



## Factsheet # 11

# Towards resilient forage production in Namibian rangelands



## Challenges

- Stable forage production is essential to use savannas as rangelands.
- The amount of forage production on rangelands depends on the complex interplay of many factors, e.g. land-use history and grazing pressure.
- Perennial grasses are of critical importance in drier years, when annual grasses are not growing, even though they are not the most palatable plants.
- A healthy plant community with a high proportion of perennial grasses is key to a resilient rangeland.

## Approach

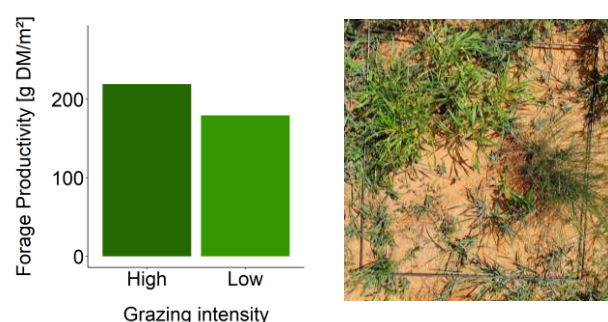
- We conducted a field experiment to assess how different levels of grazing pressure affect forage productivity and which plant types contribute to the biomass.
- Additionally, we measured forage production potential on communal and freehold rangelands using enclosure cages.



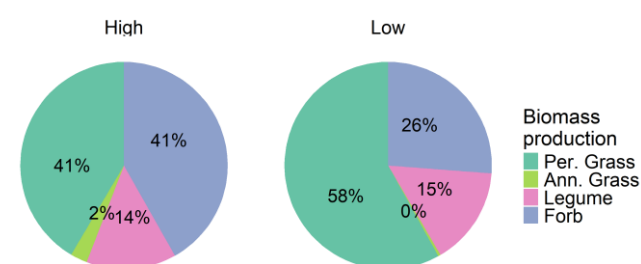
**Fig. 1:** Left: Field experiment on a healthy rangeland to explore the impacts of grazing and drought on forage production and vegetation with simulated grazing. Right: Grazing enclosure cages installed to assess vegetation and forage production potential in a whole growing season without grazing. Photo credits: Vistorina Amputu, Lisa-Maricia Schwarz

## Grazing effects on healthy rangeland

- Grazing increased productivity through, e.g. regrowth
- In our experiment, we found higher annual forage productivity after two consecutive years of high grazing pressure compared to low grazing pressure – but only within a healthy rangeland and under good rainfall conditions (Fig. 2).
- However, there was a pronounced decline in perennial grass production, while forb production increased (Fig. 3).



**Fig. 2:** Left: Forage productivity (dry matter, DM) at high and low grazing pressure in a historically healthy rangeland. Right: Example of an assessment square. Photo credit: Lisa-Maricia Schwarz



**Fig. 3:** Average biomass production per plant type on healthy rangeland. Left: Under high grazing pressure. Right: Under low grazing pressure.

# Forage production potential in communal and freehold rangelands

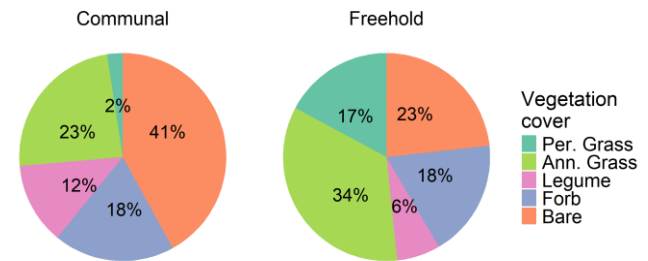
- Within the cage approach, we found that the forage productivity potential was higher on freehold farms (Fig. 4).
- Grass cover on freehold rangelands was twice as high as on communal rangelands, while the extent of bare ground was nearly halved (Fig. 5).
- Perennial grass proportion was higher on freehold farms (Fig. 5).
- The rangeland conditions can be explained by differences in grazing management and historical land distribution.



**Fig. 4:** Left: Forage productivity on communal and freehold farms measured in grazing enclosure cages. Right: Impression of communal rangeland. Photo credit: Lisa-Maricia Schwarz

## Practical Implications

- Include **plant types** in forage production assessments.
- **Monitor** the status of **perennial** grass populations (see Factsheet #6).
- In **communal areas**, grazing strategies that allow the land to **rest** need to be incentivised - for example, by using a split grazing system (see Factsheet #8).
- On **freehold farms**, protect and **maintain perennial grasses**, as they are key to resilient forage supply.



**Fig. 5:** Average vegetation cover in grazing enclosure cages on communal vs. freehold rangeland.

## Key Findings

- Intensive grazing on healthy land reduces perennial grass biomass production but not immediately the total forage production.
- Under high grazing pressure, forbs replace perennial grass production, which in the long run reduces the potential forage production and resilience.
- Freehold farms have a higher forage production potential and more perennial grasses compared to communal areas.
- The resilience of communal rangeland can and needs to be improved.

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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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