



The role of bio- and landscape diversity in farming strategies - the case of the Keetmanshoop commercial farms

Stephanie Domptail
University of Giessen, Germany

About the study and its aim

- Descriptive
- Qualitative
- Aim:
 - See whether bio and landscape diversity is important in farmers land use strategies
- Why?
 - Understand which knowledge and criteria are the basis of the actual commercial system
 - Guide for development of management skills
 - See where research can assist farmers in their decision making

Research questions and hypotheses

- Definition: Land use strategies= rules and decision systems of the farmers which determine their land use
- Which elements of knowledge enter the land use strategies of commercial farmers?
- Hypotheses
 - Biodiversity (species level)
 - Ecological knowledge
 - By induction: landscape diversity

Methods

- Qualitative data analysis
- Elements of cognitive anthropology
 - Cognitive anthropologists study how people understand and organize the material objects, events, and experiences that make up their world
 - *Cultural domain analysis* consists of a set of structured interviewing methods including free lists, pile sorts, and triad tests.
- Narratives analysis
 - to understand how farmers perceive the ecology of their veld
- Interviews: structured
- Sample: 20 farmers

Case study: commercial farms in the Karoo

- Peri-urban ranching
- 150 mm rainfall
- 0.67 coef. Variation
- Study area= 550 000 ha
- Interviews cover 46%
- Mostly Afrikaans farmers
- Av. Age: 51
- ½ depending only on farming



RESULTS

1. Knowledge in biodiversity, veld resource diversity
2. Knowledge and perception of veld ecology
3. Indicators and factors determining grazing management

1a. Knowledge in biodiversity

- We looked at plants known by farmers to characterize good and bad veld.
- ⇒ 9 grass species (6 *Stipagrostis*) and 19 bush species mentioned on free listing (N=14, mostly older full time Afrikaans farmers)
- ⇒ Combined with field trips (N=20):

Number of plants named and shown by farmers	52
of which the Latin name was identified	37
of which are present on the Gellap observatory	33
% of the total Gellap observatory species diversity	20 %

1b. Perception of veld resources

Aim: to understand how **farmers organize** mentally their veld resources.

- Factors characterizing veld resources :

Topography:	12
Carrying Capacity:	7
Veld types:	7
Soil:	7
Vegetation:	4

Less than 4 citations:

**Indicator species, asset for farming system,
Rainfall, Camp size, Rangeland condition**

=> Major result: organization around veld types and topography rather than degradation

- Selected characteristics of veld types:

Veld types	CC	Quality production	Quality ecology
1. Hard stony soils (Torra, Vlakter)	low		difficult to generate
2. Hard soils with bushes (Ranterveld, Bossieveld)		good grazing quality / nutritious bushes	
3. Sand and soft soils	high	good quality grass, best veld	sensitive to drought and overgrazing
4. Mountain veld	high 1SSU/3ha	high quality, availability of fresh grass late in the season	
5. River Beds	high (1/3)	Grass and bushes dry season	
6. Limeveld		low grazing quality	
7. Brakveld			

⇒ The veld type concept encloses vegetation and geographical characteristics and makes the link with specific ecological dynamics and features related to farming: CC, sensitivity to grazing

⇒ Most types have some advantages. Mountain veld and river appear as key resources

2. Veld ecology

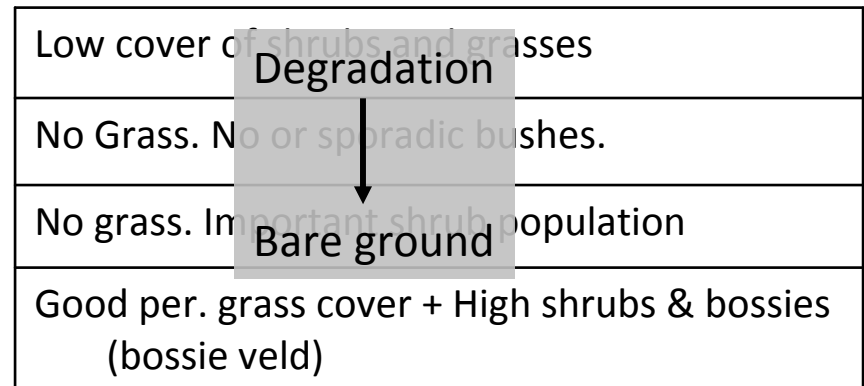
Aim: to see how farmers perceive the degradation and recovery processes of the rangeland

- Analyses of narratives on restoration and degradation experiences (37):

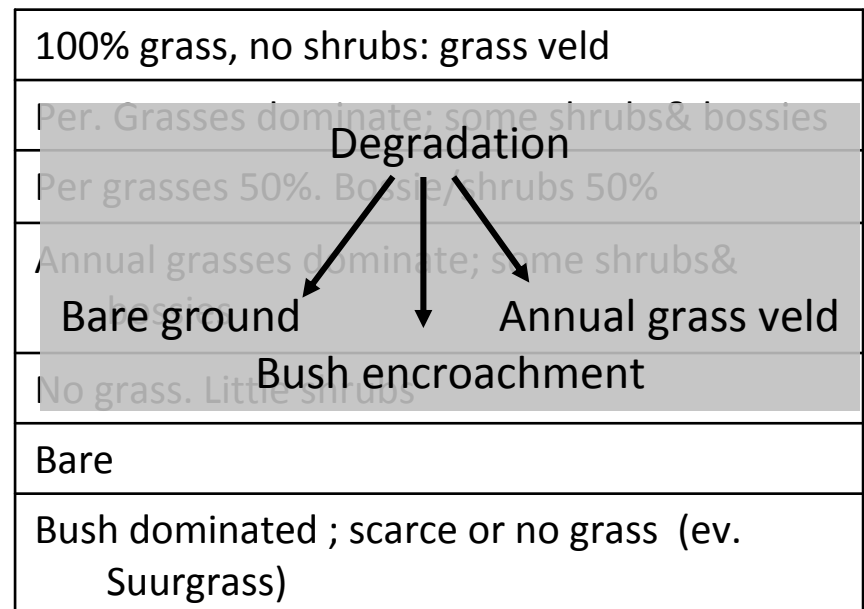
⇒ Farmers recognize discrete states of 'health' of the veld.

⇒ Based on a gross awareness of different dynamics on 'soft' and 'hard' soils.

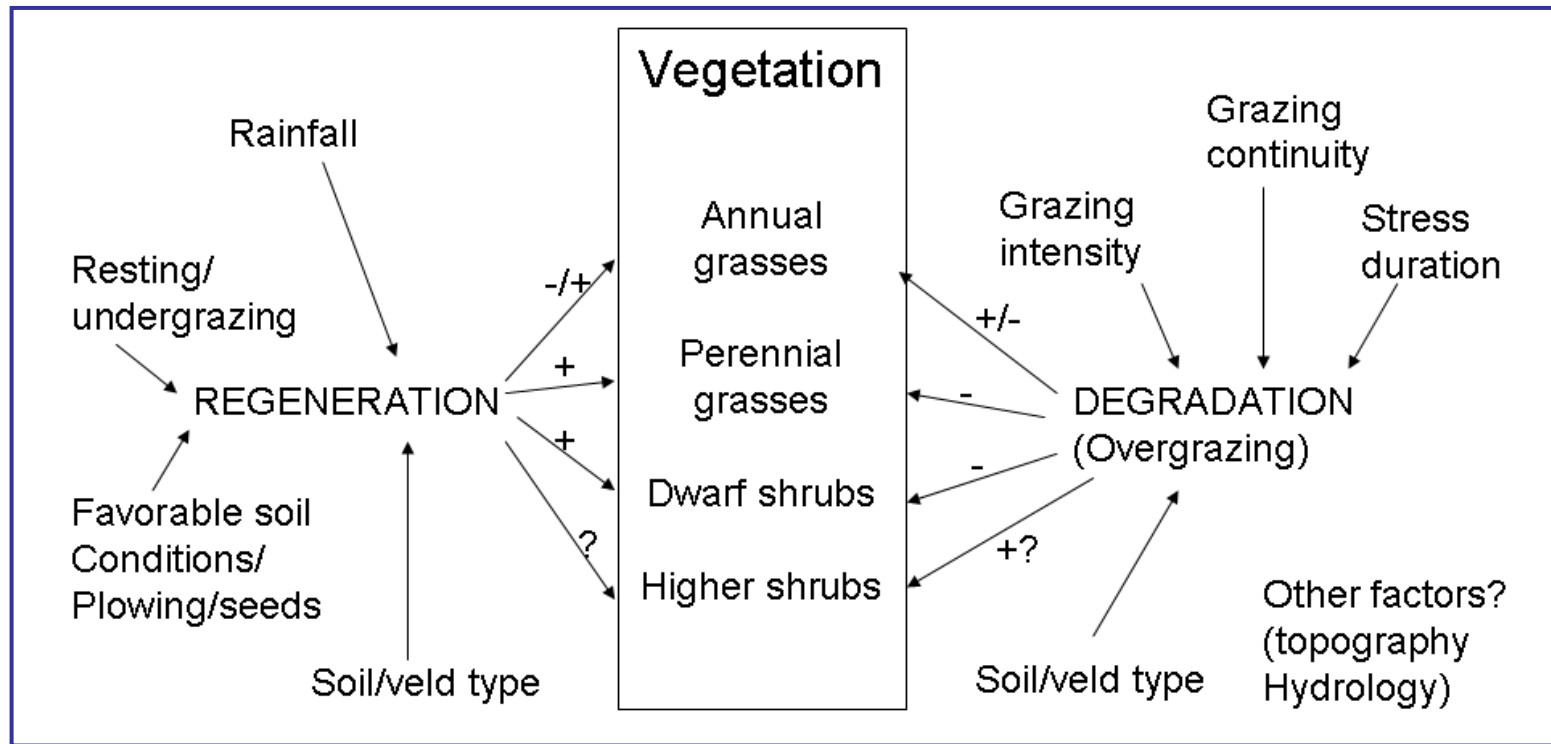
Hard soils



Soft soils



- Perception of regeneration and degradation processes:



- ⇒ Farmers understand that many factors play a role in the path of degradation/regeneration
- ⇒ Veld types play a role
- ⇒ Reductionist consideration of the veld with each vegetation layer considered independently; no attention to soils

3a. Indicators in rotation systems

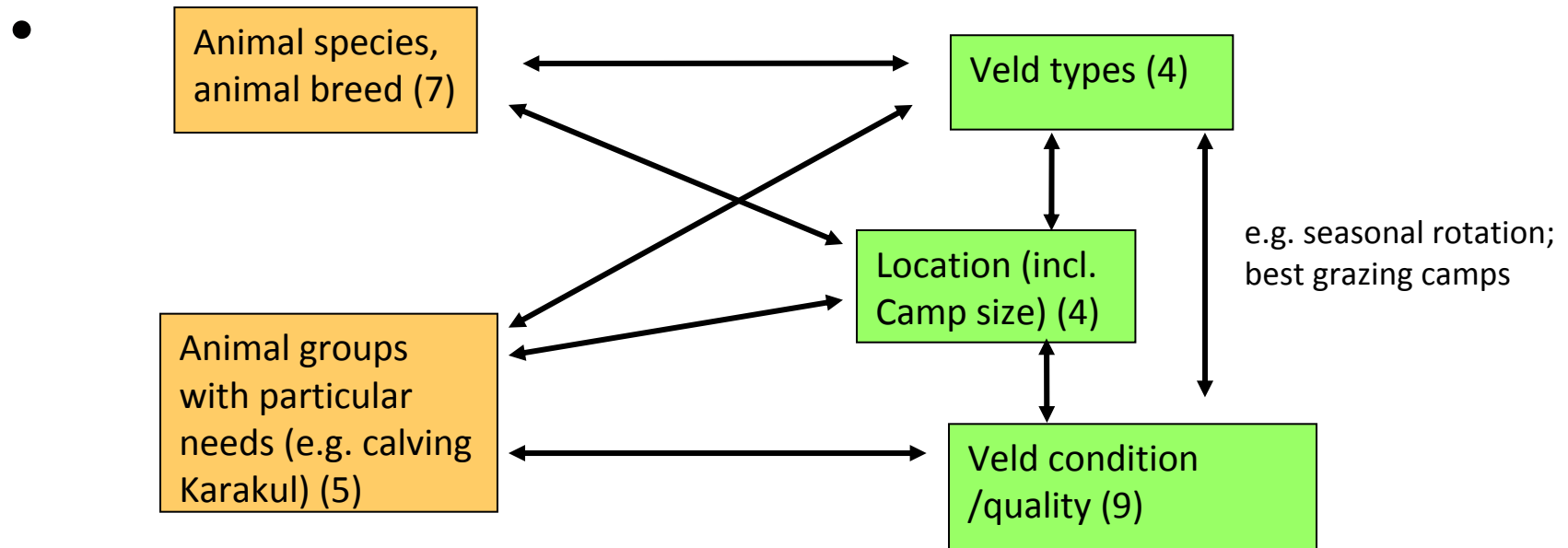
Aim: see which types of indicators are in use and whether they seem appropriate for GVM

<i>Indicators cited</i>	<i>Frequency of citation</i>
vegetation indicators	33 Grass length (10) Dwarf shrub biomass (9) Overall biomass present (8) Avoid grazing young shoots (3) Ripening cycle of shrubs (2) condition of best palatable plants (1)
Alternative veld (existence)	4
Livestock condition/behavior	9
Soil condition	2
Rainfall amount and pattern	2
wild animals (presence)	1
	51

=> Indicators tend to be quantitative and not species based. They are mostly plant based and some consider the qualitative aspect.

3b. Rotational systems: factors affecting land use

Aim: understand how farmers make their decisions on the allocation of animals on camps in space and time



=> 5 main factors

=> Decisions taken considering the veld condition and landscape ecology. But there are several constraints, related to the herd management systems and socio-geographical reality of the farm.

Concluding

Summary of results

1. Species knowledge existent but concerns the most common plants. Specific species are rarely used as indicator for veld management. Rather, productivity (biomass) is the main factor.
2. Veld types appeared as a main concept used by farmers (even new comers) to address the veld resources. This is to be linked with the high landscape diversity in the study area. They are used to address adequate allocation of livestock on the veld.
3. Ecological knowledge is present. Discrete states are recognized. Veld types are recognized to affect paths of degradation and regeneration. But perception of ecological process not holistic.
4. Land use strategies are based on veld characteristics, aim at adequately matching livestock needs and veld type and condition, but there are constraints.

Consequences for management

1. Species knowledge existent but not put at use

BD may be important but is overlooked. This limits potential for monitoring and thus also on-farm conservation.

2. Veld types as a key concept

'It's not just a piece of veld'. All veld types are not equal. Some can be considered key resources. Diversity of veld types at farm level important for management strategies

3. Ecological knowledge is biased by simplistic rangeland concept (grass + shrubs).

There is no eco-systemic consideration of the rangeland in ecological knowledge. Information about specific ecological dynamics of veld types are virtually inexistent.

4. Land use strategies based on veld characteristics under constraints

It is important to try and alleviate the 'socio-geographical' constraints (in the design of new farming systems) in order to improve the veld-livestock relations.

Anecdote

- The case of Lovedale Farm, with manager Campbell, young Boere van die Jaare 2007 in Karas region.
- High BD, high stocking rates, high labor use, high diversity of livestock and types of products (karakul studs, wool, sheep and cattle meat), intensive management, and very low rainfall (80mm) with high variations.
- Statement: 'Other farmers only have two types of grasses left: they have no choice than to go for Dorper monoculture'...



Implications for research in the South

- Recognize and research the diversity of veld because
 - local knowledge
 - improve management
 - Improve potential of on-farm conservation
 - Holistic view of rangelands (rangelands as ecosystems)
- Research the link between BD and LT productivity
 - Justify conservation
 - Guideline for education of farmers
- Research seeks to create new ways to look at things
 - => From production to ecosystem management

Many thanks for you attention

