

**Camel Pastoralism in Butana region, Northeastern Sudan:
constraints and future strategies for development**

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Abstract

Butana region occupies the centre of the northeastern Sudan in an area extending over 120,000 km² representing one third of the area of Eastern Sudan. It holds 25.7% of the national Sudan camel population. During the last two decades, several field research studies were conducted in Butana region involving different research subjects and disciplines. This article reviews the findings of field research conducted in Butana with special emphasis on the constraints and limiting factors affecting the growth and development of camel husbandry in the region.

These constraints included shortages of veterinary services, diseases and animal health ailments, particularly parasitic diseases and camel calf diarrhoea, lack of pasture and water resources, recurrence of drought, security problems and reduced herd fertility. Other constraints included lack of enough capital for investment, labour problem and marketing shortages for camels and camel products. The article also discussed the pathological effects of common diseases encountered among camels in the Butana region, particularly skin and parasitic diseases. Moreover, the effects and drawbacks of these constraints were mentioned and discussed, and, some strategies for future improvement of camel husbandry in the region were proposed.

Introduction

Camels (*Camelus dromedarius*) are mainly reared by nomadic pastoralists mostly in marginal ecozones of semi-desert lands in sub-Saharan areas. Thus, camels have a vital role in the subsistence economy of large sectors of rural pastoral communities. Camel nomads are inhabiting a wide geographical area extending from the Gobi and India in Central Asia in the east, to Mauritania in the west, with a considerable population in Somalia, Kenya and Ethiopia in the Horn of Africa. The camel pastoralists are always moving over large areas in search of food and water for their camels. During their continuous transhumance, camels are affected by many production-limiting factors such as diseases, range and pasture limitations, water scarcity, high calf mortality and, recently, security problems (Novoa, 1970; Monod, 1975; Niamir, 1991; Abbas and Musa, 1986, Abbas and Omer, 2005; Ali and Majid, 2006). In this communication, constraints of traditional camel herding practice in northeastern Sudan, as conceived through research conducted in the area during the last two decades, are discussed. Also, future strategies to alleviate and solve these constraints for the welfare of camel nomads and pastoralists are proposed.

Camels of Butana region, northeastern Sudan

In Sudan, camels are concentrated mainly in the eastern and western regions of the country. It is estimated that more than 60% of the Sudan camel population is found in Western Sudan, whereas 25.7% of the country camel stock is found in the Eastern region of Sudan (Department of Animal Resources Statistics, 2006). Butana area occupies the centre of the northeastern Sudan in an area extending over 120,000 km² representing one third of the area of Eastern Sudan (Map 1). The topography of Butana land is characterized by easily flooding uniform plains composed predominantly of

clay and sandy soils. Most of Butana area lies within the low rainfall savannah with a smaller portion extending into the semi-desert agro-ecological zones of Northern Sudan (Darrag, 1989). During the rainy season, most of the camel herds in Eastern Sudan range predominantly in central Butana due to the availability of pasture and water resources (Abbas *et al.*, 1992). Soon after the end of the rainy season and due to the scarcity of drinking water, despite the availability of good pasture resources, camel herds move out of central Butana towards the east and east-north to utilize the crop residues in the irrigated and rain-fed agricultural sorghum schemes. Being close to the capital of Sudan and due to its easy accessibility besides the high accumulation of camels, Butana region constituted a virgin and very suitable area for research on camels during the last two decades. In Butana area, several authors have conducted intensive field studies and research on different disciplines of camel science (e.g. Abu Sin, 1986; Abbas and Musa, 1987; Fadl *et al.*, 1989; Mohamed and Ahmed, 1991; Saint-Martin *et al.*, 1991; Kohler-Rollefson *et al.*, 1991; Abbas *et al.*, 1992; Agab, 1993; Ali and Majid, 2006).

Constraints of camel production and strategies for improvement in Northeastern Sudan

As it appears in Tables 1 and 2, lack of veterinary services accompanied by disease problems were the most commonly encountered problems facing camel pastoralists in Northeastern Sudan. Other constraints included skin diseases, namely tick infestation, mange and contagious skin necrosis were the commonest veterinary problems affecting camels in the northeastern Sudan. Moreover, lack of pasture and water resources, recurrence of droughts, parasitic diseases, camel calf diarrhoea and reduced fertility of female camels were extra limiting factors.

Pastoralists in the northeastern Sudan, usually adopt a highly mobile grazing system. On average, they move for 30 to 600 km during the year (Abbas *et al.*, 1993). In the nearby and across the borders, camel pastoralists of Eritrea practice the same long migratory annual movements which vary from a few distance to several hundred kilometers (Banerjee, 2006). Therefore, for better development perspectives, the elimination of migration and extensive rearing could improve many issues directly related to them such as poor nutrition and higher mange morbidity which is always associated with migrating herds (Agab and Abbas, 1999). The encroachment of irrigated and rain-fed cultivated crop schemes on pasture land areas is a good reason to investigate into alternate methods of large scale rearing of camels (Laval *et al.*, 1998). Previously, land allocation for pastoralists utilization in the form of small irrigated plots (hectare/family) to be developed as “nomadist refugees” in the face of drought recurrence has been suggested (Abbas, 1992).

Camel calf diarrhoea is an acute, subacute or chronic gastroenteritis predominantly affecting suckling camel calves. The disease was a significant cause of calf mortality and, therefore, was considered as one of the major limiting factors for growth and development of camel herds and camel population (Abbas, 1992, Agab, 1993; Abbas *et al.*, 2000). More efforts and attention should be paid for investigation of this constraint that has a widespread prevalence and is of considerable economic significance.

Helminths problem exhibited major significance throughout the field surveys conducted in northeastern Sudan causing appreciable mortality (Fadl *et al.*, 1989; Agab *et al.*, 1992). Pastoralists complained that they were never able to have enough anthelmintic medicines and that they received little or no advice in regard to worm control procedures (Abbas *et al.*, 1993). The

high need of camel pastoralists in northeastern Sudan to animal health services is clearly manifested by their wealthy knowledge in ethno-veterinary practices (Agab, 1998; Abbas, 1998). Therefore, the veterinary services provided to the camel pastoralists in Northeastern Sudan should be strengthened and made available to these needy people (Table 3).

It is clear that lack of security was a worrying problem for a large proportion of camel nomads in Eastern Sudan mainly due to the bands of armed people often attacking and robbing small groups of camel herders. Also the conflicts arising from friction between pastoralists and farmers exploiting large fields in rain-fed agricultural schemes in Eastern Sudan (Abbas *et al.*, 1993; Abbas and Omer, 2005).

Lack of drinking water constituted a serious problem to 36% of the camel pastoralist in Butana, particularly during the dry summer season, as most of the people had to rely on rain water for their camels. Therefore, immediately after the end of the rainy season, camels had to pull out of Butana leaving behind a good range land because of lack of drinking water. Thus, to let the camel pastoralists utilize the available range resources during the dry season, tube wells in these sites had to be repaired as well as digging and establishing additional surface water resources and reservoirs.

Other constraints to camel production in Butana region included lack of enough capital for investment, labour problem and marketing shortages (Abbas *et al.*, 1993). These constraints may indicate that changes from subsistence to commercialization was already well advanced in the area (Abu Sin, 1991). Thus, it would be expectable that labour and capital constraints would assume more significance in the future if the more pressing problems of pasture, veterinary services, security and water shortages received proper attention (Abbas *et al.*, 1993).

It was clear from the previous investigations conducted in Butana region that camel pastoralists were well aware of the factors affecting and interacting their camel production process. Therefore, these factors should be addressed in any effort aiming at increasing camel productivity in northeastern Sudan. Moreover, this review calls for selective and corrective actions aimed to improve the livelihood of camel owners and camel nomads in Sudan. It is highly required to encourage camel pastoralists to form an association or a union as a favourable factor towards more practical and well planned actions for improving the living conditions of camel nomads.

Dromedary camels of western Sudan, on the other hand, despite their larger population compared to Butana, had less than 5% of the field research conducted in Butana region (Majid, 2000). Therefore, it is highly justified to draw the attention of researchers and donor organizations to shift some of their camel research activities to western Sudan in order to identify the dromedary husbandry systems and explore the constraints facing camel growth and development in that heavily camel-populated part of Sudan.

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Table 1. Summary of constraints to camel production in northeastern Sudan.

	Constraints	Percent Responding					
		Problem Grade					
		First	Second	Third	Fourth	>Fourth	Total %
1	Veterinary services:	43.6	23.5	10.3	5.4	4.8	88
	a- Skin diseases	23.6	8.7	12.1	13.3	23.5	81.2
	b- Digestive diseases	4.1	25.9	16.4	12.6	26.6	75.6
	c- Neonatal mortality	7.4	8.6	8.3	5.6	13.5	43.4
	d- Respiratory diseases	1.6	3.8	6	4.1	13.1	28.6
	e- Infertility	-	-	-	-	-	11.1
2	Pasture	25.8	14.5	9.5	6.6	16.3	72.7
3	Security	6.8	11.9	9.9	10.3	28.3	67.2
4	Water	7.5	8.4	3.4	1.6	15.1	36
5	Marketing	-	-	-	-	-	10.2
6	Capital	-	-	-	-	-	9.5
7	Labour	-	-	-	-	-	7.9

(Source: Abbas *et al.*, 1993).

Table 2. Diseases and number of animals affected during one year study (March 1991 – February 1992).

No.	Disease condition	Summer	Autumn	Winter	Total (%)
1	Mange	218	713	239	1170 (11.1)
2	Helminthiasis	374	358	135	867 (8.2)
3	Wounds and abscesses	111	163	41	315 (3)
4	Night blindness	276	0	5	281 (2.7)
5	Ringworm	106	61	50	217 (2.1)
6	Neck-pain and “ <i>Haboub</i> ”	101	78	34	213 (2)
7	Respiratory diseases	51	84	29	164 (1.6)
8	Mastitis	56	77	24	157 (1.5)
9	Contagious skin disease	43	31	22	96 (1)
10	Lameness	40	43	12	95 (1)
11	Calf diarrhea	73	11	7	91 (0.9)
12	Contagious ecthyma	0	65	0	65 (0.6)
13	Trypanosomiasis	4	41	9	54 (0.5)
14	Abortion	26	18	7	51 (0.5)
15	Eye affections	2	24	3	29 (0.3)
16	Bent-neck syndrome	15	7	1	23 (0.2)
17	Snake bite	11	6	2	19 (0.2)
18	Poisoning	2	11	0	13 (0.1)
19	Adult diarrhoea	1	2	2	5 (0.03)
20	Camel pox	1	0	2	3 (0.02)
21	Fracture	1	0	1	2 (0.01)
22	Pharyngitis	1	0	0	1 (0.01)
23	Metritis	1	0	0	1 (0.01)
24	Ear affections	1	0	0	1 (0.01)
25	Papilloma virus infection	1	0	0	1 (0.01)

(Source: Agab, 1993).

Table 3. Proposals for solving problems and constraints to camel production in Buatan region, northeastern Sudan.

S. No.	Constraint	Proposals for solving the constraint
1	Veterinary services	Arrangement of extension services; veterinary education and training; de-worming programmes; improving general veterinary services as well as assurance of continuous presence of the veterinarians and/or paravets in the field.
2	Infertility in female breeders	Efforts should be made to improve fertility of female camels and reduce age of first calving and calving interval e.g. male or female factors; environmental or nutritional effects.
3	Pasture	Stop acquisition of camel range land by private farming enterprisers; pasture improvement; allocation of range land; establishment of co-operative ranching systems.
4	Water	Securing enough and long lasting water resources in Central Butana.
5	Security	Combating robbers and provision of security to camel pastoralists.
6	Marketing	Camel pastoralists need help to market their camels and get acceptable and reasonable revenue e.g. fattening projects; camel milk production in the vicinity of provincial capitals.
7	Capital	Supply camel pastoralists with credits and loans.
8	Labour	Encourage pastoralists to work on camels through provision of some essential services such as education and human health services.