

SALLnet Newsletter, March 2020

Dear SALLnet members,

the number of cases of Covid-19 infection worldwide has continued to rise in recent days. Germany as well as South Africa have therefore implemented measures including travel bans, closure of schools and universities. Our priority is of course the safety of our members and partners. This has a significant effect on our work, since field work campaigns, fellowships, and upcoming events have to be postponed. With regard to this we are in contact with our donors, the PT DLR and the DAAD. So far we have been informed, that – as many other events (see upcoming events) – the SPACES II Midterm Meeting was postponed. The DAAD has already informed us, that they are willing to find flexible solutions for their scholarship holders and applicants. Further information are to be found on the DAAD [website](#).

We will keep you informed. To do so we shall keep our [Website](#) up to date. You can support us in this attempt by inserting changes with regard to your projected field stays into our [Calendar](#). Further information on SALLnet are to be found on our [Google Drive](#). To keep these formats updated and useful for you, please provide us with further project information at any time!

Take care and stay well!

The current issue contains:

[Project Progress](#)

[Upcoming events](#)

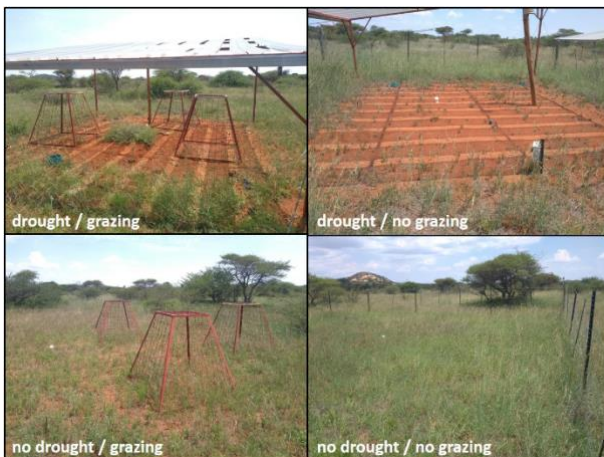
[Media Contributions of SALLnet Members](#)

[Publications of SALLnet Members](#)

[Calls](#)

Project Progress

WP2



Sixth Observation Year in the DroughtAct Experiment: The [DroughtAct Experiment](#) is a large-scale field experiment maintained by SALLnet Workpackage 2 since the year 2013. The experiment addresses two main research questions: (1) What determines rangelands' stability in the face of drought?; and (2) What are suitable management interventions to avoid degradation in the face of drought? The experiment is located at the Experimental Farm of the University of Limpopo, South Africa. It combines resting treatments with treatments of centennial-scale drought. Data collection in the DroughtAct experiment is now in its 6th year. Treatment effects are clearly visible, in particular the effect of a prolonged, severe drought (see figure). Data collection during the current growth period will continue until May 2020.

DAAD fellowships: (1) Vincent Mokoka (PhD student) from the University of Limpopo, South Africa received a DAAD scholarship for an extended stay at the University of Bonn within the [Grassland Ecology & Grassland Management Group](#). His work will focus on the effects of global environmental change on ecosystem stability components and on ecosystem performance.

(2) Katharina Behrendt from the University of Cologne successfully applied for a scholarship within DAAD's PROMOS program. This will grant Katharina the opportunity to conduct research for her bachelor thesis in South Africa's Limpopo Province. Katharina will explore the effects of drought and grazing on functional vegetation composition and diversity, collecting her field data in the [DroughtAct Experiment](#).

WP3



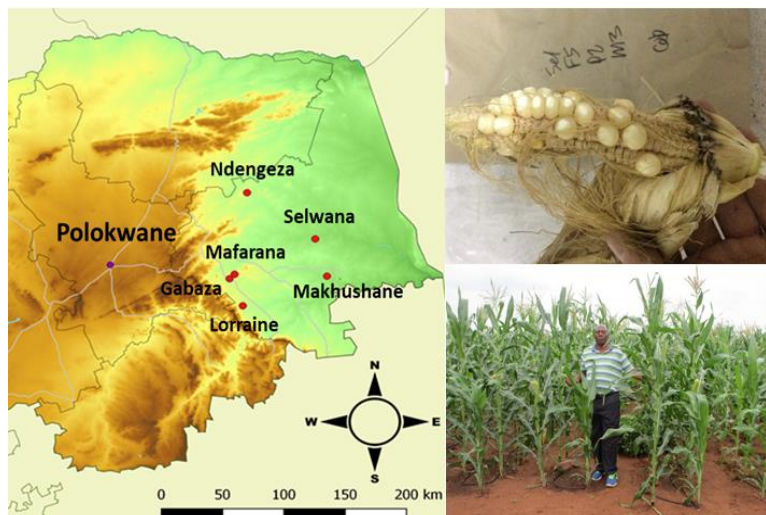
Upcoming field trip (mid-March to end of April): Mina Krieger (PhD student) and Fabian Osten (MSc student, University of Göttingen) travel to South Africa, Louis Trichardt, for macadamia yield analysis together with Dr. Valerie Linden (postdoc at the University of Venda). The provisioning of biological control by bats and birds as well as pollination services by insects were manipulated experimentally during flowering and fruit ripening. Now the yield analysis will show the efficiency of biological control and pollination services in macadamia orchards in South Africa.

DAAD fellowship: Vusani Mphethe (Phd student, University of Venda, Limpopo, South Africa) stays for three months at the division of [Functional Agrobiodiversity at the University of Göttingen](#) with a DAAD scholarship. His work focuses on biological control delivered by bat species in litchi orchards in the Limpopo region.

WP6

Recent work on aDGMV2 has focused on fixing issues related to phenological triggers in the context of ongoing calibration work. Refinement of aDGMV2's rain- and light-triggered phenology has closed loopholes that, undesirably, had led to a preferential selection of light-triggered phenology in water-limited regions, and rain-triggered phenology in light-limited regions. This issue seems to have been resolved. In addition, focus has been on the calibration of coexistence of vegetation types (annual vs. perennial grasses, deciduous vs. evergreen trees, grass-tree-coexistence, shrubs and trees).

WP7



Current WP7 work investigates the extent to which the combination of genotype, drip irrigation, and nitrogen fertilizer can reduce climate-induced risk to sustainable intensifying maize production in the Limpopo region. We use the empirical data collected during the April-May 2019 field campaign to set-up and run the APSIM crop model. Field data collected quantifies soil properties and key management aspects, such as cultivar choice and plant-density, for smallholder farmers across a climate gradient in Limpopo. This simulation study has been run using historical weather data for key sites, and will be tested under future climate scenarios. This work has been presented at the [iCROPm conference](#) in Montpellier, France at the beginning of February.

Ground-truthing of the first maize growing season in villages across a climate gradient is complete – soil samples taken still in the lab:

- Data acquisition finished for: set-up of the APSIM crop model for smallholder management, as well as yield potential. While soil property data existed for some of the villages, the samples taken in 2019, being analyzed in the lab now add to this database. All biomass harvests and soil properties have been geo-referenced.
- Carlotta May completed her MSc thesis (December 2019 defence), which consisted of a household survey of arable smallholder farmers in Limpopo.

For more information of other work packages please visit our [website!](#)

Upcoming events

POSTPONED

3rd Annual WeatherSMART Science-Stakeholder Conference, Pretoria



23-24 March 2020

Thomas Bringhenti's (PhD student of WP 5) abstract "Feasibility of smallholder adaptation strategies to climate change in Limpopo, South Africa" is accepted for oral presentation at the [3rd Annual WeatherSMART Science-Stakeholder Conference](#) in Pretoria. The presentation will be included in the WeatherSMART conference proceedings.

EGU General Assembly 2020, Vienna

POSTPONED



3-8 May 2020

SALLnet findings ([Modelling impacts of climate change and alternative management interventions on the multi-functionality of agricultural landscapes in southern Africa](#)) will be presented at the [EGU General Assembly 2020](#) in Vienna.

SPACES II Midterm Meeting, Future Africa Campus, Pretoria



18-19 May 2020: Early Career Researchers Workshops

20-21 May 2020: SPACES II Midterm Meeting

POSTPONED

SALLnet Training Workshop APSIM Advanced and dynamic vegetation modelling, University of Göttingen



24-28 August 2020

This course will introduce student to the principles and advanced application possibilities of crop simulation models (CSMs) and dynamic vegetation models (DVMs).

Further information please find [here](#).

Deadline for applications: 29 March

Apply now!

SALLnet 2nd Annual Meeting, University of Limpopo

13-18 September 2020

Further information to come soon

Save the date!



Training Workshop in Ecological Field Methods in Limpopo, South Africa

23.-27. November 2020

An international team of SALLnet ecologists will offer a training workshop in state-of-the-art ecological field methods. The course will be jointly organized by members of four universities – the Universities of Bonn and Göttingen in Germany, and the North West University and University of Venda in South Africa. Focusing on grassland and savanna ecosystems in South Africa's Limpopo Province, a wide range of field methods – both from plant ecology and animal ecology – will be introduced and applied in the field, followed by a joint data analysis.

Participants will therefore gain experience in all steps of ecological field research.

Methods include pollinator and flower visitor sampling, herbivory assessments, estimation of biomass production, and sampling of plant functional traits. Many methods used in this workshop are standardized measurements suitable for a Rapid Ecosystem Function Assessment (REFA), which enables a comparison of different study sites. The workshop is intended for MSc and PhD students from South Africa or from other SPACES II countries. German students can be accepted in exceptional cases. A number of funded slots (travel & accommodation) are available for this workshop. Applications will be possible in June 2020 via the SPACES II webpage.

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

Media Contributions of SALLnet Members

Anja Linstädter on Bush-Fires in Australia

SALLnet Principal Investigator Dr. Anja Linstädter (vegetation ecologist at the University of Bonn – [Grassland Ecology & Grassland Management Group](#)) was recently interviewed by the newspaper Bonner General-Anzeiger. On the occasion of severe recent wildfires in Australia, Dr. Linstädter commented on the links between human-induced climate change, extreme ecological events, human disturbance, and joint impact of these factors on ecosystems. She also explained why such natural disaster will become more frequent in many terrestrial ecosystems, including African savannas.

The interview, conducted in German, was published in print as well as online on the website of [General-Anzeiger Bonn](#).



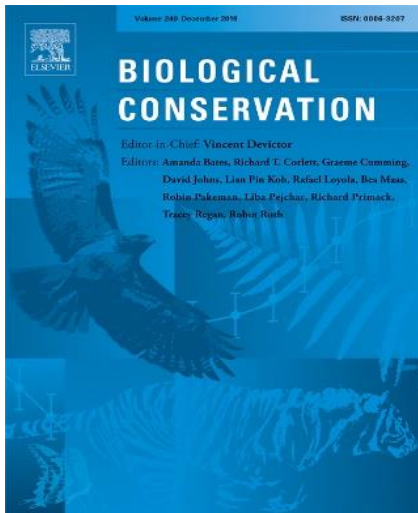


Sina Weier, Valerie Linden and Peter Taylor on Bats versus macadamia crop pests

SALLnet researchers Dr. Sina Weier, Dr. Valerie Linden and Prof. Peter Taylor (University of Venda) would like to share their research on bats in [Quest. Science for South Africa](#), which concludes that “bats appear to be of utmost importance for insect pest control” preventing macadamia crop loss from insect pest damage. “Unfortunately, bat populations keep declining at an alarming rate and about one quarter of all bat species are currently threatened with extinction. This decline is mainly attributed to the loss and fragmentation of habitats, roost sites and feeding opportunities, caused primarily by agricultural intensification – more and more natural areas being turned into farmland.” The authors offer recommendations on how to help promote bat activity and the biocontrol provided by them.

Read [more](#).

Publications of SALLnet members



Kumar D; Pfeiffer M; Gaillard C; Langan L; Martens C; Scheiter S (in press): [Misinterpretation of Asian savannas as degraded forest can mislead management and conservation policy under climate change](#). BIOLOGICAL CONSERVATION.

Abstract: Savannas cover large areas of tropical Asia. Yet, these ecosystems are threatened by intense land-use and governmental afforestation initiatives. They are vulnerable to woody encroachment due to fire suppression and climate change. Despite their ancient origins, Asian savannas have been misinterpreted as degraded forest since the colonial period. The consequences of this misinterpretation and climate change on ecosystem functions and diversity of savannas are highly uncertain. We used a dynamic vegetation model, the aDGVM2 to simulate vegetation state under different climate change scenarios to assess how different interpretations of simulated vegetation influence biome patterns in South Asia. Our results show that large areas in South Asia can be interpreted as woodland or degraded forest if we ignore the grassy component and as savanna if the grassy

component is considered. [...] We conclude that there is an urgent need for a correct interpretation of Asian savannas to allow sustainable management and conservation of biodiversity, which is already strongly threatened due to woody encroachment caused by climate change.



Scheiter S; Moncrieff G R; Pfeiffer M; Higgins SI: [African biomes are most sensitive to changes in CO2 under recent and near-future CO2 conditions](#). Biogeosciences.

Abstract: Current rates of climate and atmospheric change are likely higher than during the last millions of years. Even higher rates of change are projected in CMIP5 climate model ensemble runs for some Representative Concentration Pathway (RCP) scenarios. The speed of ecological processes such as leaf physiology, demography or migration can differ from the speed of changes in environmental conditions. Such mismatches imply lags between the actual vegetation state and the vegetation state expected under prevailing environmental conditions. Here, we used a dynamic vegetation model, the adaptive Dynamic Global Vegetation Model (aDGVM), to study lags between actual and expected vegetation in Africa under a changing atmospheric CO₂ mixing ratio. We hypothesized that lag size increases with a more rapidly changing CO₂ mixing ratio as opposed to slower changes in CO₂ and that disturbance by fire further increases lag size. Our model results confirm these hypotheses, revealing lags between vegetation state and environmental conditions

and enhanced lags in fire-driven systems ...

Calls

- 31 March (Deadline)
[KIT Summer School on Land use and ecosystem change, August 2020, Garmisch-Partenkirchen](#)

SALLnet – South African Limpopo Landscapes Network

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