

Holistic Resource Management

To stop land degradation in southern Africa, a range management system is being applied which imitates elements of traditional herding. Although presently used mainly on large-scale commercial farms, Holistic Resource Management offers promise also for managing communal grazing areas where herding skills still exist.

Hans-Peter Lühl

Vast areas of Africa which were used for centuries by nomadic herders are being degraded. For example, the pastures of Namibia supported 3.7 million cattle and 5.7 million small ruminants 40 years ago but now support only 1.8 million cattle and 4.3 million small ruminants. The area has become drier, not because of less rainfall but because grazing led to increased runoff. Grazing by mainly cattle and sheep also led to shrub encroachment.

Can this land degradation be stopped? A growing number of commercial ranches in Mexico, USA, Zimbabwe, Namibia and South Africa which apply Holistic Resource Management (HRM) methods suggest that it can be.

HRM methods were first advocated by Allan Savory in the early 1960s. He states that natural resources can be regenerated only if all interacting ecological, economic and social factors are taken into account in

the management process (Savory 1988). HRM starts with a process of discussion and negotiation during which the resource users set a common goal made up of three interacting parts:

- desired quality of life
- production to attain the desired quality of life
- vision of the landscape and ecosystem that will sustain the necessary production.

Missing keys

HRM methods are based on a recognition of "missing keys":

- the difference between "brittle" and "non-brittle" environments. "Brittle" means that, if these pastures are closed to grazing, the diversity and stability of the plant cover does not increase. Instead, the plant community simplifies and becomes unstable. Long resting periods lead to degradation. Many drylands are "brittle".
- the importance of animal impact. Trampling, defecating, urinating, rubbing and selective grazing by animals has a decisive and - if properly managed - positive impact on the viability of plant communities. Short intensive grazing and "hoof ploughing" can stimulate plant growth.
- overgrazing is not so much a function of animal numbers but of *time* the pasture is exposed to grazing. Where wildlife could migrate freely and in traditional herding systems, a pasture was intensively used for a short period and then left to rest. Increased sedentarisation of herders has led to more permanent gra-

zing in one location, with little or no time for the plants to rest, resulting in localised desertification.

Applying HRM on our farm

We have applied these keys on our farm "Garib", which supports about 200 people on 20,000 ha. We produce beef and antelope meat with very low external inputs of fodder, parasiticides etc. Long-term average annual rainfall is 270 mm, but averaged only 176 mm during the 1980s. We keep 1600-2300 cattle and 600-800 large antelopes (oryx, kudu, springbok).

The farm is presently subdivided into 230 paddocks arranged as "cells" around 23 watering points. The process of subdividing the farm started 40 years ago. We try to subdivide so that the vegetation in a particular paddock is uniform.

Pasture use plan

In the late wet season, we draw up a pasture use plan based on estimates of fodder yield per paddock, measured in cattle-days per hectare. The plan includes a safety margin of about 60 days and takes account of special requirements for lactating cows, breeding period etc. The plan is adapted, when necessary, to condition of the vegetation, which we observe closely.

During the dry season, the cattle are divided into 14 herds, each grazing 16 paddocks in rotation. A paddock is grazed for about 6 days and rested for 90 days. In the wet season, the cattle are divided into 8 herds grazing 28 paddocks each. A paddock is grazed for only 2-3 days and rested for 54-80 days.

The speed of pasture rotation is adjusted to the rate of vegetation growth, which we monitor with small control plots. We use photographs taken at predetermined points before and after the growing period to visualise and document pasture trends.

As we operate in a dry area with uncertain rainfall, we have to adjust the number of animals to the farm's carrying capacity, primarily by selling animals if we have too many and buying animals if we have too few to fully exploit our carrying capacity.

"Overstocked" but thriving

The officially recommended stocking rate for Garib is 22 kg cattle liveweight per hectare. Although rainfall was below average in the 1980s, we stock at a rate of 35 kg/ha or 80% more than recommended - not



Photo: Hans-Peter Lühl

Cows with their calves on the Garib farm in Namibia, about one month after the rains have ceased and three months before weaning. This is part of the photo records mentioned in the text.

Can it beat desertification?



counting the wildlife. The average conception rate of the cattle is 83%, well above average for the district.

The trends we observe in vegetation give hope that, within a few years, Garib will be almost completely covered with perennial grasses. We can then increase the stocking rate further.

Although our paddocks are already small by commercial Namibian standards, further subdivision would allow us to keep more animals. In a trial comparing 2 cells with 10 paddocks each, we found that, when we decreased the paddock size from 225 ha to 34 ha, we could almost double the stocking rate: from 38 to 64 kg/ha on average over 7 years.

Imitating traditional herders

HRM borrows heavily from traditional pastoral practices. However, we may have to be more formal in our approach than experienced herders, whose day-to-day activities make them very familiar with their environment. Our fences partially replace herders, and are intended more to subdivide the grazing time than the grazing area. However, fencing requires capital investment, as does the installation of waterpoints. HRM also demands a high degree of personal discipline.

Our biggest problem is adapting management to fluctuating rainfall, such as when we have to dispose of 40% of the herd because the rains failed. If drought is widespread, prices may be so low that selling animals means severe economic loss. In some years, we can lease additional nearby pasture on a short-term basis. During the current drought in southern Africa, we were able to arrange to use an additional property about 200 km from Garib and trekked our cattle to it. Our drought management strategy thus includes a strong element of geographical diversification, which also imitates traditional pastoral practices.

Application to communal pasture

Traditional grazing areas could be managed according to HRM principles, but we have thus far had limited success in communal areas of Namibia. During the colonial period, many traditional skills of the indigenous pastoralists were lost, and responsible land management was more often discouraged than encouraged.

Other parts of Africa where local people still master the "art of herding" (Müller 1992) may be more fortunate. Still today, some pastoral groups continue to apply sound range management principles: eg using a certain pasture heavily for only a short time and not entering new pasture if signs of trampling or high amounts of cattle faeces indicate recent intensive usage (Niamir 1990). These skills and methods could be incorporated into an HRM land-use system.

However, HRM methods cannot work if pasture is "free for all". If some pastoralists rest a grazing area so that it can recover, others would use it. It is therefore necessary that a clearly delineated group of people controls management of a particular area to which they have secure communal land rights. Also "goal ownership" is vitally important. The group must agree on a common, realistic vision of a landscape suitable to support the necessary production for their desired quality of life.

The area may have to be fenced to ensure proper landuse, but strict and disciplined herding may suffice. The major obstacle is most likely not in the landscape vision and understanding of ecology which is central to HRM, but creating an efficient management structure which can react quickly and flexibly to the observed changes in pasture vegetation.

References

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Rethinking range ecology

"Management and Sustainable Use of Communal Rangelands in Africa" is a joint research programme of the Commonwealth Institute, the Overseas Development Institute (ODI) and the International Institute for Environment and Development (IIED) in London. Floy Behnke (ODI) and Ian Scoones (IIED) have produced a clear, concise summary of the presentations and discussions at the Technical Meeting on Savanna Development and Pasture Production, held as part of this programme.

The 39-page paper, entitled *Rethinking range ecology: implications for rangeland management in Africa*, argues that stability of arid range vegetation cannot be achieved since, in these "non-equilibrium" natural pastures, vegetation growth is influenced much more by variation in rainfall than by grazing pressure. As arid areas are characterised by large fluctuations in rainfall, fodder availability varies greatly between years and the number of animals which can be supported in a given area varies accordingly.

Therefore, calculations of a fixed carrying capacity per unit area are of little use, and range resources are more efficiently used by mobile rather than settled forms of livestock-keeping. Arid rangeland can be used most productively yet sustainably by following "opportunistic" strategies, as in traditional pastoralism, rather than the "conservative" strategies of modern ranching.

This paper provides very stimulating reading, and is a must for anyone with an influence on rangeland policies. Further documents coming out of the programme include a report on the 1992 workshop in Zimbabwe "New Directions in African Range Management Policy" (30 pp) and case studies on managing communal rangeland in Botswana and Zimbabwe.

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