Rangeland desertification and land use changes on commercial land in Namibia's Waterberg region



Tropentag 2022, Prague

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Introduction

- Looming desertification and ongoing climate change put semi-arid rangelands under increasing pressure. ^[1]
- In Namibia, cattle farmers are repeatedly forced to apply short-term risk coping and long-term risk mitigation strategies to maintain their farming business.

Study region



Methods



 To sustain rangelands, a deeper understanding of land use and land cover changes, their drivers, and related desertification effects is necessary.

Results



The promotion of commercial cattle farming through subsidization resulted in ... ^[2]

- \rightarrow the division of rangeland into camps
- \rightarrow the expansion of water infrastructure
- \rightarrow rapidly increasing cattle numbers

2 Land use and land cover changes after 1960

Important changes over the past 60 years include ...

- → bush encroachment and its containment by bush control
- → subdivision of rangeland into smaller management units
- \rightarrow income diversification



Drought
 Above average rainfall
 Foot & Mouth Disease

3 Farmers' responses to change & desertification

Farmers apply...



Short-term risk coping strategies to maintain farming operation, prevent overuse & rangeland degradation

Long-term risk mitigation strategies to maintain/ improve rangeland





Woodland Shrubland Grassland savanna Camps 0_1_2
Water area Barren land *C*ropland DFarm boundary



Conclusion

A combination of natural conditions, climatic trigger events, subsidies encouraging expansion, and related changes in rangeland management push degradation ahead and drive desertification in the long term.

climate-driven land cover modification (e.g., seasonal fluctuations)

intrinsic vegetation processes (e.g., shift, succession)

References

[1] Mirzabaev, A. et al. (2019): Desertification (Climate Change and Land: An IPCC special report).

[2] Lau, B. & Reiner, P. (1993): 100 Years of Agricultural Development in Colonial Namibia. A historical overview of visions and experiments.Windhoek, Namibia: Windhoek Printers and Publishers.

Acknowledgements



The data for this research was collected within the framework of the NamTip project funded by the German Federal Ministry of Education and Research (FKZ: 01LC1821A-E). The fieldwork was funded by the DAAD PROMOS scholarship.

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Federal Ministry of Education and Research