

Background & Aim of the Study

Local knowledge is a key to understanding pastoralists’ strategies of sustainable natural resource management^b. It is particularly interesting to investigate how local knowledge is produced and used in a highly unpredictable system. This study aims to compare and synthesize anthropological and ecological data on range management to gather new insights into decision-making processes.

As an example of local knowledge, we take the perception of fodder plant values and ask about:

Correlation: Are there differences between local and ecological ratings of fodder plants?

Criteria: What are local criteria for assessing and ranking fodder plants?



Fig. 1: Satellite image of the study area. The case study is situated in an arid African savanna in the north-western parts of Namibia. Rainfall averages 300 mm/a, its variability exceeds 30%. Vegetation is a secondary mopane savanna. Research was conducted in a village of OvaHerero pastoralists. Livestock mainly consists of cattle, goats and sheep. (Source: ACACIA Partial Project E1, map based on Landsat 7 satellite image)

Methods

Anthropological Methods to Assess Local Rating of Fodder Plants:

- Free listings (list of important fodder plants)
- Pile sorting (classification of fodder plants)
- Participant observation & Interviews

Ecological Methods to Assess Fodder Plant Performance:

- Cover values [%] of plant species in pastures around the village (estimated on 1000 m² plots)
- Assignment of species to life forms

Synthesis of Anthropological & Ecological Datasets:

Local and ecological datasets on fodder plants were directly contrasted by analysing them with the Smith’s Index^a, a weighted rank index. It determines the importance of an item (here: plant species) within the dataset.

For anthropological data this is based on:

- Rank of item in the Freelist of each informant
- Item frequency in all collected lists, and
- Individual length of the informant’s list.

This approach is directly transferred to the ecological dataset: The plot is equated with an informant, the species occurring in a plot are ranked according to species’ cover values.

For simplicity, Smith’s Index will be referred to as the “Weighted Rank”.

Results & Discussion

No correlation between ecological and local ranking of fodder plants

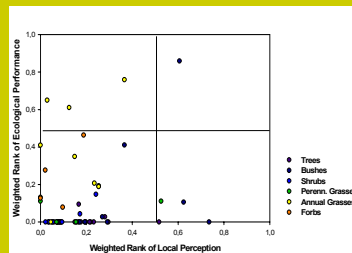


Fig 2: Local vs. Ecological Ranking - Weighted Ranks of the 60 most important species (with local and/or ecological Weighted Ranks > 0,02).

Correlation: Local and ecological rankings differ significantly ($R = 0.161$, $p > 0.05$).

Criteria: Is the life form of a fodder plant a local criterion for its rank?

Proportion of woody species is much higher in the local dataset

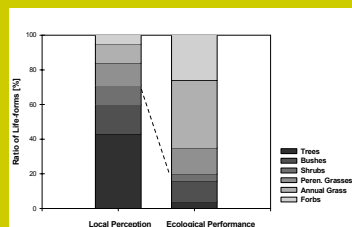


Fig 3: Life form spectra - Local and ecological ratings of life forms (species classified into three woody and three herbaceous life forms; dotted line separates woody and non-woody species).

The higher proportion of woody species in local rating is an indication of a higher value of those life forms in local perspective.

What makes woody species so salient from local perspective?

Woody species are seen as the main source of fodder in scarce times of the year

Tab. 1: Table of the local salience of fodder plants for different kinds of livestock in the scarce times of the year (late dry season).

[%]	Cattle	Goats	Donkeys
Woody species	72	88	72
Perennial grasses	14	6	14
Annual grasses	14	0	7
Forbs	0	6	7

Discussion of Differences

In this study species cover values are taken as a measure for ecological performance. As there is no clear correlation between ecological and local ranking (Fig 2), species performance is apparently not a main determinant of local rating.

In our study, local salience and ecological importance of fodder plants do not correlate because local land users perceive woody species to be more important than herbaceous species.

Difference: Habitat Type

OvaHerero pastoralists present a very broad vocabulary of terms in the domain of fodder plants. They mention more species than are sampled in our ecological dataset. As common in range ecology, plots are located in plain pasture areas. In contrast, local peoples’ iteration of fodder plants do often not refer to this habitat type, but to other habitats like mountains and riverbeds. Ecological data sampling should in future be extended to these habitats to represent spatial distribution of natural resources.

Difference: Scarce Times

In local perception woody species have a higher rank as fodder plants because they are an important source for animal nutrition in times of scarcity, like bushes, shrubs and trees as a reliable fodder source in a highly variable environment.

Conclusions

➤ Not species performance, but relevance for livestock herding under stressful conditions is an explanation for local ranking of plants

➤ Importance of grasses in range science is not reflected by local salience and has to be re-adjusted for secondary savannas

➤ Interdisciplinary approaches contribute valuable information for identifying local preferences and indicators

References

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^bKaschula S.A., Twine W.E. & Scholes M.C. (2005) Coppice harvesting of fuelwood species on a South African Common: Utilizing scientific and indigenous knowledge in Community Based Natural Resource Management. *Human Ecology*, Vol. 33, No. 3, pp. 387-418.

^cMüller B., Linstädter A., Bollig M., Frank K. & Wissel C. (submitted) Learning from indigenous knowledge: modelling the pastoral-nomadic range management of the Ova-Himba. – Submitted to *Journal of Applied Ecology* August 2006.

^dSchareika N. & Bierschenk T. (eds.) (2004) *Lokales Wissen- Sozialwissenschaftliche Perspektiven. Mainzer Beiträge zur Afrika Forschung* Band 11. Münster, Lit-Verlag.