Chapter 5

Wildlife, Livestock and Food Security in the South East Lowveld of Zimbabwe[1]

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Introduction

The South East Lowveld (SEL) of Zimbabwe provides an interesting example of the conflicts and dilemmas that arise in making policy choices between rural development options involving small-scale agropastoralists and wildlife-based tourism opportunities. The situation is further complicated by the juxtaposition of contrasting land tenure and land-use regimes and impending development of the Great Limpopo Transfrontier Conservation Area (GLTFCA), which may include large parts of the SEL within its purview. The three dominant land tenure/land-use regimes in the SEL are the Department of National Parks and Wildlife Management (DNPWM) land under state jurisdiction, Large Scale Commercial Farm Land until recently under freehold title, and Communal Lands under traditional common property regimes.

In the ongoing debate about wildlife as a potential land use in the region, the key issues depend very much on the perspectives of the various sectors involved. For subsistence farmers (small-scale agropastoralists) in the Communal Lands, livestock form a dominant component of their livelihood strategies. Animal diseases, particularly those associated with wildlife hosts such as foot and mouth disease (FMD) carried by buffalo, and trypanosomiasis, transmitted by tsetse flies but to which many wild ungulates are generally resistant while livestock are often susceptible, are a particular concern to these farmers. In addition, lions, leopards, and cheetahs prey on their livestock, and elephants raid their fields or vegetable gardens. For ranchers in the commercial farming sector, wildlife-based tourism has been an increasingly attractive economic option. However, it has been politically poorly supported, with the result that protecting wildlife resources from poaching has been increasingly problematic. Furthermore, it has been widely perceived to be a threat to food security on the grounds that land used for wildlife should be producing food through cultivation or grazing for livestock. For the state, and for private enterprise involved in tourism, transfrontier conservation areas (TFCAs) are an economically attractive and ecologically sustainable option for the use of drought-prone marginal lands. A high proportion of subsistence farmers also have high expectations for development of their remote areas in the wake of TFCA development but nevertheless feel threatened by the possibility of being sidelined or even dispossessed of their land and resources. Commercial ranchers involved in the wildlife industry see it as a major opportunity. Rural District Councils also welcome the development of TFCAs and associated wildlife tourism and infrastructure in the areas under their jurisdiction.

At the centre of the debate are two critical issues, namely, food security for subsistence farmers and the equitable distribution of benefits from wildlife-based tourism as a land use. This paper then, examines the following questions: 1) how important are livestock to food security in the SEL?, 2) can wildlife production systems meet livelihood needs as effectively as livestock?, and 3) if not, what are the alternatives?

Biophysical and land-use features of the SEL

The SEL covers an area of approximately 50,000km^2 that lies between 300m and 600m above sea level. The 600m contour provides a useful boundary between the low and middle veld and forms a line that coincides roughly with the foothills of the escarpment that rises to form the central watershed of the country. The region extends from the Tuli Circle in the west to the lower Save River in the east. Mean annual rainfall for the SEL is mostly below 400mm and is highly variable both in time and space. The coefficient of variation is greater than 35%. Mean annual temperature is between 25 and 27 degrees Celsius which, when combined with an extended dry season of several months, places great stress on plant growth. The growing season is less than 90 days, making the region unsuitable for dry land cropping.

Communal Lands cover the greatest area (approximately 22,161km^2) in the SEL, followed by commercial farm land (19,570km^2) and state protected areas (5,575km^2) in the form of national parks and safari areas. The highest population density of people, outside of towns and irrigated estates, is found in the Communal Lands (Table 1), where it varies between 10 and 50 people per km^2. Wildlife as a land use occurs in all land tenure categories and covers an area of about 17,500km^2 or 35% of the SEL.

[1]See abstract on p.xxii.

Table 1. Land tenure categories and apportionment of land in the SEL*

Land category	% of area	People/km^2
Communal Land	44.2	11–52
Large-scale commercial farm land		
Irrigation	<0.01	?
Cattle ranches	16	<3
Wildlife + cattle	9	<3
Conservancies	13	<3
Small-scale commercial farm land	0.5	10
Resettlement land (in 2000)	5.8	?
Parks and wildlife estate	11.5	<1
Total	**100**	–

**The total area covered is approximately 50,000km^2 with an overall population in the Communal Lands of approximately 440,000 people at a density of approximately 20/km^2 in 2000.*

Communal Lands – subsistence and vulnerability

Cereal production

The threshold for staple cereals adopted by the Famine Early Warning System (FEWS) in their assessments of food security is 250kg of maize meal/person/year (Anon 1998). In Zimbabwe, the staple cereal is maize, although sorghum and millets are important in arid areas. In most years communal farmers attempt to grow a crop, but the yields are low and uncertain. In the western part of the Beitbridge District, the most vulnerable part of the SEL, the average annual harvest of cereals falls well below the threshold of 250kg per capita (Fig. 1) and during 1980–1995, farmers produced a surplus of grain in only 1 of 15 years (Frost 1999). Small-scale irrigation schemes in the area have mostly fallen into disrepair and no longer provide a safety net for the communities they used to serve (Mead 2001).

Livestock production

Communal farmers in the SEL keep herds of cattle, goats, and some sheep and donkeys. Because the proceeds from the sale of livestock can be used to purchase food, these proceeds can also provide an index of food availability by converting the returns to "maize equivalent income" (Anon 1998). Livestock holdings per household for Machuchuta, Maramani, and Masera Communal Lands during the 1998–1999 season varied between 10 and 18 tropical livestock units (TLUs), and estimates of livestock sales and maize equivalent income for the three Communal Lands in question varied from 290kg per person in Maramani to 1,433kg per person in Machuchuta (Anon 1999). While these figures clearly illustrate the importance of livestock to food security, annual fluctuations in livestock populations and productivity also occur in response to droughts, disease, and civil disturbance. The distribution of livestock holdings is also highly skewed in most Communal Lands with Gini values of about 0.65 instead of 1.0 – the value reflecting equitable distribution amongst households (Cumming and Bond 1991). Long-term livestock trend data were not available for the Communal Lands in western Beitbridge District, but were available for an essentially similar area adjacent to the Gonarezhou National Park, the Matibi II Communal Land in the Chiredzi District. These data (Fig. 2) in conjunction with those for the human population provide a typical example of the magnitude of change that can

Fig. 1. Mean cereal production in three Communal Lands in the SEL of Zimbabwe over 15 seasons between 1980 and 1995 (data from Frost 1999).

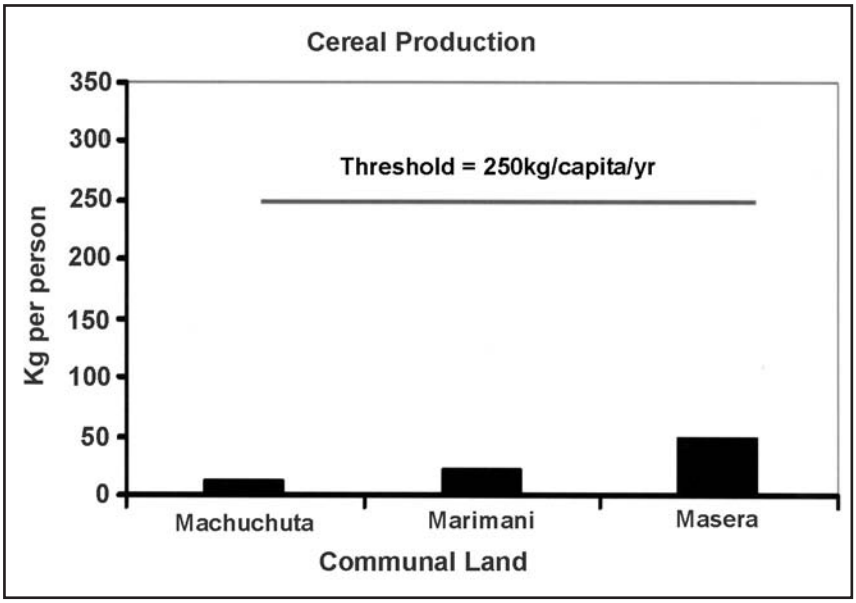
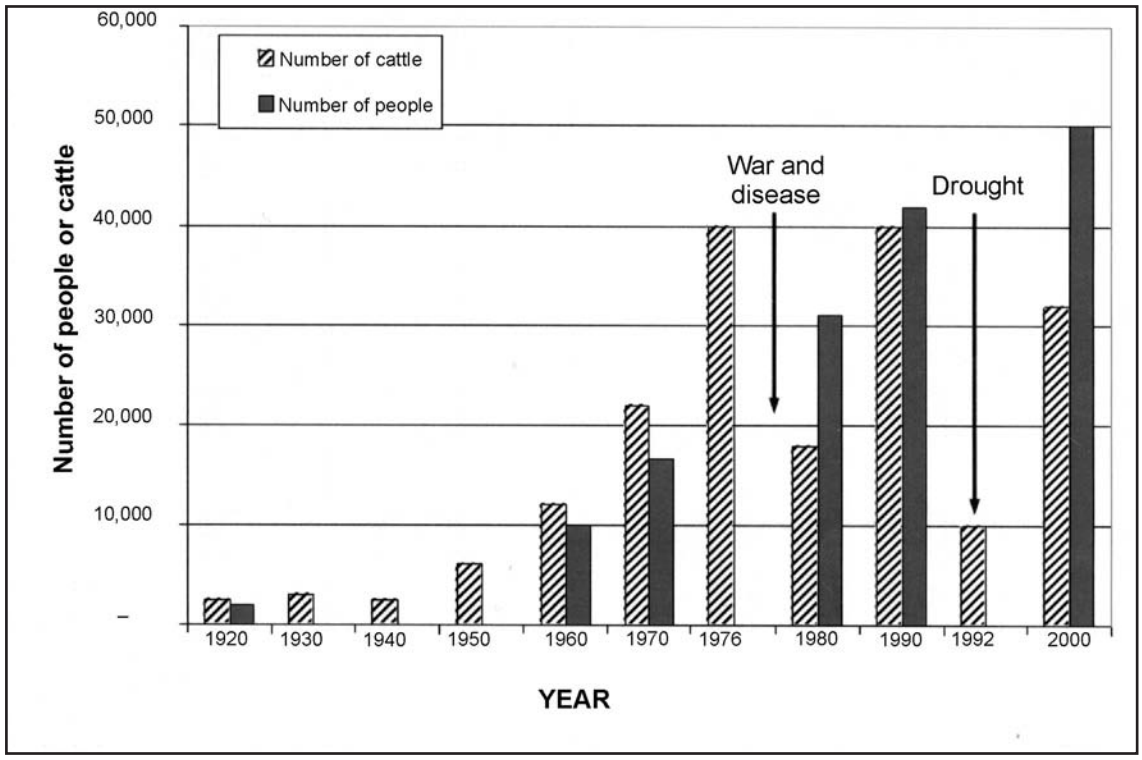


Fig. 2. Growth of human and cattle populations in Matibi II Communal Land between 1920 and 2000. Cattle numbers declined markedly in the late 1970s and during the 1991–1992 drought.



occur in livestock numbers in the Communal Lands of the SEL. A major crash in cattle numbers occurred in the late 1970s and was associated with Zimbabwe's war of independence and an associated breakdown in veterinary services and increased incidence of disease (Norval 1985). The second major crash followed the 1991–1992 drought (Fig. 2).

Population growth and farm size

The human population of Matibi II Communal Land grew more than tenfold during 1920–2000, with an accompanying decline in land available per household from greater than 600ha/household in 1920 to less than 50ha/household in 2000. The area of land required to maintain a household with minimum external inputs in a semi-arid area such as the SEL is at least 400ha. This estimate is based on the need for a household to have access to 20ha of arable land, with 5ha being planted each year on a 4-year rotation, and to 400ha of grazing land to maintain a herd of 25 cattle and 35 goats. The 400ha threshold was however unmet by 1940 when the land available had declined to 300ha per household. The capacity of the resource base to support its population has thus been exceeded in the Matibi II Communal Land for more than 60 years. This of course begs the question of how people have been able to survive under these conditions, and the answer lies in the support received from off-farm remittances from wage labour in the cities, commercial farms, and estates. Food aid programmes have also supplemented the livelihoods of resource-poor households in the SEL over the past 20 years (Government of Zimbabwe 1993).

Returns from wildlife

The establishment of the Communal Area Management Programme For Indigenous Resources (CAMPFIRE) in the late 1980s promised to boost household incomes through the commercial use of wildlife resources in communal lands still rich in wildlife resources. Substantial returns have been realised from safari hunting leases and the sale of trophy animals in Communal Land areas in the SEL. However, the key questions are how do these returns compare with those from livestock, and what level of returns from wildlife would be required to move households above the food security threshold level of 250kg/person/year?

The CAMPFIRE revenues for the Beitbridge District provide an example of the level of returns that were realised during the 1990s and until the collapse of the tourism industry in Zimbabwe after 2000 (Fig. 3). An annual return of US $30,000 to the district from wildlife was sufficient to purchase approximately 100,000kg of maize meal or enough to feed 400 people for one year. To place this figure in the context of food security for the Beitbridge District, the human population of Maramani Communal Land alone was 4,200 while that for all of the Communal Lands in the district was 72,059. Clearly, CAMPFIRE revenues make a negligible contribution to food security in the context of the SEL.

Commercial ranches – returns from wildlife

Commercial wildlife ranches provide a basis for judging the potential returns from wildlife-based land use and thus the likely contribution to the rural economy and food security in the SEL. Studies of the returns from wildlife ranching in southeastern Zimbabwe (Bond 1993, Child 1988, du Toit 1992, Jansen *et al*. 1992, Kreuter and Workman 1997, Price Waterhouse 1994) and spreadsheet analyses of the influence of farm size and rainfall on gross returns from safari hunting (Cumming, unpublished data) indicate that gross returns from wildlife-based enterprises are likely to be in the region of US $6–8 per ha. Note that these figures are for areas not involving high-valued tourism ventures. Net revenues (i.e., returns after deducting fixed costs) are approximately 50% of gross revenues resulting in a net return of US $3–4 per ha.

Converting the above levels of financial return into maize equivalents results in a return of about 10kg of maize meal per ha or enough to support three to four people/km^2/year. This in turn is equivalent to supporting one household of six people on 2km^2 or 200ha. Current densities in the Communal Lands are greater than 10 people per km^2, which translates into less than 50ha per household. Clearly, wildlife production does not provide a viable food security option, and returns would need to be four to five times higher for it to be considered as such. These financial considerations do not take into account the enormous social and cultural implications of attempting to switch from an agropastoral to a wildlife-based economy. (As one District Council official remarked in a discussion of this issue, "The problem is that cattle are *mine* but wildlife is *ours*.")

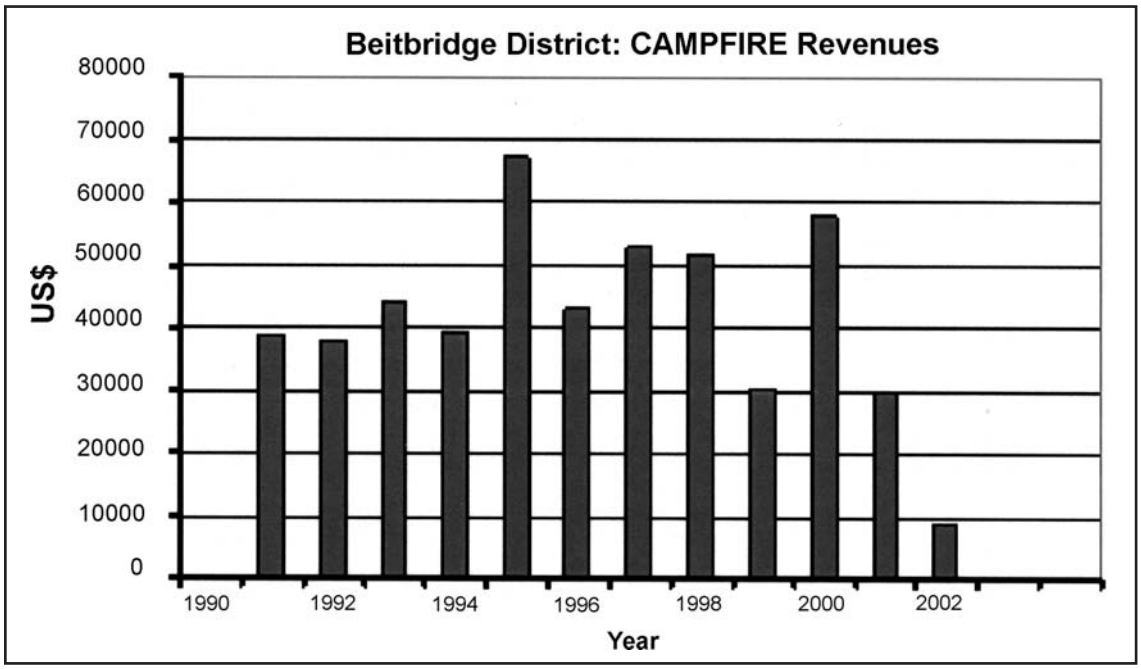
An additional constraint is that once human population densities exceed about 15 people per km^2, wildlife populations, and particularly higher valued species such as elephant and buffalo, decline or disappear (Bond 1999) with a consequent drop in revenue earned from wildlife.

Discussion

The population to resource ratio in the SEL of Zimbabwe is such that the natural resource base is not able to support the present population either through agropastoralism, wildlife production, or both. The human population in the SEL, particularly in the Communal Lands, is able to subsist through subsidies delivered to the region in the form of returns from off-farm labour supplemented by direct food aid in most years since the early 1980s. An essentially similar conclusion was reached by Campbell *et al*. (2002) following a long-term intensive study of livelihoods and production systems in the Chivi Communal Land, which is also in southeastern Zimbabwe but above the 600m contour. The population to resources ratio and the associated food security problem is also unlikely to be solved by small, incremental improvements in crop and livestock production in the Communal Lands of the region.

The bleak conclusion that existing land-use practice and policy is unlikely to resolve the problem raises the issue of what might mitigate the current problems of endemic food and environmental insecurity. In these circumstances, land tenure reform is frequently seen as a primary requirement. The current land reform programme initiated in Zimbabwe in 2000, ostensibly to decongest the Communal Lands, has had little impact on livelihoods and, if anything, has exacerbated

Fig. 3. Revenues (US$) generated by CAMPFIRE for the Beitbridge District from 1990 to 2002 (data from WWF-SARPO database).



the food security problem. Tourism has all but collapsed, production from irrigated estates has been disrupted, resettled farmers have lacked the inputs and resources to use newly settled land productively, and outbreaks of diseases such as FMD and anthrax have affected both livestock and wildlife production. Land tenure reform since 2000 has taken the form of transferring freehold land to state and leasehold land and, as Murombedzi and Gomera (2004) argue, this route is unlikely to attract investment and result in the productive use of the land in the long term.

What land-use strategies might then be adopted to mitigate the present dilemma? I suggest that the following four strategic approaches to land use and development would be appropriate.

1. *Place a premium on, and invest in, higher valued land uses and diversification*. There are many areas of irrigable soil in the SEL that merit development and others where irrigation schemes have collapsed or are underutilized. Developing potential intensive production areas in concert with appropriate livestock development would go a long way towards alleviating food shortages and unemployment. Associated investments in infrastructure to facilitate marketing of goods and services would be necessary.
2. *Decouple wealth creation from net above-ground primary production*. Because primary production in the SEL is so greatly limited by rainfall, the more wealth creation can be decoupled from a direct reliance of primary and secondary production, the less susceptible it will be to annual seasonal fluctuations in rainfall. One means of achieving this end is to develop high-valued tourism ventures in which the value is derived from services instead of from crop and meat production.
3. *Match land use and ecological process scales*. In arid areas, livestock and wildlife production systems generally require large areas over which to exploit temporal and spatial variations in the availability of key resources. Fragmentation of large landscapes by fencing and inappropriate land tenure systems and systems of resource access rights militate against adaptive strategies that may be more productive and sustainable in arid areas. The development of large-scale wildlife conservancies involving the effective amalgamation of former cattle ranches into large-scale wildlife tourism areas is a case in point (e.g., du Toit 1992).
4. *Develop legal and policy frameworks that enable local-level innovation and adaptability in resource access rights and management strategies*. Current centralized prescriptions over land use, tenure, and resource access rights effectively stifle innovation and the development of adaptive co-management regimes at larger scales and across land tenure categories. It is suggested that releasing the innovative capacities of farmers, resource managers, and communities may go a long way towards solving the food and environmental security problems of the SEL.

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