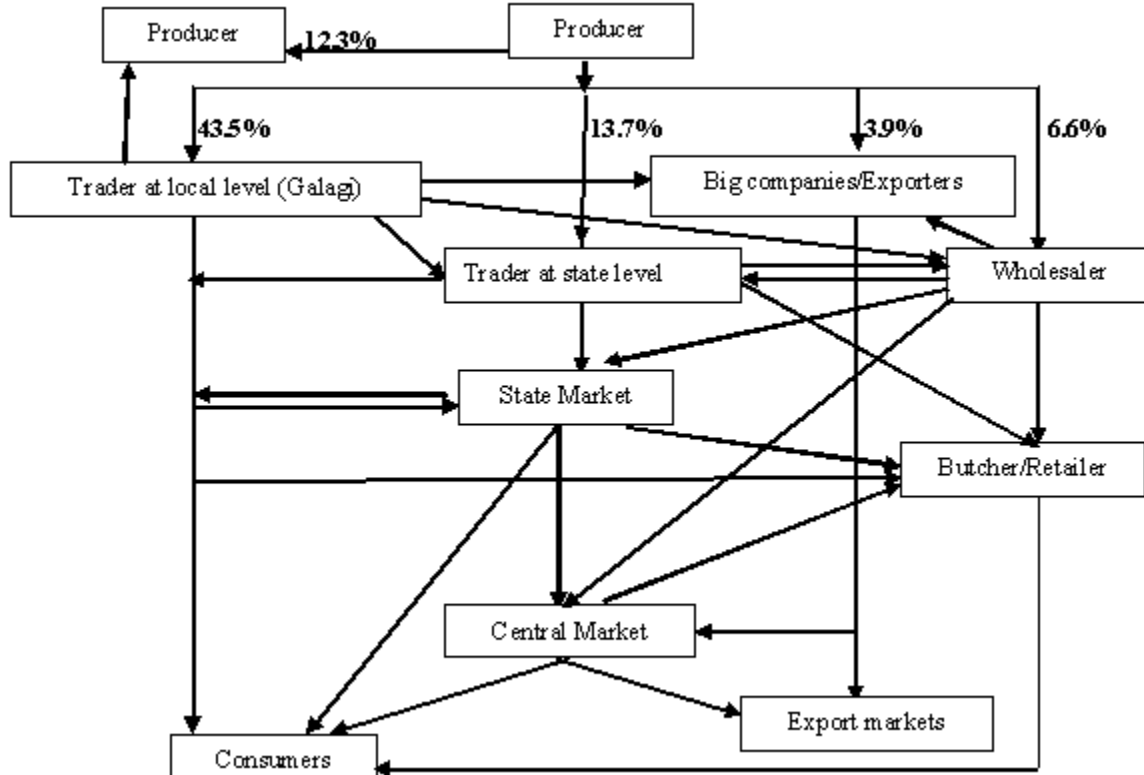
Source: author(s) field survey.

The average total costs of sheep production (24 months of age) using traditional methods were found to be SDD3273/head (one US\$= 210 SDD), which can be considered as reasonable compared with modern systems of production, although the later benefited from its location nearby big cities/towns to compensate for its high production costs. The major cost item of sheep production was drinking water and salt, contributing substantially (about 19% each) to the total production costs. The labour cost occupied the second position, contributing about 18% to the total costs. Although producers depend on natural pasture to feed their animals during the rainy and somehow winter seasons and resort to purchased feeds during summer and under poor environmental conditions,

still animals feed counted for more than 17% to the total costs. Veterinary care and medicine added significantly to the total costs (12.5%) as producers/traders usually rely on commercial medicines and veterinary cares. The three items of fines paid by individuals (5.9%), taxes (2.4%) and zakat (2.3%) together add to more than 10.5%, although Zakat is supposed to be voluntarily paid.

Marketing channels of Desert sheep: Marketing channels are the passage through which livestock flow from producers to the final consumers. In the Sudan the marketing channel is so long due to the remoteness of producing areas from consumption centers (Faki *et al.* 1991). The pattern of the marketing channels is presented in Fig. 3.

Figure 3. Marketing channels of Desert sheep in Sudan



Cost of moving Animals from Gibiesh to Omdurman: Trekking costs: trekking costs of moving desert sheep (Hamari) from Gibiesh to

Omdurman central market, during both rainy and winter seasons, were derived as presented in Table 3.

Table 3. Trekking cost from Gibiesh to Omdurman (SDD/head), season 2002

Item	Rainy season		Winter season	
	SDD	% of total	SDD	% of total
Guide	60.0	5.9	60.0	5.7
Shepherds	240.0	23.8	240.0	22.6
Feeding and drinking	00.0	0.0	50.5	4.8
Veterinary care	320.0	31.7	320.0	30.1
Others (food and drink for the guide and the shepherds)	50.0	5.0	50.0	4.7
Losses due to death and robbery	140.0	13.9	140.0	13.2
Taxes and levies	200.0	19.8	200.0	18.9
Total	1010.5	100.0	1060.5	100.0

Source: authors' field survey 2002.

Table 3 depicts that the total costs of trekking was relatively high (SDD 1010 during the rainy season and SDD 1060 during winter) when compared with truck transport. The highest among the cost items was veterinary care, forming 32% and 30% of the total trekking costs during rainy and winter season, respectively. Payments to the shepherds ranked second, contributing 24% and 23% to the total trekking costs during the two seasons, respectively. Taxes and levies and animals' losses due to death, robbery and/or animal missing have a substantial share during both seasons. The shares of these two items stood at about 34% and 32% of the total cost of the rainy and winter seasons, respectively. On the other hands, production costs of sheep trekked in winter slightly exceeded those trekked in the wet season. The difference is attributed to the additional costs incurred in purchasing animals' drinking water.

Trucks cost: Trucks are the second means of transporting sheep from Gibiesh to the consumption areas. They are usually used from Elkhewi or Elobied to Omdurman, because there is no direct paved road from Gibiesh. As mentioned before, producers resort to truck transportation when their sheep are young or they are constrained by specified time schedule. The distance from Elobied or Elkhewi to Omdurman takes 15-30 hours. The itemized costs per head of sheep transported by trucks are presented in Table 4.

Table 4: Cost of truck transport from Elkhewi or Elobied to Omdurman (SDD/head of sheep)

Item	SDD/head	Percent of Total
Truck payments	510.0	52.9
Shepherds	15.0	1.6
Losses due to death or other factors	150.0	15.5
Taxes and levies	210.0	21.8
Veterinary care	80.0	8.3
Total	965.0	100

Source: author(s) field survey 2002.

Table 4 showed that, the truck freight was the most expensive item, constituting about 53% of the total cost from Elkhewi or Elobied to Omdurman. This is consecutively followed by payment of taxes and levies (22%), and animals' losses due to death, robbery and/or missing animal (16%). However, it is worth mentioning that the mortality rate of using this method of transportation is relatively low (2%) compared with trekking (5%).

Costs of keeping sheep in the central market for sale: Usually sheep are stored on the hoof in the surrounding areas of Omdurman. The average

number of days during which animals kept for sale in the central market was found to be 10 days. The cost of keeping animals during that period was composed of animals' feed, drinking water and labor (Table 5).

Table 5. Cost of keeping sheep in the market till selling time (SDD/head/day)

Cost Item	SDD /head/ day	Percent of Total
Feed	50.0	86.2
Drinking water	5.0	8.6
Labor	3.0	5.2
Total	58.0	100

Source: author(s) field survey 2002.

The highest portion of the cost of keeping sheep in the market was the feeding cost of SDD 50/head/day (86%). Others were drinking water SDD 5 and labor cost SDD 3/head/day. Taking in consideration the average number of days animal are kept in the market for sale (10 days), the total cost will be $58 * 10 =$ SDD 580/head.

Marketing margins: The average price for the 24-months old male sheep in Omdurman central market, which was used in the calculation of the marketing margins of sheep in the Sudan, was SDD 14,000 (Table 6). The average cost of transporting animals (trekking during the rainy season, trekking during winter and truck transport) was used in the calculation of the marketing margins.

Table 6: Marketing margins of sheep (SDD/head)

Item	LS /head	Percent Share
Cost of raising animal	3272.8	
Producer price	8115.5	
Producer margin	4842.7	53%
Cost of transportation and waiting in the market	1592.0	
Total cost of animal till it reaches the central market	9707.5	
Central market prices	14000.0	
Middlemen margins	4292.5	47%
Total margins	9135.2	100%

Source: author(s) field survey 2002.

The results showed that, producers get reasonable and encouraging returns to remain in business (SDD 8115.5). In fact, the profits gained by the producers/trader were relatively good when compared with the production costs (SDD 3272.8). On the other hand, the middlemen's share in the marketing margins (47%) was almost equivalent to that of producers (53%). This surely would be harmful

to sheep marketing as sheep prices shoot up due to the increasing marketing costs.

RECOMMENDATIONS

The following recommendations can be inferred from the study:

- Incentives measures should be in place to ensure continuous supply of sheep throughout the year at reasonable prices, such as, tax waiving, provision of low-cost veterinary cares, medicines and animal feed on selling specific percentage of sheep.
- The government should encourage researches to improve pastures by means of introducing varieties of grasses with high water, oil and salt content, tolerant to severe environmental conditions and palatable to animals, besides developing and maintaining the existing improved ones.
- Sheep producers/traders institutions and associations should be encouraged in order to shorten the marketing channels.
- Livestock passage should be well marked and equipped with drinking water (wells) and security points.

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