

The 13th Namibian Rangeland Forum

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Background

The Namibian Rangeland Forum (NRF) is an unconstituted group, including farmers, extension workers and scientists, with a common interest in the ecologically and economically successful management of Namibia's rangelands. It has met once every year since its inception in 1997. The 13th meeting of the NRF took place on 27-29 October 2009 at the Neudamm campus of the University of Namibia's Faculty of Agriculture and Natural Resources, east of Windhoek. The forum attracted 69 participants and was hosted by the Biodiversity Monitoring Transect Analysis in Africa (BIOTA) programme under the theme "The role of biodiversity in rangeland management and policy". Abstracts and presentations of the forum can be downloaded from the BIOTA website <http://www.biota-africa.org>

Presentations

The keynote address was given by Richard Fynn, from Botswana, on the influence of the scale of grazing on rangeland quality, carrying capacity and herbivore population performance. Richard provided evidence that seasonal migrations of large herbivores and pastoralists often occurred along rainfall and landscape gradients. They also used to move opportunistically over long distances in response to localised rainfall and fires. These seasonal migrations and irregular movements allowed the animals to optimise their nutrition through more and longer availability of green leaves, while subsequently providing sufficient rest for recovery of the repeatedly grazed grasses. The subdivision of land by fencing has greatly restricted the scale at which systems can now operate, thus reducing the carrying capacity and productivity of rangelands, while often leading to land degradation. Richard proposed the re-introduction of transhumance pastoral migrations between wet and dry season grazing areas where unfenced land still exists, such as in north-west Botswana. In situations where land subdivision is irreversible, he pro-

posed cooperation between neighbouring farmers to jointly manage their herds over larger areas, such as the practice of agistment applied by some Australian farmers (McAllister *et al.* 2006).

Andreas Petersen presented results from studies that he (Petersen 2007) and colleagues conducted along the BIOTA transect. Their findings included that: greater heterogeneity of soils supported a greater diversity of plant species; termites created nutrient hotspots at their mounds; and sandy dune soils captured and stored more rainwater than loamy interdune soils. Frank Bockmühl presented interesting evidence that clearing of encroached bushes allowed heavy rain to replenish groundwater and re-activate springs that had dried up decades ago when bushes encroached.

Dave Joubert presented his ongoing research into the dynamics of *Acacia mellifera*, and its implications for the management of bush encroachment. He is testing ideas in his state and transition model for the Highland Savanna (Joubert *et al.* 2008) on the role of browsers, fires and competition with grasses on the establishment of *A. mellifera* seedlings. The presentation by Justus Kauatjirue was on a pilot restoration project that used chopped branches from *A. mellifera* as filters in a gullies and rills of a key fertile valley of the Highland Savanna (Shamathe *et al.* 2008). The perennial grasses are now taking over the filtering function as the branches are rotting, more than two years later. Dagmar Honsbein presented on the influence of thermo-chemical conversion on rangeland condition. Various designs of kilns allow the conversion of encroached bush wood to products more valuable than the more commonly produced charcoal, including wood gas that can provide energy and wood liquids that can be processed into high value chemicals for use as preservatives, fertilisers, pharmaceutical products and bonding agents.

Stephanie Domptail presented results from a part of her study of commercial farms in southern Namibia on the role of bio- and landscape diversity in farming strategies (Domptail et al. in press). Thomas Falk demonstrated a computer farming simulation game that is used for research and as a training tool. It was developed for eastern Namibia based on an eco-hydrological model (Tietjen et al. in press) linked to an agent-based economic model that responds to management decisions by land users. Bertus Kruger presented some of his work with resettled farmers, three of whom signed a memorandum of understanding with each other. The intention is to combine their herds for cooperative rangeland management of a former single commercial farm that had been subdivided for resettlement into units too small for the provision of viable rest.

Lahja Tjilumbu presented results from her research on the influence of patch burning in the Thornbush Savanna. A considerable number of smaller plants died, even in the unburnt controls, probably due to the exceptionally long dry season in which the fires were applied. For most perennial grass species the mortality was higher in the burnt patches. The use of fire after such a premature end to the rainy season may be inappropriate for most rangeland management objectives. Previous patch burning created nutrient hotspots as determined by radish bioassay of soil samples (Zimmermann *et al.* 2008). Ibo Zimmermann presented results from measurements on three farms in eastern Namibia where short-duration grazing is being practiced. There was a higher density of grasses, and occasional higher soil moisture, outside of exclosures. Some management applications of strategic trampling applied by one of the farmers (Zimmermann and Smit 2008) were also presented. Sagaria Muheua used a problem tree to differentiate between symptoms and causes of helminth infestations in sheep. Farmers who successfully raise sheep without the need for toxic anthelmintics tend to apply management closer to the root causes (Zimmermann et al., in press).

Jeanette Swartbooi and Roberth Mukuya, both BIOTA Para-ecologists (Araya *et al.* 2009), gave a presentation on the making of a film about their activities called "Bridging the gap", which was then screened. Leon Lubbe provided background to the develop-

ment of a National Rangeland Policy and Strategy (NRMPS) for Namibia. The latest draft of the document was recently presented to top managers in the Ministry of Agriculture who requested an overhaul, while its presentation at the forum provided the opportunity for further suggestions.

Riaan Dames presented on his controlled fodder flow grazing management strategy and grass-fed beef, which has allowed communal and commercial farmers in South Africa to increase the carrying capacity of their rangeland and fetch higher prices for their cattle. By allowing animals to graze where they wish over the other half of the farm, the animals select the most nutritious plants and keep them in a more nutritious, leafy state. By resting half of a farm for a full year, the perennial grasses receive sufficient rest to regain vigour and grow very fast after they are next grazed, when their increased vigour can support more animals, which will in any case be needed to keep the grass in a more nutritious state. At the start of the rainy season, when allowed to graze on the half of the farm that received rest for a year, the animals will trample down the tall, less nutritious grass, while selecting fresh nutritious leaves that will continue to re-grow quickly, ensuring that the animals too grow fast and produce high quality meat without the need for energy supplements that lower meat quality.

Sebastian Prediger presented results from economic experiments that aim to mimic typical common-pool resource management dilemmas faced by communal farmers. There were substantial differences between farmers in their propensity to cooperate. Those from Namaland in Namibia appeared to play the simulation game more cooperatively than those from Namaqualand in South Africa, presumably due to the greater disruption of communal lifestyle by colonial forces in Namaqualand, where the inhabitants rarely even speak their traditional language of Nama. Stephanie Domptail presented on a bio-economic model that was used to analyse likely responses by sheep farmers in southern Namibia to different ways of applying a land tax. It suggested that the currently applied land tax would not lead to improvements in farming, whereas a system that rewards farmers for good condition of their rangeland would act as an incentive for farmers to improve the management of their rangeland, while providing the same income to



Figure 1: NRF participants review research results at a site burnt one year previously.

the state (Domptail in prep.). The presentation by Angelique Groenewaldt discussed the practicalities of implementing the NRMPS from a legal perspective. None of the existing laws provide direct guidelines on how to deal with the degradation of rangeland. Problems with law enforcement suggest that laws which provide incentives may work more effectively than laws that apply prescriptive prohibitions.

Taimi Kapalanga did not participate in the forum, so her presentation was presented on her behalf. It summarised her desk-top study that reviewed methods of monitoring and assessing land degradation at different scales. The presentation of Hugh Pringle was also presented on his behalf. It highlighted the view of a hierarchical, catchment-based understanding of rangelands. The dynamic edges between veld types provide a better early warning of rangeland changes than the more conventional monitoring of calm sites (Pringle et al. 2006). Incised catchments experience downward spiralling of rain use efficiency and greater

drought vulnerability. This is a pressing, overlooked global issue that is driving bush encroachment as water-ponding surfaces no longer pond effectively.

Workshopping

Axel Rothauge presented principles that had been drawn up by the committee which drafted the NRMPS. He then asked for additional suggestions for repairing the condition and productivity of Namibian rangelands, from which a list was drawn up. Louisa Mupetami facilitated the formation of four groups to workshop issues of policy, institutional structures, ecology and value addition. The recommendations were summarised and submitted to the committee for consideration to be incorporated into the re-drafted NRMPS.

Field visits

Dave Joubert led a field visit on Neudamm to some of his research sites (Figure 1) where he is studying the dynamics of *A. mellifera*. When viewing the



Figure 2: NRF participants inspect a gully system treated with branches of *Acacia mellifera*.

site burnt one week earlier, there was discussion about the need for grazing soon after a fire, to keep the regrowth in a nutritious state. This is contrary to conventional belief that grasses require rest after burning. Provided that the grass had received a long rest during the wet season before the fire, its root reserves should be sufficient to allow it to be repeatedly grazed during the season after the fire. It may only require rest again during the following growing season.

Ibo Zimmermann led a field visit to the Auas-Oanob Conservancy where a pilot restoration site had been treated with branch filters (Figures 2) as described in the presentation by Justus Kauatjirue. When viewing the treated gully system, there was discussion about alternative management options. Animal impact may help to reduce soil capping, and smooth out the steep sides of gullies and increase grass density. A higher density of perennial grasses was evident outside an enclosure erected more than two years earlier. Excessive game animals had been viewed as

contributing to the cause of rangeland degradation in the conservancy because they tended to follow the cattle rotations and feed on grass that should have been rested. However, views were expressed that if longer rest was built into the cattle rotation, then game would only graze the areas recently grazed by cattle, because the grass would grow too tall in areas that had received long rest.

References

- Araya YN, Schmiedel U and Von Witt C.2009. Linking “citizen scientists” to professionals in ecological research - examples from Namibia and South Africa. *Conservation Evidence* 6:11-17.
- Domptail SE, Nuppenau EA and Popp A (in press) Land tax: towards a multifunctional institutional tool for land reform and rangeland conservation. *International Journal for Environmental Policy and Decision Making*.

- Domptail SE (in prep.).
Empirical ecological-economic analysis of farming systems, farmers' ecological knowledge and strategies. In: Towards rangeland conservation strategies. Case study and bio-economic modelling of farms in southern Namibia. Ph.D. Thesis, University of Giessen.
- Joubert DF, Rothauge A and Smit GN 2008.
A conceptual model of vegetation dynamics in the semiarid Highland Savanna of Namibia, with particular reference to bush thickening by *Acacia mellifera*. *Journal of Arid Environments* 72: 2201-2210.
- McAllister RRJ, Gordon IJ, Janssen MA and Abel M 2006.
Pastoralists' responses to variation in rangeland resources in time and space. *Ecological Applications* 16 572-583.
- Petersen A.2007.
Pedodiversity of southern African drylands. Ph.D. Thesis, University of Hamburg.
- Pringle HJR, Watson IW and Tinley KL 2006.
Landscape improvement, or ongoing degradation: Reconciling apparent contradictions from the arid rangelands of Western Australia. *Landscape Ecology* 21:1267-1279.
- Shamathe K, Pringle HJR and Zimmermann I 2008.
Restoring rain use efficiency to an incised upland valley system in Namibia using filters and Ecosystem Management Understanding (EMU) principles. p.783. In: Organizing committee of XXIth International Grassland Congress / VIIIth International Rangeland Congress (Editors). *Multifunctional grasslands in a changing world. Volume 1.* Guangdong People's Publishing House, Guangzhou, China.
- Tietjen B, Jeltsch F, Zehe E, Classen N, Groengroeft A, Schiffers K, Oldeland J (in press).
Effects of climate change on the coupled dynamics of water and vegetation in drylands. *Ecohydrology*. DOI 10.1002/eco.70.
- Zimmermann I and Smit GN 2008.
Case study of adaptive rangeland management by an innovative Kalahari farmer. *Agricola* 8:7-16.
- Zimmermann I, Tjilumbu L and Diekmann G 2008.
Nutrient hotspots from patch burning in a Namibian rangeland. p.405. In: Organizing committee of XXIth International Grassland Congress / VIIIth International Rangeland Congress (Editors). *Multifunctional grasslands in a changing world. Volume 1.* Guangdong People's Publishing House, Guangzhou, China. 📖