

## INSTITUTIONAL STRUCTURES AND RANGELAND CHALLENGES IN BOTSWANA

U.J. Omphile and A.A Aganga

*Department of Animal Science and Production, Botswana College of Agriculture, Gaborone, Botswana*

### SUMMARY

Botswana is a landlocked country which straddles the Tropic of Capricorn in the centre of the southern Africa plateau. The mean altitude is 1,000 m.a.s.l. and the country's total land area is roughly 584,000 Km<sup>2</sup>. Much of the country is flat with gentle undulations and occasional rock outcrops. The proximity of the country to the subtropical high pressure belt of the southern hemisphere makes it the semi-arid or arid with mean annual rainfall ranging from 650 mm to 250 mm. Almost all the rainfall occurs during the summer months from October to April. The period from May to September is generally dry. Temperatures range from a winter minimum of 5°C to 39°C in Summer. There are roughly eight vegetation types, all closely correlated with climate. Apart from the bush swampland of the Okavango Delta, the vegetation must withstand long dry periods each season. The vegetation must also cope with frequent droughts. Such phenomenon made Botswana largely a range country with arable land comprising only 5% of the land area. Rangelands constitute about 85% of the total land surface. The livestock industry is predominantly beef, operated almost entirely under extensive ranging conditions. Cattle outnumber humans by almost 3:1 ratio. Initially, livestock farming was restricted to hard field in the eastern part of the country, but the development of borehole technology pushed cattle ranching further into areas that previously supported large populations of wildlife and a sparse livestock population such as in the western part of the country which is characterized by a more fragile ecosystem. Coupled with a rather weak livestock policy and unacceptably low off takes, among other problems, this has potential for increasing stock losses during drought periods. The low off takes have resulted in the country not meeting its quota of beef supply to the European Economic Community (EEC), the major consumers of beef from Botswana. Without doubt, problems facing range livestock production in Botswana pose challenges to the range livestock industry and call for the strengthening of some of the institutions dealing with this industry.

*Keywords: Botswana, rangeland, livestock, vegetation*

### INTRODUCTION

Botswana is a semi arid landlocked country in the interior of the southern African plateau. The mean altitude above sea level is approximately 1 000 m and the country's total size is 584 000 Km<sup>2</sup>. It is located between latitudes 17<sup>o</sup> and 27<sup>o</sup> S and longitudes 20<sup>o</sup> and 30<sup>o</sup> E. The country shares borders with Zimbabwe, South Africa, Namibia and Zambia. Unreliable rainfall makes arable agriculture risky and therefore arable land is estimated at less than 5%. The majority (>80%) of the land surface is natural rangelands suitable for extensive grazing of ruminant livestock. Hence, cattle outnumber humans by almost 3:1. With the development of borehole technology, cattle ranching has spread from the eastern hardveld into the western sand veld, exploiting the more fragile rangelands in the west. There are 2.5m cattle, 2.6 goats, 0.7 sheep and several thousands of donkeys and horses used either as draught power or for rounding up cattle.

#### Background to livestock agriculture

Most (>2/3) of the people of Botswana live in rural areas where agriculture, livestock included, is the main economic activity. That is so despite the fact that the agricultural share of the national gross domestic product has declined from 40% in 1966 to about 7% around 1984 and 3% in 1989. However, the agricultural sector, livestock agriculture in particular, remains an important source of food, income, employment and capital for the majority of the population. As much as 260 000 (18%) of the population are informally engaged in agriculture.

The cattle industry is the major contributor to exports, and beef export earnings more than cover the cost of cereal imports. The country exports roughly 19 000 tonnes of beef to the EEC. Livestock agriculture also provides raw materials for the meat processing, tanning, soap and other industries.

### Framework of livestock agriculture

Livestock agriculture falls under two distinct production systems; traditional and commercial. Traditional production number about 85 900 farms which hold about 82%, 97% and 85% of the cattle, goats and sheep, respectively. Production is largely communal from the stand point of grazing, but livestock and water right are in the majority of cases individually owned. The commercial ranches are mainly freehold and in some cases leasehold and cover about 8% of the total land area. These ranches hold 18% of all cattle produced in the country. The ranches tend to specialize in cattle production. For instance, 90% of them held cattle (average herd size > 870) in 1988. There is, however a great disparity in the performance of the traditional and commercial livestock sectors (Table 1).

**Table 1. Average performance of the traditional and commercial livestock sectors in Botswana**

Cattle	Traditional	Commercial
Annual calving rate (%)	50	70
Annual off take (%)	8	17
Annual mortality rate (%)	11	5

Source: Agricultural Statistics Division

These differences reflect different technologies and resource inputs. For instance most of the commercial ranches are either owner managed or managed by trained managers, while management of their traditional counterparts are characterized by absenteeism of owner who have traditional responsibilities of maintaining residence in their villages, or must take up formal employment in order to supplement their farm incomes. In their absence from the farms, managers without formal training in agriculture are employed to run the ranches. These managers generally have very little knowledge of how to manage the farms. As a result, the owners do not allow them decision making powers (Omphile *et al.*, 1995).

The disparity in trained man power in these two sectors of the range livestock industry is further aggravated by, as reported by Samboma (1982), lack of farm infrastructure in the traditional set up. For instance, apart from government provided cattle crushes, most traditional farms lack sound farm infrastructure. Most, if not all commercial farms, on the other hand, have numerous developments such as adequate housing for workers, livestock handling and reliable watering facilities. Because of that, the national accounts indicate that traditional farmers share of agriculture's gross output declined during the drought years from 69% in 1980/81 to 59% in 1985/86. During the same period, commercial farmers share of the gross output increased from 22 to 30% (Agricultural Statistics, 1995).

The decline in the involvement of agriculture in the GDP is due to the competitiveness and costs of livestock keeping in modern day Botswana as well as lack of availability of alternative ways of livelihoods. This trend has delegated agriculture to two broad categories of the population; i.e., those who can afford it and those that do not have alternatives but to farm. Interestingly, cattle ownership has over the years been very unequally distributed and became even more so in the 1980s (Table 2). The number of households who own no cattle is actually higher than these figures show because estimates indicate that 45-59% of the cattle are mafisa (animals kept by one household for another). Range sheep and goats, however are more evenly distributed as three out of four households own some goats and 55% of the households with goats own up to 20, even though the proportion owning more than 50 goats is less than 15%.

**Table 2. Cattle ownership in the traditional farms of Botswana between 1980 and 1988**

	1980	1988
Farm households with no cattle(%)	28	38
Farms with fewer than 40 cattle (%)	51	48
Farms with 40-100 cattle	14	9
Farms with more than 100 cattle	7	5

Source: Agricultural statistics

### Institutional Structures

Livestock agriculture in Botswana is supported by a number of public and private sector institutions which provide a range of services, which include, among others, market outlets, capital, input supplies and a variety of other services to farmers (NDP, 1998). Some of these institutions are discussed below.

### **Government Institutions**

The Ministry of Agriculture, through its Department of Animal Health and Production is responsible for, among others, prevention and control of nationally and economically important animal diseases, research on livestock, extension services to farmers, artificial insemination, meat inspection, the operation of the National Veterinary Laboratory and veterinary research.

Apart from crops research, the Department of Agricultural Research is responsible for livestock research, both on station and on farm. Livestock and range research programmes cover beef, sheep and goats, range and pastures and production systems among others. Other supporting organs of the Ministry of Agriculture include: Agricultural Resources Board, established to implement the Agricultural Resources Conservation Act which is charged with controlling the use of agricultural resources, including rangelands wild fires; Division of Agricultural information which disseminate information on livestock and other activities and the Division of Planning and Statistics which provides statistical and management services on livestock and related activities.

### **Parastatal Institutions**

Several Parastatal (i.e. part governmental and part private) institutions have been put in place to facilitate the smooth running of the livestock industry on sustainable basis. These include the Botswana Meat Commission, Botswana Vaccine Institute, National Development Bank, Livestock Cooperative Societies, Botswana College of Agriculture, Botswana Livestock Development Corporation and others. Only a few of these are discussed below.

#### **Botswana Meat Commission (BMC)**

Established in 1965, the BMC is the main outlet for the country's beef producer and has a statutory monopoly over exports of meat, by-products, processed meat, canned meat and live cattle. The Commission has three abattoirs at Lobatse, Francistown and Maun. The Lobatse plant has a maximum daily capacity of 900 cattle and 400 sheep and goats while the daily capacity of the Francistown abattoir is 450 cattle and 150 small stock. The Maun facility had the list capacity of 100 animals per day. The latter has, however, been closed since 1996, following an outbreak in the Northwest of the cattle lung disease (Contagious Bovine Pleuropneumonia - CBPP) and destruction of all cattle in the district by government. Restocking has already been completed and the abattoir will start functioning as soon as numbers can justify operational expenses. The BMC own a meat marketing organization in Europe (the major consumer of beef from Botswana) with headquarters in London (which also has contracts to market Namibian and Zimbabwean beef to Europe). Major markets (1989/90 figures) are United Kingdom (30%), Germany (16%), Reunion (14%) and Holland (9%). South Africa accounted for 14% of the market. Only 7% of BMC output is consumed locally.

#### **Botswana Vaccine Institute (BVI)**

Established in 1978, the BVI produces vaccines effective against southern African types of foot and mouth virus. It now supplies foot and mouth disease and rinderpest vaccines for export in addition to supplying the local market.

#### **Botswana Livestock Development (BLDC) Corporation and the Cooperative Union**

Both the BLDC and the Cooperative Union were established to facilitate the marketing of livestock, primarily to the BMC. The BLDC (recently insolvent), was formed in 1973 and acted as a public sector buyer of cattle in the remote areas of the country where buying competition is weakest. The corporation also supplied quality breeding cattle to individual farmers. However, the corporation ran into cash flow problems and became insolvent in the mid 1990s.

The Cooperative Union provides livestock marketing services, especially to the small farmer. It supplies about 22% of BMC cattle and 47% of sheep and goats. Its service is of paramount importance to the small farmers who do not have the facilities to get their livestock to the BMC. Cooperative members usually round their animals at designated locations from where the cooperative unions take over and ensure safe delivery of the animals to the abattoir for a small commission.

### **Challenges**

There are two major challenges to the sustainability of both the rangelands and the livestock industry in Botswana. Sustainability of rangelands is more a function of the management of the resource on sustainable basis and the effect on rangelands of competing factors such as wildlife, arable agriculture, urbanization etc (Omphile *et al.*, 1999).

### Resource management

The resource in this case refers to both the range and the livestock. Management of these is pivotal to success of the rangelands at any point in time. Sound management depends, as stated earlier in this paper, not only on the technical know-how of the manager, but also on whether the manager is resident or manages through remote control. A lot of farmers in the traditional farms lack the management expertise to run a ranching enterprise on sustainable basis. Most farms are managed by inadequately trained personnel, who, apart from being technically deficient are often too old or illiterate, thereby posing a problem in understanding modern range and livestock management techniques. They are unable to keep records, a crucial management requirement. Without exception, a manager who cannot keep records can hardly improve production efficiency (Samboma, 1982). He has difficulties in identifying problem areas in his management operations and has nothing on which to base management decisions. Despite very good memory of most traditional managers, improvement could still be argued by proper written records. However, it might be worth noting that management is not only about daily operations, but relies heavily on one's ability to detect and anticipate problems before they occur. Most Botswana livestock owners reside in towns or villages and only visit their farms over the weekends or month end to take stock and pay workers.

### Market security

Although the majority of cattle in Botswana were marketed through the BMC's abattoirs, the BMC share of the market fell from 89% in 1984 to 72% in 1989 in the face of municipal abattoirs and local butcheries. This resulted from a decline in BMC's throughput from 239 300 in 1984 to 112 500 head in 1987/88 (NDP 1998). Most of the fall in beef production was felt in terms of lower exports even though local consumption grew (Table 3). Recently, BMC has gone on an all out effort to attract farmers to sell their animals to its abattoirs.

**Table 3. Production of Botswana beef during the period 1984 - 1989/90**

Output of bonelless beef (000tonnes)	Year						
	1984	1985	1985/86	1986/87	1987/88	1988/89	1989/90
BMC - export	27,1	15,8	19,5	15,0	13,8	17,6	17,6
BMC - Local	1,7	1,1	1,8	2,8	1,2	1,4	1,7
Municipal abattoir	32,7	19,9	25,8	23,0	21,5	26,1	--

Source: Agricultural Statistics

The fall in the number of animals sold to the BMC has meant that the commission has not been able to supply all the beef it is required to sell to the EEC. While it is not anticipated that the under supply of beef to the EEC could lead to loss of the lucrative European markets, such a loss could lead to oversupply to the local markets leading automatically to lower sale prices of animals.

### Suggested solutions and conclusion

It should be noted that solutions to problems relating to tenurial system and absenteeism of the traditional farmers from their operations may not necessarily translate to improved productivity of the ranching enterprise. It has been shown (Samboma, 1982) that there are problems existing in the freehold farms that are very similar to those in the traditional communal areas. For instance, overgrazing and low productivity levels in particular, remain common problems regardless of the type of tenure and farmer. It is of course true that commercial ranches have better production levels than their traditional counterparts as shown in this paper, but they lag far behind commercial ranches in neighbouring South Africa, Zimbabwe and Namibia.

One of the major causes of low productivity of the range beef industry in Botswana is that most Botswana do not regard range livestock farming as commercial enterprise, but rather as a way of life. They invest the proceeds from livestock in more prestigious businesses rather than improving their livestock operations. This has resulted in poor performance of the of the range livestock industry. Without dissuading operators from diversifying from livestock farming, farmers should be urged to consider their operations as businesses that need improvement just like any other and should take pride in them as income generated from farming is just as good as any.

Absentee management (Field, 1977) and ownership (Odel, 1980) has serious limitations to the improvement of livestock and the range resource (Samboma, 1982). This problems stems from some socio-cultural (Molutsi, 1993) and perhaps political factors at play in Botswana's agriculture. For instance, every man/woman is traditional required to retain residence in the village. That means that his

livestock operations out in the rangeland (and far remote from the villages or towns) are paid a visit once in a while to ensure their smooth running. While one must accept that such an arrangement will take a long time and concerted effort to be discarded, management policies for the newly established ranches and open grazing lands should be more strict and require trained and resident managers. Policy makers must also accept that most livestock ranching areas are remote and as such do not attract young and better trained managers with the right management capabilities and attitude. Therefore range livestock owners should be required to improve the salary structure of their workers. That could serve as an incentive. The issue of making food rations part of the workers salary should not only be discouraged but, be stopped as most work would rather buy their own food.

Arrangements as indicated above could address the fall in numbers of animals sold to the BMC which has led the commission to undersupply its quota to the EEC. The issue is important because while it is not anticipated that the under supply of beef to the EEC could lead to loss of the lucrative European markets, such a loss if it happens, could lead to oversupply of the local markets, leading automatically to lower sale prices of animals.

#### REFERENCES

- Agricultural Statistics Division, 1995. Ministry of Agriculture. Gaborone.
- Field D., 1977. Basic ecology for range management in Botswana. Ministry of Agriculture. Gaborone.
- Molutsi, P.P., 1991. Implications of the land tenure system on livestock production in Botswana. p. 141-145. In: G. Tacheba, W. Mahabile, and J. Dailey (eds.). Proc., Livestock production Workshop. Ministry of Agriculture, Gaborone.
- NDP 8. 1988. National Development Plan, 1991-1997. Ministry of Finance and Development Planning, Gaborone.
- Odell M.L., 1980. Botswana's first livestock development project: an experiment in agricultural transformation. Swedish Int. Develop. Authority, Gaborone.
- Omphile U.J.,A.A. Aganga and R.G. Chabo, 1999. Rangeland resource utilization by compatriot wild and domestic herbivores: a general perspective for Botswana. In press.
- Omphile U.J., W.N. Mphiinyane and Jeff Powell, 1995. History of range management in Botswana. International Rangeland Proceedings. Phoenix, Arizona.
- Samboma L.M., 1982. Survey of the freehold ranches of Botswana. Animal Production Division, Ministry of Agriculture. Gaborone.