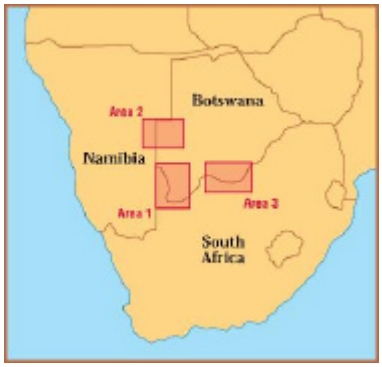
Environment and the Sustainability of Natural Resource Practices

Key points

- **Extensive, flexible land uses are well adapted to dryland environments**
- **They embody strategies in tune with environmental variability**
- **Sedentary practices are prone to the impacts of drought. Greater risks are incurred, including environmental degradation**
- **The current trend towards more sedentary livestock production on smaller land units is unsustainable**



Research areas:

1 Arid southwest:

a) Mier, South Africa

b) SW Kgalagadi, Botswana

2. Semiarid northwest:

a) Ghanzi Dist, Botswana

b) Omaheke, Namibia

3. Dry sub-humid southeast:

a) NW Province South Africa

b) Barolongs, Botswana

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PANRUSA Briefing Notes

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This briefing contrasts the environmental impacts of traditional, flexible, dryland land use systems with more rigid sedentary activities. For a variety of reasons, including growing populations and the quest to develop and commercialise, the latter dominate dryland use in Botswana, Namibia and South Africa. Such systems have already had profound environmental impacts and are not likely to be sustainable unless they incorporate mechanisms that allow natural resource use flexibility during times of stress, or unless practitioners have alternative livelihood support systems for these times.

The drought-prone dryland region of the southern African interior, is characterised by a very seasonal climate (rain in the summer, dry in the winter) and the absence of perennial surface water. The driest southwest (incorporating research area 1) has the closest appearance to a desert, with relatively sparse vegetation, areas of clearly defined sand dunes; Northern areas (incorporating research area 2) are relatively well vegetated; and the south east (research area 3) has a more rolling terrain, cutting into areas where soils are better and suitable for cultivation.

Mobile low intensity activities

Traditional land uses in the Kalahari have been based on two extensive, low density, mobile activities. Hunting and gathering was based on using veld products and wildlife, with groups 'following the rain' and the availability of natural resources this generated. Livestock have entered the Kalahari for at least 2000 years, but only during wet years when owners would move herds temporarily from their usual pastures in neighbouring wetter areas, to exploit the grasses and pools (pans) of standing water brought by good rains. In both cases, such livelihoods exploited resources when available and did not put pressure on them at times of environmental stress. The environment was able to recover, even after severe droughts.

Sedentary resource use systems

Sedentary practices essentially began during the colonial period; they have intensified dramatically since independence. They are mainly livestock based with some arable activity in the southeast.

Farms and ranches

Farms were established in the late 19th century, along the Molopo valley, and on the Ghanzi ridge, where shallow aquifers allowed sedentary cattle rearing to be attempted. During the 1930s boreholes were sunk in the sandveld to provide relief for traditional Kalahari groups during a time of severe drought. They were numerous by the 1950s, but with a designated 10 km spacing. Many became cattle posts, used seasonally or even permanently by cattle herders in more densely populated regions. Since the 1970s in Botswana borehole ranches expanded into the Kalahari, (see BN 10A), linked closely to the commercialisation of the cattle industry. Farms and communal lands in Namibia and South Africa are increasingly being fenced too, as individuals and consortiums claim land for their exclusive use. In almost all cases borehole-centred livestock production, both commercial and subsistence, is practised.

Typical Kalahari borehole

Environmental impacts: livestock

Fenced borehole systems

1. Provide year-round water for livestock
2. Limit the movement of livestock, allowing owners to control and monitor stock
3. Limit wildlife movements and migration
4. Place year round pressure on vegetation
5. Control the spread of disease amongst livestock

Points 2 and 5 allow government livestock requirements to be better met, and thereby meat to be sold commercially, including internationally. Points 1,3,4 can readily generate negative environmental impacts. As long ago as the 1950s it was noted that the farms of the Molopo/Nossop area were becoming severely degraded. Some adjoining units merged in order to provide a sufficient land area for production, with small stock becoming preferred to cattle. Others ceased to function as farms.

Year-round pressure on grazing allowed by boreholes leads to ecosystem degradation, notably the loss of palatable grasses and increases in annuals and bushes. Some farmers have divided their land into paddocks and practice grazing rotation to ease pressures. But on many farms stocking levels are extremely high (>500) in an area of 8km radius. Water tables are falling and turning saline: some farmers have sunk extra boreholes that add to, rather than relieve the problem. During droughts, fences limit livestock movement in the search for grazing, so fodder has to be provided, animals moved, sold, or left to die.

Farmer responses

Livestock owners are adept at coping with these difficulties (see BN5A&B), but it is hard to view Kalahari farms as a great commercial success. Farmers are taking actions such as:

- Alternative livelihoods- e.g. jobs in towns to supplement incomes
- Diversifying practices: having mixed stock, not just cattle or sheep, so that different vegetation is exploited
- Reducing stocking levels
- Moving to wildlife farming/hunting, as these are better adapted environmentally, and better able to survive drought

Environmental impacts: ***arable***

In the NW most arable activities appear to have relatively limited environmental impacts except in the form of nutrient depletion, which commercial farmers deal with by applying fertilisers and crop rotation. Small farmers are less able to do either. In the Barolongs significant areas have gone out of production for political and commercial reason (see BN4C), but droughts further compound problems.

Future sustainability

Regional climates are predicted to change during the 21st century under global warming effects. Predictions vary but interestingly many predict a drier but less drought-prone interior southern Africa. While the latter may offer a marked benefit, the former will further compromise the sustainability of farm-based livestock activities.

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