



## Factsheet # 12

# Desertification as interlinked crisis situations and freehold farmers' responses



## Challenge

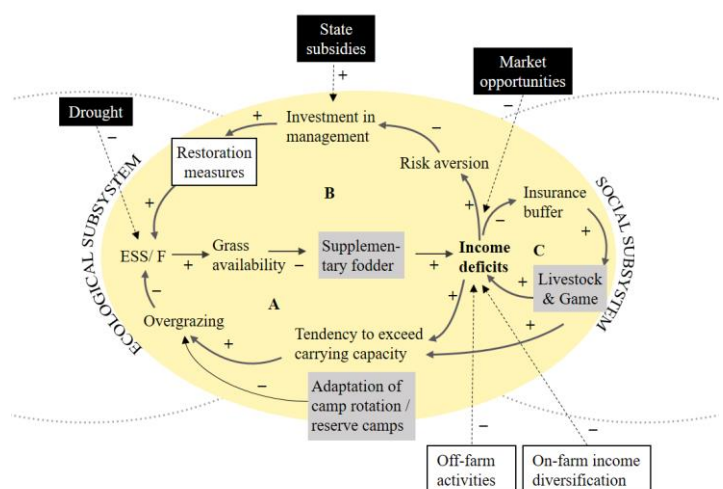
- In Namibia, desertification is mainly associated with overgrazing, overstocking and droughts, but other factors contributing to desertification are rarely discussed.
- The interlinkage of crisis situations leading to cycles that perpetuate adverse conditions and trigger desertification are not well understood.
- Understanding the interlinkage of crisis events can help to differentiate freehold farmers' short-term coping and long-term mitigation strategies.

## Approach

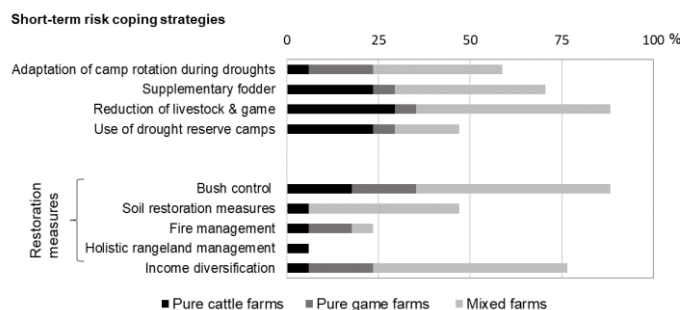
- Our research focused on freehold farms in the broader Waterberg area in Namibia, which are individually owned and managed.
- The analysis integrated remote-sensing methodologies, archival research, and interviews with farmers.
- We identified the interlinkages of crisis situations on the farms (e.g. low grass availability, income deficit) and the external ones (drought, lack of state subsidies, poor market opportunities), as well as farmers' strategies to tackle desertification (Fig. 1).

## Interlinkage of crisis situations

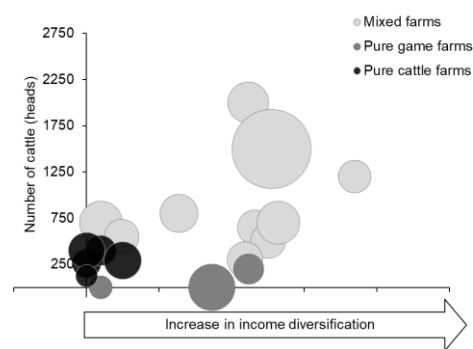
- Income deficits are the central link between the rangeland management practices cycle, the rangeland management investment cycle and the capital management cycle.
- Freehold farmers short-term risk coping strategies and long-term risk mitigation strategies have an effect on different factors of the cycles.



**Figure 1.** Qualitative model showing the interlinkages of crisis situations on the farms and the external ones (black boxes). Represented are the rangeland management cycles with regard to practices (A) and investments (B), and the capital management cycle (C). The farmers' accompanying short-term risk coping strategies (grey boxes) and long-term risk mitigation strategies (white boxes) are illustrated. The arrows characterize the links between the factors within the cycles (+ = both factor's values change in the same direction; - = a change in one factor induces a change in the other factor in the opposite direction)., ESS/F = ecosystem services and functions.



**Figure 2.** Short-term risk coping strategies and long-term risk mitigation strategies applied by the surveyed freehold farmers ( $n = 17$ ) to ensure fodder availability. Farms were classified on the basis of their main income strategies (cattle, game (guest/hunting tourism), mixed with several sources of income).



**Figure 3.** Income diversification (x-axis, based on Berry Index), number of cattle (y-axis) and farm size (represented by the size of the circles) of the interviewed freehold farmers in the Waterberg region ( $n = 17$ ).

## Coping and mitigation strategies

- Short-term risk coping strategies are often applied by freehold farmers as an immediate response to drought (Fig. 2).
- Long-term risk mitigation strategies are applied in response to dwindling fodder resources due to desertification. Such strategies could improve rangeland conditions in the long term as reported by freehold farmers (Fig. 2).
- Income diversification (Fig. 3) is a key mitigation strategy, which has the potential to reduce stocking rates to the carrying capacity of the land.

## Key Findings

- Inadequate grass availability coupled with income deficits serves as a pivotal catalyst for rangeland desertification.
- Bush control and income diversification (Fig. 3) are the most widely used long-term risk mitigation strategies. While bush control is only a temporary solution, income diversification (e.g. tourism) can maintain or increase farm income and at the same time reduce the grazing pressure on the rangeland for a long time period. Income diversification tackles income deficits, which are the central link between the cycles.

## Practical and Policy Implications

- Incentives and targeted training can foster the implementation of sustainable long-term risk mitigation strategies and can reduce risk aversion.
- Establish demonstration areas and model farms to show how restoration measures (e.g. via planned grazing management) can be successfully implemented.
- Detailed long-term investigation of the effectiveness of the already applied mitigation strategies and other possible mitigation strategies is needed.
- Recognizing the interlinkages of crisis situations can help to design tailored mitigation strategies addressing key factors of the cycles.

## References

Grieger, L., Brinkmann, K., Rauchecker, M., Liehr, S. (2025). Desertification as a Social–Ecological Trap: How Does It Come About and What Are Namibian Freehold Farmers Doing About It? *Land* 2025, 14(5)  
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## Authors

Katja Brinkmann, Markus Rauchecker & Stefan Liehr, Institute for Social-Ecological Research (ISOE) & Senckenberg Biodiversity and Climate Research Centre (SBiK-F), Germany. Contact: [katja.brinkmann@isoe.de](mailto:katja.brinkmann@isoe.de)  
 Lena Grieger, Institute of Physical Geography, Goethe University Frankfurt, Germany

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### The NamTip Project

The collaborative German-Namibian research project “NamTip – A Namibian Perspective on Desertification Tipping Points in the Face of Climate Change” aims to better understand the development of ecological tipping points in dryland rangelands by assessing desertification and woody plant encroachment processes. It also explores management options for preventing such tipping points and restoring degraded rangeland ecosystems.

[www.uni-potsdam.de/en/namtip](http://www.uni-potsdam.de/en/namtip)

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### Project Lead

Prof. Dr. Anja Linstädter  
 E-Mail: [anja.linstaedter@uni-potsdam.de](mailto:anja.linstaedter@uni-potsdam.de)

**Editorial Committee:** Bertus Kruger, Thomas Bringhenti, Stefan Liehr, Markus Rauchecker, Alexandra Sandhage-Hofmann, Katrin Zimmer

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