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Camel Pastoralism as a Food System in the Sudan: Limitations and Changes

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This paper endeavours to outline the camel pastoralism production system in the Sudan, and examines whether it can exist as a food system within itself; or, if it has to work in close coordination with other production systems in and out of its locality. The main emphasis is on the limitations of the system and the patterns of change which are taking place. The major use of the camel is as a store of value rather than as a food system.

Introduction

The dry lands of Sudan are witnessing a disintegration of subsistence economies and a growing food insecurity which is gradually becoming a long-lasting phenomenon rather than a transitory one. The subsistence economies of these areas are mainly based on pure pastoralism or agro-pastoralism depending on the amount of rain precipitation and the quality of soil, as well as the indigenous knowledge accumulated by the local inhabitants. Under the circumstances of recurrent droughts and the resultant pressure on land, where carrying capacity has become deteriorated over the years, food insecurity has become a common feature in both pastoral and agro-pastoral systems. Food insecurity here refers to a situation where "a country and people can be said to be food secure when their food system operates efficiently in such a way as to remove the fear that there will not be enough to eat" (Maxwell, 1988).

It is against this background that the role of camel pastoralism as a food system in the Sudan is examined. Within this frame of reference the complexity of the socio-economic factors underlying a situation of food insecurity has been emphasised. The issue of marginalization of pastoralists, though it will not be dealt with in detail in the present

discussion, has to be kept in mind constantly as a necessary constraint on the performance of the system. The fact that food security at the household level, specially among camel pastoralists, is dependent on their ability to work complementarily with the surrounding production systems, is a major issue for the pastoral system continuity.

The Place of Camel Pastoralism in Sudanese Society and Economy

The camel has played a conspicuous and extremely significant role in the development of Sudanese communities whose natural environment has allowed it a chance for adaptation. The early record of its domestication dates back nearly 2500 years, and its introduction to north-eastern Sudan has had a significant impact on the social transformation of the nomadic communities of that time (Kheir, 1988). The war-like, highly mobile and predatory nature of the pastoralists was enhanced through the efficient utilization of the characteristics of this animal. Combining this with the extensive knowledge they had of desert routes, the relation of the nomads of north-eastern Sudan to the States at that time became a mirror images of what Ibn Khaldun described as the historical role of the nomads in his "Muqaddimah" (Ibn Khaldun, 1967). The

nomads used their camels to organize and protect caravans as well as to plunder settlements. They became part of the State army during the Meroitic State leading to an emergence of a pattern of having a camel mounted corp in the Sudanese State which survived until recently.

Camels in the Sudan have become a major support of the caravan industry and an early contributor to trans-boundary trade. However, it has to be emphasized that camel breeding has gone through different stages of transformation. It has moved from being an effective tool of expressing dominance and force in the early days of its domestication to an important factor for subsistence under a dominant state power, and then to the emerging trend of commercial breeding in a market economy.

Camel breeding in the Sudan had for a long time been confined to the ecological zone between latitudes 10°N and 14°N. Latitude 14°N was considered the arbitrary dividing line between camel herders and other livestock owners. These are areas where rainfall is less than 300mm per annum. This means that camels have traditionally survived in the desert, semi-desert and the northern fringes of the low rainfall woodland savannah east and west of the Nile, where they met negligible competition from other types of livestock (El Amin, 1979; Abu Sin, 1988). Many factors made this zone suitable for camel adaptation. First among these factors is the relation between the zone's harsh conditions and the physical metabolism of the camel. In addition, for this highly selective grazing animal the wide range of vegetation cover promoted extensive movement.

The recurring droughts over the past two decades, however, have forced camel herders to move south to traditionally less hospitable zones, where there is a high risk of losing significant portions of their herds over time. This condition has been aggravated by national planning policies that have neglected pastoralists in general and camel herders in particular (Ahmed, 1976; Salih, 1987).

While camel pastoralism traditionally involves long range movements and high dependency of households on camel products for subsistence, the above mentioned changing conditions have led to an emergence of new adaptive strategies. The most conspicuous among these is the increasing dependency among camel pastoralists on small animals to meet basic food and daily cash needs while maintaining the camel as a capital reserve. Though this system may have slowed the off-take rate for camels, it has had a negative impact by overstressing the family labour and reducing its herd management ability. At the same time, these subsistence herders have been severely struck by the more recent drought starting in 1984, and are finding it difficult to restock.

New systems emphasizing the separation between herds and families as part of the herd management strategy, begun to dominate over the traditional family herd system. Under these circumstances hired herders have begun to take over herds of families that are short of young males who can undertake the task. Those engaged in such a system of hiring herders are mostly well-to-do pastoralists who can maintain two types of herds, i.e. camel herds and small ruminants. While they secure their food needs from the small ruminants they are storing their savings in the camel herds which are relatively more durable in the changing natural environment. These pastoralists only draw on such stores when other alternatives become impossible to obtain.

The agricultural planning of the rainfed areas, on a national level, has led to the settlement of some of the elite groups among the pastoralists. However, these elites have maintained their links with their traditional system and have always availed their crop fields to their family and relatives' herds after harvest. Consequently, an agro-pastoral system has begun to emerge. The significance of this new system to the camel herders lies in that it is giving them a chance to become a new entrepreneur group which is breeding camels for the market rather than

for subsistence, as well as allowing the concentration of the animal herds in the hands of a few persons. The newly emerging system is directly oriented toward the export system and making the camel a marketable and exportable commodity rather than a subsistence food animal. Tables 1-3 illustrate the numbers of camels in relation to the rest of the livestock sector and also show their contribution to the domestic meat production. A warning, however, has to be given concerning the statistics in the livestock and agricultural sector in the Sudan, as the methodologies being used lead to creation of fallacies rather than establishing facts. Hence, the camel numbers and their contributions in the regional and national—subsistence or market sectors—have to be taken with care. The present suggested figure for the total camel population ranges between 2.7-3.0 million and is based on the animal census of 1976 (Watson et al., 1976), with a suggested rate of growth of 3.1%. This figure does not take into account the loss of animals due to the drought conditions of the 1980s. Regard to export, it is estimated that between 50,000 and 60,000 camels go to Egypt on a quota system, while 10,000 are sold to Libya annually. However, more camels are smuggled into both countries regularly. Saudi Arabia, for example, has developed a market for light weight racing camels supplied by Sudanese traders (El Amin, 1984; Khalifa, 1988).

Camel Pastoralism as a Food System in the Sudan

It has already been indicated that camels are recognized by pastoralists as a store of value in a harsh environment. Yet their contribution to the pastoral household food intake is still significant. The point which needs to be emphasized here is that camel pastoralists have to complement their food system through relations with other systems. The contribution of camel milk and meat production for domestic consumption will now be examined, along with the relevance of the cash income generated from their sales to the daily needs of the household.

Concerning the camel herd production of milk, it can be noted that it represents a critical proportion of the herders food and water supply source. However, certain problems are involved in this area. The major problem is the separation imposed on the households and the camel herd during the annual migration. It is very difficult for herders and families to be at the same place to warrant effective utilization of the available milk due to the deteriorating state of the grazing areas. In response to such long distance migration such as *gizzu* (Asad, 1964), this operation may extend over four months and the milk can only be used by herders, some of whom may be hired by the owners' household members.

Table 1. Livestock numbers per 1000 head

animals/years	1983-85 (average)	1986	1987	1988
sheep	20,366.33	20,600	19,000	18,500
goats	14,845.67	15,581	14,000	13,500
cattle	21,584.67	22,389	22,400	22,500
camels	2,780.33	2,705	3,000	2,850

Source: Yearbook of Agricultural Statistics, vol.9, Arab Organization for Agricultural Development, Khartoum, Dec. 1989

Table 2. Camel distribution by region in the Sudan

Region/Province	1985/86	1987/88	1988/89
Northern	191,953	192,641	193,334
Eastern	762,303	765,034	767,788
Khartoum	15,788	15,844	15,901
Central	300,719	301,795	302,882
Kordofan	980,569	984,081	987,623
Dar Fur	423,059	424,573	426,102
Upper Nile	5,654	5,674	5,694
Equatoria	32,668	32,785	32,903
GRAND TOTAL	2,712,713	2,722,427	2,732,287

Source: Animal Resource Economic Administration, Ministry of Agriculture. Estimates based on a growth rate of 3.33%

Table 3. Meat production in the Sudan (100 M.T.)

Animals/Years	1983-85 (average)	1986	1987	1988
Beef	310.57	335.00	315.00	320.00
Mutton	131.93	137.00	140.50	143.58
Camel meat	55.60	55.13	56.25	60.03

Source: Yearbook of Agricultural Statistics, vol.9, Arab Organization for Agricultural Development, Khartoum, Dec. 1989

Another issue related to the proper utilization of fresh milk as part of the food system of the household is that camel milk has to be used in a short time span since it turns sour very fast. There is not an indigenous technology to process it into more durable commodity. Ghee or cheese of camel is something not heard of in the Sudanese pastoral communities. Furthermore, the milk pro-

duction of a camel is rather limited due to a number of factors. First, the bodyweight of a suckling calf is between 45-50 kg., while the milk production of the mother may not exceed 4-7 kg. per day. If this production is to be shared between the household members and the calf, many calculations have to be made in order to set a proper management strategy. Secondly, there exists no

proper system of calf management, e.g. keeping the calf away from the mother to avoid excessive milk off-take.

This lack of management system is perhaps due to the fact that milk is the only source of water for most of the year for the calf, as camels are primarily ranging over waterless areas. The main characteristic of camel milk composition is that 86% to 90% of it is water (El Amin, 1984).

Camel pastoralists are noted for their combined use of goat, sheep and cattle milk. Ironically, they keep the best milking breeds of goats, sheep and cattle in areas where diversification of herds became possible after the move south of the traditional camel habitat.

One final point concerning the efficient utilization of milk production of camels relates to one major inhibiting social factor among most of the camel pastoralists in the Sudan. Among the majority of the camel pastoralists women do not milk camels, but they can do so with other domestic herds. There are also extreme cases, as the Beja of the Red Sea Hills, with women traditionally not allowed to milk any of the livestock herds.

When it comes to meat production it has to be noted that, due to the size of the camel, it is not slaughtered for household daily consumption. The preference here is for small ruminants which can be consumed in a short period. A household might, however, slaughter a camel for festivities and in such circumstances the consumption is shared by those who happen to attend the occasion. One major factor in the preference for the slaughter of small ruminants is that camel meat does not keep well even after drying or cooking due to the presence of unsaturated fatty acids.

Considering the characteristics of camel meat itself, it has to be noted that the bone-muscle ratio is high. Some studies have "stated that the dressing percentage varies between 52.8 and 76.6 percent; fat between 0 and 4.8 percent, and bones between 15.9 and 38.1 percent" (El Amin, 1984:45). In addition, camel meat is rather tough because

of excessive mobility and the fact that animals are slaughtered beyond the age of maturity which is reached at 5-7 years.

On the national level the preference for camel meat is low due to the availability of other alternatives which are tenderer. Among certain pastoral and agro-pastoral groups there are taboos against eating camel meat, e.g., the Sabha group whose explanation of such an attitude is related to mythical advice from their ancestors.

Though it may seem that there are many constraints on the contribution of camels to the daily food needs of a household, it has to be emphasized that its role is prominent. Due to the advantage it has in its market rate, a sale of a camel provides a household with the cash needed to purchase sorghum and other commodities for its domestic consumption over a long period of time. However, since the camel is the least risky animal under the harsh conditions facing pastoralists, the tendency over the past two decades is to aim for herd diversification. This allows the household to sell or slaughter small animals and keep the camel as a store of value. A popular saying in this connection among the camel herders of north western Sudan is very revealing. It states that "sheep is the garment for camels" meaning that they protect this highly valued animal for later slaughter or sale.

The southward migration out of the traditional camel ecological zone has offered a new opportunity to the camel pastoralists. They are, in addition to herd diversification, gradually involving themselves in subsistence farming. This can be illustrated by the case of the Rashaida in eastern Sudan. As part of this changing trend the returns from the sale of camels are used for trade in other livestock which can be fattened on the agricultural by-products before being put for sale again. Together with the change in the pattern of migration due to the national agricultural policies, the above mentioned trends enhanced the subsistence-commercial farming that some entrepreneurs have started to adopt. This is gradually being followed by settlement families of the

household heads along with attracting their poor relatives to be associated on a lesser degree with this new form of adaptation. The poor household members may engage in selling their labour under the new system and allow their few camels to be cared for by male herders from the household, or arrange for a shared herding system (where an individual male member may engage for part of the year), or give their few animals to a hired herder who groups them with other animals he is caring for. This changing pattern within the camel pastoral system is working simultaneously with a process of consolidating camel herds in the hands of a few rich households. It has to be remembered that such trends and processes have to be seen within the context of the changes forced by the recent drought and by the fact that camel reproduction is slow. Many groups have not succeeded in replenishing their herds after recurrent droughts (cf. Hjort and Dahl, 1991).

Initially, the process of consolidation has led to new breeding practices. It created a trend towards breeding of light camels (racing camels) which are fetching very high prices in the Saudi Arabian market. However, this process, by no means, has dominated the situation. Even though the pressure is mounting on marginal camel pastoralists households, the traditional way of breeding their pack and meat camels is still in progress.

The camel's ability to generate income for the household is increasingly being utilized. The returns from these activities are used to purchase household needs, primarily sorghum. Other activities include transporting wood fuel and charcoal to small urban centres, and agricultural products such as gum arabic to collection centres, as well as logging.

Although agro-pastoralism is becoming an important production system and camel pastoralists are attracted to it in two different ways as indicated above, the role of the camel in agricultural operations is rather limited. This can be attributed to cultural and technological factors. Culturally, the use of camel

as draught power is not found among the camel pastoralists of the Sudan, as their culture, until recently, used to be a pure pastoral one and their engagement in subsistence agriculture is a new adaptation. But even if those who have recently adopted themselves to subsistence agriculture decide to make use of the camel in the process, no technology is readily available or encouraged by those involved in rural development planning. Biologically, the fertilizer value of camel manure is not yet known. It has not been used separately in the Sudan as a fertilizer nor for soil conditioning because: (a) camels are not raised in an intensive system and therefore it is difficult to collect their manure; (b) camel manure is in the form of a relatively hard pellet which does not easily dissolve and therefore releases the nutrient very slowly. However, one of the camel's positive contributions in this field is its transporting capabilities, which are well utilized in the new adaptation.

Concluding Remarks

The above discussion attempted to point out the major role played by the camel in the pastoral household in the Sudan. It has shown the limitations of camel pastoralism as a food system and explained why and how camel pastoral groups have to diversify their herds under the changing harsh condition they are living through. The major use of the camel in the pastoral system is more as a store of value than as a food system. This became clearer when entrepreneur households that started an agro-pastoral adaptation became more and more involved in breeding of light camels which have high market values. Camels in the new adaptation did not go beyond its transport capacity due to cultural and technological limitations. As far as food security is concerned, camel pastoralism, like other types of pastoral systems, has to be complemented with other forms of production, as well as trade, agriculture, and other forms of employment.

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