



Tropentag, September 15-17, 2021, hybrid conference

“Towards shifting paradigms in agriculture
for a healthy and sustainable future”

Cut it or Keep it - Is Recovery Time the Key to Healthy Rangeland?

SABINE BAUMGARTNER¹, ANNA C. TREYDTE²

¹*University of Hohenheim, Ecology of Tropical Agricultural Systems, Germany*

²*Stockholm University, Dept. of Physical Geography, Sweden*

Abstract

Despite the importance for the livelihood of millions of people worldwide, many semi-arid African savannahs are prone to heavy degradation caused by overutilisation and increased climate variability. Rangeland management can strongly affect the rangeland condition and its productivity. The Maasai traditionally practice transhumance and seasonal exclosures, granting seasonal resting time between rangeland use. However, few studies have quantified the effect of resting under current overuse and climate change challenges.

We collected data on grass and forb biomass in experimental plots exposed to different resting time after cutting (monthly versus seasonal) and under different wildlife accessibility (fenced versus open). Measurements were done in different rangeland types (rainy season rangeland, dry season rangeland and seasonal exclosures). We conducted the experiment during a dry growing period (GP1) and a wet growing period (GP2).

Grass biomass during GP1 was highest in fenced plots with seasonal resting time. Wildlife grazing resulted in significantly lower grass biomass compared to fenced plots. During GP2, we found higher grass and forb biomass in plots with seasonal compared to monthly resting time and no effect of wildlife grazing. Mean forb biomass increased by five times during wet conditions in GP2 compared to dry conditions in GP1, whereas mean grass biomass doubled. These trends were similar for all three rangeland types.

Our results suggest that seasonal recovery phases between heavy grazing events can help to maintain forage provision of rangelands in our study region. Limited forage resources during dry conditions can, however lead to competition between livestock and wildlife. Forbs seem to profit more from increased rainfall than grasses, especially in already disturbed areas. We conclude that traditional Maasai rangeland management, based on seasonal recovery periods, can support rangeland productivity despite intense grazing and unpredictable rainfall pattern. To avoid the dominance of undesired plant species, additional restoration measures are necessary.

Keywords: Productivity , rainfall pattern , rangeland management , recovery time