

# News

June 2023

## The potential of reseeding and resting

The first season of the reseeding experiment in communal grazing areas was successfully completed. Reseeding and resting can help farmers to obtain forage even in the dry season. As germination rates of perennial grass species are usually quite low, we want to investigate some pre-treatments of the seed before sowing. Our PhD student Nali Moyo will continue her research in the second project phase of NamTip.



May 2023

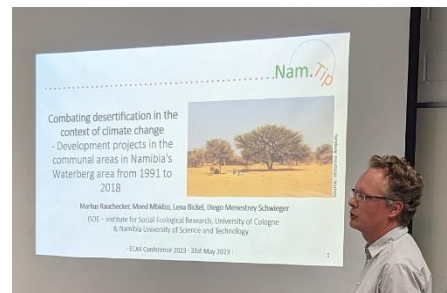
## PhD students at the International Grassland Congress 2023

During the 25th International Grassland Congress in Covington, Kentucky, our two PhD students Florian Männer and Lisa-Maricia Schwarz presented some of the results of their studies. Florian Männer gave a talk on "Predicting forage provision of grasslands across climate zones by hyperspectral measurements" and Lisa-Maricia Schwarz presented a poster on "[Evaluating functional diversity as potential early-warning indicator of rangeland degradation](#)".



## NamTip represented at the 9th European Conference on African Studies

Our researcher Markus Rauchecker presented a paper on "Combating desertification in the context of climate change - Development projects in the communal areas in Namibia's Waterberg area from 1991 to 2018" during the 9th European Conference on African Studies in Cologne. The presentation was given as part of the session "Adapting to and combating climate change in Africa's drylands".



February 2023

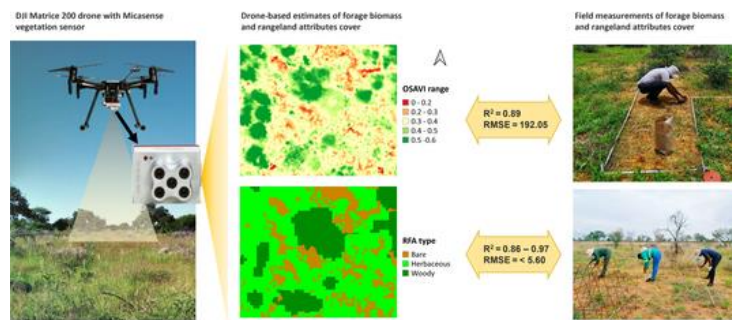
## Overcoming Namibia's worst drought in the last 40 years: Ethnographic insights from Okakarara constituency

[This paper](#), authored by Diego Menestrey, analyses the practices of Ovaherero pastoralists in the Okakarara constituency to keep their cattle herds alive, the challenges they experienced thereby, and the strategies used for recovering their livestock losses in the context of the 2019 severe drought. This ethnographic study reveals that essential drought-coping practices, such as livestock mobility, along with various long-term risk reduction mechanisms, such as reservation of emergency pastures and social institutions of exchange, are limited in the communities described in this research. The paper discusses the main reasons for these conditions and their implications for local farmers, considering that more frequent droughts of similar severity are projected for the coming years in the region.

January 2023

### Unmanned aerial systems accurately map rangeland condition indicators in a dryland savannah

A new NamTip paper has been published. This [methodological paper](#) with first author Vistorina Amputu used field measurements to test how accurately and efficiently indicators of rangeland condition (forage biomass and rangeland attribute cover) can be estimated using drone technology in a Namibian dry savannah. The paper demonstrates and confirms that drone-based predictive models offer the possibility for more efficient, flexible, unbiased and timely monitoring of vegetation parameters in drylands. This is highly relevant to better inform land management policies and adaptive decision-making in the Anthropocene era.



December 2022

### Special issue: completed master and bachelor theses

On the occasion of the end of the year, we would like to take a look back and honor the final theses of our students. For example, this year Lena Bickel (top left), Melissa Gurny (top right) and Katinka Mustelin (accompanied by Moomins) have achieved their master degrees. Lena examined "Rangeland desertification and land use changes on commercial land in Namibia's Waterberg Region over the past 60 years", Melissa investigated "Bush fodder production on commercial farms in the Waterberg region, Namibia: Challenges and Potentials" and Katinka's topic was "Livelihood security in the face of looming desertification: exploring long-term social-ecological dynamics using an agent-based model". Additionally, we would like to acknowledge the bachelor's degree of Lena Barth, who wrote her thesis on "Land degradation assessment using Residual Trend Analysis (RESTREND) of Enhanced Vegetation Index (EVI), soil moisture and rainfall in Greater Waterberg Landscape, Namibia, from 2001 to 2020". We congratulate you all and wish you all the best for the future!



November 2022

### New experiment set up in communal areas

In preparation for the second funding phase, we have set up a first test version of a pasture restoration experiment. This was inspired by initial results suggesting a reintroduction of drought resistant grasses with good forage quality. The species chosen are Silky bushman grass (*Stipagrostis uniplumis*) and Buffel grass (*Cenchrus ciliaris*). The main person responsible for the experiment and its evaluation is our PhD student Nali Moyo, who specializes in proactive management strategies. We are looking forward to her first results inspecting the effects of reseeding and resting with some moderate grazing at camp level.



## End-of-dry season TipEx assessments done!

At the conclusion of the first year of a full drought and grazing treatment in the Tipping Point experiment, repeat measurements of key perennial grass species were successfully conducted before the start of the 2022-2023 rainy season. We are particularly interested in their survival and re-establishment.



## October 2022

### 4th Ecosystem Services Partnership (ESP) Europe Conference

Members from NamTip and MoreStep organized the session “Ecological tipping points and societal transformation processes in social-ecological systems” at the 4th Ecosystem Services Partnership (ESP) Europe Conference in Heraklion, Greece. In the session, NamTip student Lena Bickel gave a talk on “Rangeland desertification and land use changes on commercial land in Namibia’s Waterberg region” and NamTip researcher Markus Rauchecker presented a paper on “Post-independence development projects to combat desertification in communal areas in Namibia’s Waterberg region”.



## September 2022

### Okakarara Field Day

As part of the Namibian Rangeland Forum, there was an extra day in the field where local communal farmers were invited. The Tipping Point Experiment was visited and there were exciting presentations by our team members.



### Namibian Rangeland Forum

Several NamTip scientists enriched the Namibian Rangeland Forum with their contributions and discussed with local farmers and stakeholders.



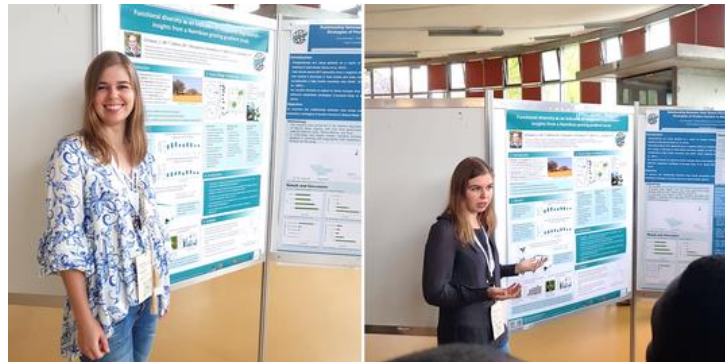
### Hybrid general assembly

The NamTip general assembly was held in hybrid format this time. This year we were especially pleased to have more time for exciting and fruitful discussions.



### Poster presentations at Tropentag

The NamTip project was represented with three poster presentations at Tropentag 2022 in Prague. Lena Bickel presented the topic of her Master's thesis "[Rangeland desertification and land use changes on commercial land in Namibia's Waterberg region](#)", Melissa Gurny also presented the topic of her Master's thesis entitled "Bush fodder production on commercial farms in the Waterberg region, Namibia: challenges and potentials" and PhD student Lisa-Maricia Schwarz presented results on "[Functional diversity as an indicator of rangeland degradation - insights from a Namibian grazing gradient study](#)".



### August 2022

#### Focus on soil science

Our PhD student Katrin Zimmer, who specializes in soil science, presented her results regarding "Drivers of rangeland degradation in Namibian semi-arid savannas" with a poster at the World Congress of Soil Science in Glasgow. At the conference of the German Soil Science Society in Trier, Germany, we were able to listen to an exciting presentation by her.



### July 2022

#### TipEx gets public attention!

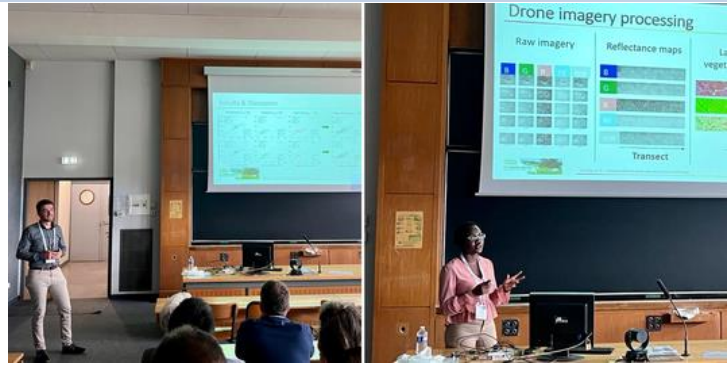
An excursion group from the University of Bonn visited our TipEx experiment at Hamakari Farm. The approximately 20 visitors first got an insight into the theoretical background of the experimental setup and then could experience its implementation on site.



June 2022

### Science communication at the European Grassland Federation Symposium 2022

Our Remote Sensing PhD students Vistorina Amputu and Florian Männer present forage quality models using hyperspectral data and how accurately drone technology maps arid rangelands.



May 2022

### Fieldwork on development projects to combat desertification

We wanted to find out how desertification and rangeland policies are implemented on the ground. We focused on five development projects to combat desertification, which were implemented in the communal areas of the Waterberg region since 1991. We interviewed representatives from state entities, universities and NGOs, who were part of these projects. Additionally, we collected project documents from state and private archives.

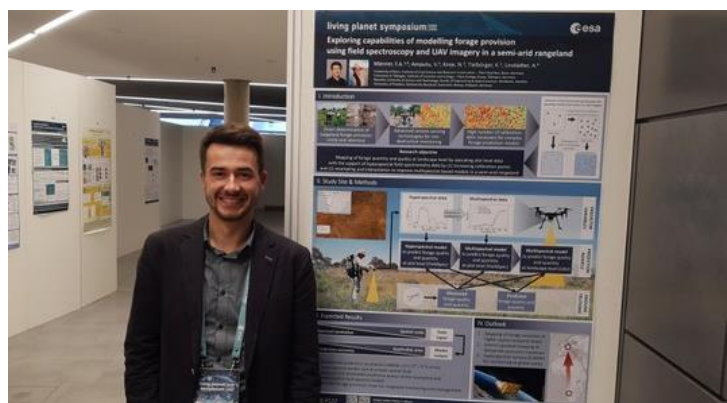


### Interview - why are deserts growing worldwide

A radio interview with Prof. Dr. Anja Linstädter on "Why desertification is increasing worldwide" was broadcast on Deutschlandfunk. You can listen to it [here](#).

### The first conference contribution on site!

Florian Männer presented at the Living Planet Symposium 2022 of the European Space Agency ESA with the poster "[Exploring capabilities modeling forage provision using field spectrometry and UAV imagery in a semi-arid rangeland](#)" Vistorina Amputu's and his idea of upscaling forage quality and biomass production of the Namibian savanna to landscape level.



April 2022

### Second NamTip Student Seminar

In order for everyone to be up to date and to experience exciting first results, there was the second big event of NamTip Master and PhD students.

*February 2022*

### **Return to our long-term experiment**

Now that the experiment with all its exciting facets has finally been set up after great efforts, we were able to return this year to collect data. The great strength of the experiment "TipEx" unfolds through the long-term monitoring of numerous ecosystem components. Due to the removable roof parts, we can repeatedly take and analyze images with the drone during the entire vegetation period.



*January 2022*

### **Learning and improving statistical knowledge**

The year started off on a good note for the Namibian NamTip students as they participated in an intensive 2-weeks course on ecological statistics in R software. The training which took place in Windhoek was organized and facilitated by Dr. Mark Bilton, a Statistician by profession. It covered among others, an introduction to R; linear models: ANOVA, Regression, Post-hoc tests; Mapping species distributions, and Advanced graphics. In one of the students' words, "The R course was really helpful in understanding not only how to use R software for data analysis but also the ecological statistics in general". With the knowledge they acquired, the students are looking forward to exciting opportunities to present their research findings.

*November 2021*

### **Serious Gaming in Namibian Communities**

To explore decision making in rangelands, local farmers were invited to play the serious game "NamSed". Farmers from the communal areas Ombooronde and Ozongarongombe managed their imaginary rangelands and were confronted with challenging events on their game board by our PhD student Hleni Heita.



*October 2021*

### **Dry season fieldwork**

The current vegetation status in our study area: the woody layer is greening up, while the herbaceous layer is largely senescent.



One of our PhD students, Mona Hamunyela, is looking at soil seed bank dynamics collecting soil seed bank samples that will be germinated in the greenhouse. Our near surface remote sensing PhD student, Vistorina Amputu, is currently conducting dry season drone flights in the study area to obtain better Digital Terrain Models.



She has active support in this, because Ground truthing in observational plots along the transects after drone flights is essential.

The presence of living perennial grasses at our experimental site (TipEx) has to be recorded in both rainy and dry season to evaluate the recruitment.



## September 2021

### The big meeting

Like last year, all NamTip scientists and some stakeholders gathered online for our annual meeting on September 27-28. Here we presented and discussed our initial findings, developed plans for the coming year of data collection, analysis and publication, and structured our ideas for the second phase of the NamTip project.

## July 2021

### TipEx Intallation done!

The tipping point experiment (TipEx) is now fully installed. Installation includes fencing off plots from the grazing area, installing rain shelters for drought simulations, installing soil barriers around plots, and installing soil sensors for continuous soil data collection. Full treatment can begin with the first rains in the upcoming 2021/2022 growing season!



### Data, data, and even more data

After the successful fieldwork hundreds of data sheets need to be digitized. Everyone is working diligently and we are curious what our analyzes will yield!



*May 2021*

### **Exploring the commercial farms' land use history**

Following up on the interview results from 2019 and the aerial image analysis we were able to interview the commercial farmers in greater detail. The interview results provide us with further information on land use change and rangeland degradation from their perspective.



### **Successful completion of the main field campaign 2021**

Against all odds our international field team was able to complete the ecological assessments on all sites. Several data sets were collected and further insights on rangeland degradation during our analyses are yet to come.



*March 2021*

### **Revisiting the Tipping Point Experiment (TipEx)**

Our experiment shall reveal the influence of biomass removal and drought on the herb layer. Before the second biomass clipping for the year 2021 on TipEx was conducted, data was collected.



*February 2021*

### **Reunited**

The soil and vegetation team members from Namibia and Germany joined the remote sensing team and started their assessments. We started to take soil samples and plant trait samples, to do infiltration measurements,



vegetation relevés and perennial grass assessments at the eight different sites consisting of four communal areas and four commercial farms.

## January 2021

### In need of a rubber boat

It is still the beginning of the growing season and this dryland system has already received close to half of the rainfall that it gets in an entire period. Skies that are predominantly blue during this time are constantly covered with clouds, river channels that didn't flow for years are now filled with water blocking car tracks and the rangelands are flushed with green.



## November 2020

### Annual assembly of the NamTip scientists and stakeholders

Due to the ongoing limitations caused by the pandemic the assembly took place online. Our team presented the development and progress within the respective studies and discussed the way ahead.

## October 2020

### Introducing the TipEx sign

A sign explaining our Tipping Point Experiment was installed at the Hamakari Farm.



## July 2020

### The first NamTip publication is here!

Our social scientists Diego Menestrey Schwieger and Meed Mbidzo published their article "[Socio-historical and structural factors linked to land degradation and desertification in Namibia's former Herero 'homelands'](#)" in the Journal of Arid Environments.



Journal of Arid Environments

Volume 178, July 2020, 104151



Socio-historical and structural factors linked to land degradation and desertification in Namibia's former Herero 'homelands'

Diego A. Menestrey Schwieger <sup>a</sup> , Meed Mbidzo <sup>b</sup>

May 2020

### Trying to save some data

The Namibian ecologists returned to the field to collect some data in the context of a shortened protocol. Since ecological fieldwork depends on the vegetation period, most fieldwork ends when the dry season arrives.



April 2020

### NamTip species observations on iNaturalist

Plant species observations from our ecology team can now be found on the platform iNaturalist, which also supports the scientific data collection of the Global Biodiversity Information Facility (GBIF).

More information can be found [here](#).



March 2020

### The COVID-19 pandemic stops fieldwork

Due to the local and global exceptional situation the team had to leave the Greater Waterberg area much earlier than planned. The Namibian team members returned home, while the German team members had to leave Namibia.



### The first large ecological field campaign started

Our international team of natural scientists returned to the chosen sites to do their various vegetation assessments.



## When the sand arrives

The local German journal "Südzeit" published an article about the project written by the team members Lisa-Maricia Schwarz, Florian Männer, Katrin Zimmer, Alexandra Sandhage-Hofmann and Anja Linstädter (Südzeit 84: "Sand - schwindende Schönheit").



## October 2019

### First field visit - Preparations, site selections and lots of sand

A big team of collaborators, social and natural scientists visited the Waterberg region. To enable our interdisciplinary study framework joint study sites needed to be selected.



The Tipping Point Experiment will be installed at the Hamakari Farm. Here will be a study area for the "healthy" site:



## September 2019

### Kickoff and Stakeholder workshop in Windhoek (16 - 17 September)

The NamTip team of stakeholders and scientists met in full numbers.



## August 2019

### Interview on tipping points

An interview with PD Dr. Anja Linstädter on tipping points in ecosystems of Namibia was published in Süddeutsche Zeitung (a daily German newspaper). [Link](#)

**NamTip project presented in news magazine *Forsch***

The news magazine of the University of Bonn ("Forsch") published an [article](#) about the NamTip project in its Summer 2019 issue:

▼ Welche Erfahrungen haben Farmer vor Ort zu Kippunkten der Desertifikation? Das Maßband (im Vordergrund) dient den Ökologen der Universität Bonn zur Abgrenzung ihrer Untersuchungsflächen.

## Wenn aus Viehweiden Wüsten werden

### Projekt zu ökologischen Kippunkten der Desertifikation

Wie kann es in Trockengebieten passieren, dass Ökosysteme unter wachsendem Nutzungsdruck plötzlich „umkippen“? Wo vorher Weidegras üppig wuchs, bleibt dann nur der blanke Boden zurück – mit drastischen Folgen für die Ernährungssicherung.

Aufgrund der engen Verzahnung von Natur und Gesellschaft sind diese Tipping Points noch nicht gut verstanden – oft kommen sie als unangenehme Überraschungen. „Sie können jedoch schwerwiegende ökologische und sozio-ökonomische Auswirkungen haben, die schlimmstenfalls unumkehrbar sind“, sagt Projektleiterin Dr. Anja Linstädter vom Institut für Nutzpflanzenwissenschaften und Ressourcenschutz.

„Der Klimawandel wird die Wahrscheinlichkeit für das Überschreiten von Wüstenbildungs-Kippunkten noch drastisch erhöhen“, sagt Linstädter. Im NamTip-Projekt soll daran geforscht werden, Wüstenbildungs-Kippunkte und ihre Auswirkungen auf die Lebensgrundlage der namibischen Farmer besser zu verstehen. Gleichzeitig geht es darum auszuloten, solch ungewollte Effekte zu vermeiden – beispielsweise durch geeignete Frühwarnsysteme.

JOHANNES SEILER



Foto: Anja Linstädter

Ein internationales Team aus Wissenschaftlern unter Federführung der Universität Bonn erforscht in Namibia die ökologischen und sozialen Einflussfaktoren auf solche Kippunkte der Wüstenbildung. Nun startete das deutsch-namibische Projekt „NamTip“, das in den nächsten drei Jahren vom Bundesministerium für Bildung und Forschung (BMBF) mit mehr als drei Millionen Euro gefördert wird.

Seit einigen Jahren rücken Kippunkte (oder „Tipping Points“) in Ökosystemen immer mehr in den Fokus. Veränderte Umweltbedingungen können in Kombination mit wachsendem Nutzungsdruck dazu führen, dass Ökosysteme plötzlich kollabieren oder „umkippen“.