

Workshop report:

Strategies for ecosystem and species conservation: Exploring lessons learnt from Australia and Africa, Charles Darwin University (CDU), Australia, 18-22 November 2019

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Dr Anke Frank, Zoological Research Museum Alexander Koenig (ZFMK), Bonn, Germany

Prof Dr Kerstin Zander, Northern Institute (NI), Charles Darwin University (CDU), Australia

Background

Considering the ongoing species decline and habitat degradation worldwide, the scientific goal of this workshop was to highlight examples of effective species and ecosystem conservation from Australia and Africa with a particular focus on the shared (sub-)tropical habitat types. Moreover based on the workshop outcomes, we aimed to set the foundations for a joint review paper and to explore funding options for future collaboration. Due to the importance of species and ecosystems for local and indigenous people in many parts of Africa and Australia, we approached the topic from an ecological and socio-economic perspective. This was achieved through the interdisciplinary team of workshop organizers and through cooperation with scientists from the Charles Darwin University (CDU) Northern Institute (NI), which is a regional leader in social and public policy research, the CDU Research Institute for the Environment and Livelihoods (RIEL) and the Darwin Centre for Bushfire Research. In addition, African research partners participated in the workshop via Skype. The workshop was financially supported by the International Cooperation Funds of the University of Bonn, Germany, with the goal to initiate new research collaborations with strategic partner countries and universities.

Workshop activities

The workshop was organized in an open, interactive format to allow for the participation of a large number of CDU-based scientists and conservation managers from Darwin-based government institutions. Our open format included public lectures, discussion sessions, a public seminar and space for informal interaction.

The workshop was launched on 19 November 2019, with a public lecture series and discussion session (see Abstracts and Program in Annex). Prof Grahame Webb opened the floor by providing a global perspective on sustainable use and conservation

of species and ecosystems and by highlighting the work of the IUCN Sustainable Use and Livelihoods Specialist Group (SULi). Next Dr Anke Frank discussed challenges for conservation research in Africa and Australia, followed by talks that gave insights into conservation case studies from the Democratic Republic of Congo (DRC), Ethiopia and Kenya. On 20 November 2019, we held discussions with researchers from NI, RIEL and the Darwin Centre for Bushfire Research, followed by an excursion to Litchfield National Park on 21 November 2019, which highlighted the role of indigenous rangers and communities in ecosystem conservation in Australia. Finally, in the morning of 22 November 2019, we held interdisciplinary discussion sessions on the key issues research topics that had emerged during the previous days. In the afternoon, Dr Frank and Dr Schmitt presented the workshop results at the RIEL research seminar with opportunity for informal discussions over pizza and beer during the social mixer afterwards (Picture 1).



Picture 1: Group photo, RIEL seminar social mixer (Photo credit: Hunter Baggen, CDU)

Back row (from left to right, only scientists): Rifka Sibarani, CDU; Kerstin Zander, CDU; Anke Frank, ZMKF; Christine B. Schmitt, University of Bonn; Holly Sargent, CDU; Louis Martini, CDU; Carla Eisemberg, CDU; Brett Murphy, CDU; Rebecca Rogers, CDU; Will Kemp, CDU

Front row (from left to right): Bruno Buzatto, Macquarie University Sydney; Osmar Luiz, CDU; Sam Banks, CDU; Stephen Garnett, CDU; Hamish Campbell, CDU; Tara Crewe, CDU; April Reside, University of Queensland; Amy Kate Kirke, CDU

Outcomes

The workshop highlighted four research clusters that are of importance in both the African and the Australian context and that complement ongoing research activities at the University of Bonn and CDU:

1. Ecosystem management and climate change mitigation, esp. fire management in wooded grassland ecosystems
2. Sustainable use of species and ecosystems, including indigenous knowledge, community-based resource management and payments for ecosystem services
3. Human-wildlife conflicts in the conservation context
4. Public perception of conservation issues and the role of awareness raising campaigns and environmental education

In terms of funding opportunities, we identified separate funding options for the Australian and German research institutions such as the Australian Research Council (ARC), and the German Research Foundation (DFG) respectively. Funding for African partners would have to come from Germany since ARC mainly funds research in Australia and Southeast Asia, unless the project is applied and could be supported by the Australian Government's development policy Australian Aid. The German Academic Exchange Service (DAAD) Australia-Germany Joint Research Co-operation Scheme only covers travel costs but does not include salaries. Finally, there are funding opportunities for individual students and researchers with the Alexander von Humboldt Foundation and the DAAD.

Future plans

We aim to maintain and enhance collaboration between the University of Bonn and CDU through a joint review paper that will cover one of the identified research clusters. Moreover, Dr Schmitt will consult with the International Office of the University of Bonn on how to realize a joint German-Australian project proposal. In addition, we will promote student exchange and the joint supervision of doctoral students, which will benefit from Prof Zander's stay at Bonn in 2020 within the framework of her Alexander von Humboldt Fellowship.

Annex

Abstracts of talks given on 19 November 2019

Sustainable Use: What, Where and Why?

Grahame Webb, Charles Darwin University (CDU) / Wildlife Management International (WMI), Australia

The conservation of wild plants and animals has to proceed in local areas, in the real world, where the integration of biological, social and economic variables already exists in context-specific ways. There is no Utopian landscape, in which the roles of plants, animals and people can be created and shaped, for the first time, to meet ideological paradigms of distant people in distant lands. Pursuing conservation involves “Act-Assess-Adapt” - in the field - rather than “Assess-Plan-Act”, more suited to desktop deliberations postponing conservation action. Sustaining uses is essential to biodiversity conservation, and consistent with the UN Sustainable Development Goals - the humanitarian umbrella under which conservation action proceeds. This is accepted by the CBD, CITES, CMS, IUCN and UNEP. The IUCN Sustainable Use and Livelihoods Specialist Group (SULi) has assembled many case histories of highly successful programs where uses are sustainable, conservation is advanced and livelihoods are improved. The case of saltwater crocodiles in the Northern Territory of Australia is a compelling case history. Saltwater crocodiles are a serious predator on people. Reduced to 1% of former biomass by pest eradication and hunting for skins between 1945 and 1971, the population is now (2019) completely recovered. This is a 20 times increase in abundance and 100 times increase in biomass. A commercial ranching program, allowing landowners to sell eggs to farms, created the incentives needed to tolerate the increasing numbers of crocodiles. The program is a conservation success, it benefits Aboriginal people who own most wetlands, and has changed the public perception of crocodiles from a liability to an asset. There are many other diverse case histories where conservation through sustainable use can be clearly demonstrated. Indeed, as with crocodiles, the species that have a commercial value no longer have a conservation problem. Those without a commercial value are the ones where declines are ongoing.

Challenges for conservation research – examples from Australia and South Africa

Anke Frank, Zoological Research Museum Alexander Koenig (ZMFK), Bonn, Germany

Conservation research is challenging at global level. Reasons for this are, amongst many others, a focus of most politicians on improving economies at the demise of biodiversity protection and many people's trust in future technologies tackling all biodiversity and climate change problems. Despite differences in size, topography, population size as well as animal and plant species composition, Australia and Africa share many conservation research challenges, which are strongly linked to general threats to biodiversity. However, there are also challenges for conservation research, which play a big role in Africa but no or only a minor role in Australia and vice versa. For example, lack of law enforcement, political instability, crime and corruption are likely to pose a greater challenge to conduct fieldwork in Africa than Australia. Contrary, in Australia, conservation research is more expensive and research funding

from other countries often difficult to get, as it is a rich developed nation and through media rather a country known for its spectacular biodiversity rather than one with species loss issues. A summary of these conservation research challenges was provided to spark interest in collaborative approaches to tackle the challenges for conservation research, e.g.: "Would it be possible to identify where which type of research would be most efficient to conduct?", or "Could exchange of experts experiencing a shared conservation issue help in tackling it?"

Economic valuation of primary forests to support conservation in the Democratic Republic of Congo (DRC): spatial and sociodemographic perspectives

Fitalew A. Taye, Griffith University, Australia

Avoided deforestation on unprotected forestlands often means imposing restrictions on the use of forest resources by households that currently use them to maintain their livelihoods. Implicit but often unrecognized in forest management strategies is that communities are not homogeneous, implying an important degree of variation in the costs of forest use restrictions across households. Under conditions of local subsistence use, a key factor in planning for effective impact in design of a forest management program, is assessing the minimum compensation necessary to incentivize forest conservation. This study presents an empirical evidence on the divergence of different value measures for two pilot study sites under different forest use practices in the Democratic Republic of Congo. A market price study on environmental and household incomes was administered alongside a contingent valuation (CV) survey, in which respondents were asked to state their minimum level of compensation required to forgo access to timber and non-timber forest products from their local protected area for a period of one year. Data were collected from households in areas adjacent to the forests according to a stratified random sample ($n=360$). The regression analysis provides valuable insights on the determinants of the amount of compensation required for forest conservation efforts. In general, household characteristics e.g. ethnicity of the respondent, perception and experience in forest use, and social capital indicators were identified as important variables.

Balancing human uses and nature conservation in East African forest biodiversity hotspots

Christine B. Schmitt, Center for Development Research (ZEF), University of Bonn, Germany

The Eastern Afromontane Biodiversity Hotspot covers a range of biogeographically related mountain areas from the Arabian Peninsula to Mozambique and Zimbabwe. It is recognized globally for its exceptional species diversity threatened by high human land use pressure. This talk focuses on the moist montane forests of Ethiopia and Kenya to highlight the effects of human management interventions on plant diversity and discuss conservation implications. The Ethiopian moist montane forests are the center of genetic diversity of Arabica coffee that grows wild in the forest understory. Plot based vegetation surveys showed that there is high regional variation in plant diversity within the Ethiopian wild coffee forests. Whereas wild coffee is the main source of income for local farmers, the related management interventions lead to a change in forest structure and loss of characteristic forest species. Recently, three UNESCO Biosphere reserves have been established that aim at reconciling strict

protection of wild coffee forest biodiversity in core areas with sustainable forest use and economic development in buffer and transition areas. In the Taita Hills of southeastern Kenya only a small fraction of the original moist montane forest cover remains. The surrounding agricultural areas are dominated by exotic tree species, mainly Grevillea and Eucalyptus, with negative impact on ecosystem quality. Interview surveys showed that enhanced communication and collaboration between governmental and community organizations is required to clarify forest use rights and benefit-sharing. Insights from both case study countries highlight that conservation measures must take into account the particular cultural and socioeconomic circumstances in each area. In particular, close cooperation with local farmers and forest user associations is required to develop management solutions that consider biodiversity goals and livelihood perspectives.

Habitat restoration efforts for two critically endangered, endemic birds in the Taita Hills cloud forests of Kenya

Lawrence Wagura, Luca Borghesio and Mwangi Githiru, National Museums of Kenya, Kenya

The Taita Hills, an isolated mountain block rising up to 2,200m above the surrounding dry plains in southeastern Kenya, is part of the Eastern Afromontane Biodiversity Hotspot. Taita Hills has lost c. 98% of its original forest over the last 200 years to human settlements and forest degradation. The remaining forest is confined in 12 patches that are extremely fragmented – all located on hilltops and steep slopes and with a combined total size of about 500ha only. Despite the loss, the Taita Hills continue to support unique biota, many of them endemic to the area. This is however with a lot of pressure as currently, the Taita Hills hold the highest concentration of threatened endemic species in Kenya. Our research revealed that two critically endangered, endemic birds, Taita apalis (*Apalis fuscigularis*) and Taita thrush (*Turdus helleri*) are threatened with near future extinction with only c. 150 individuals for *A. fuscigularis* and c. 1500 individuals for *T. helleri* making the global population.

Since 2014, in collaboration with other partners, we have focused our conservation efforts in protecting and improving the cloud forest habitat as well as enhancing connectivity for these threatened endemic species. The science-driven multi-tactic approach involves eradication of invasive/exotic species, land lease and purchase, policy and advocacy, awareness raising and research to understand the drivers of population trends for *A. fuscigularis* and *T. helleri*. Our concerted efforts in a span of five years, have achieved a conversion of a 8ha of exotic/invasive species patch into natural vegetation, a 25-years land lease of 6.1ha and a land purchase of 3.3ha, all capable of providing habitats for c. 35 pairs of *A. fuscigularis*. More efforts are being put in eradication of exotic species that would see a targeted restoration of an additional c. 200ha. More efforts are also being put in land purchase, which target an additional 21ha to expand habitats and create an important habitat corridor between two fragments. However, land purchase is faced with challenges due to high land value and unwillingness to sell by many land owners.

Our restoration work has demonstrated a cost-effective approach and quick recovery of low natural vegetation, which forms the ideal habitat for one of the target species. We demonstrate the local-scale preparations required prior to scaling up restoration efforts, which in the long-term will protect Taita's unique biodiversity and provide water security and climate change mitigation to the local communities.

Nature conservation, culture and livelihoods in Ethiopia

Girma Kelboro, Center for Development Research (ZEF), University of Bonn,
Germany

Ethiopia is one of the biodiversity-rich countries of the world. However, the country's ecosystems suffer from degradation primarily due to habitat conversion and unsustainable utilization of natural resources. Drawing on fieldwork conducted in Nech Sar National Park in Southern Ethiopia, this paper shows that insufficient consideration of local livelihood needs and land-use patterns constitute major underlying reasons for the limited effectiveness of the National Park. We collected data through household interviews, expert interviews, focus group discussions and participatory mapping. The findings uncover that there is a mismatch between a top-down, state-initiated conservation approach and local culture and livelihood needs, conditions to be found in many National Parks in sub-Saharan Africa. We conclude that the situation in Nech Sar National Park calls for integrated land-use planning approaches based on transdisciplinary research and involvement of all stakeholders beyond the rhetoric of participation.



Strategies for ecosystem and species conservation: Exploring lessons learnt from Australia and Africa

Public presentations

19 November 2019

Mangrove Room, Northern Institute, Charles Darwin University (CDU)

09:00-09:10 **Introductory note** *Christine B. Schmitt*, University of Bonn

09:10-09:50 **Sustainable Use: What, Where and Why?** *Grahame Webb*, CDU and Wildlife Management International (WMI)

09:50-10:30 **Challenges for conservation research – examples from Australia and South Africa** *Anke Frank*, Zoological Research Museum Koenig, Bonn

10:30-11:00 **Tea break**

11:00-11:40 **Economic valuation of primary forests to support conservation in the DRC: spatial and sociodemographic perspectives**
Fitalew A. Taye, Griffith University

11:40-12:20 **Balancing human uses and nature conservation in East African forest biodiversity hotspots** *Christine B. Schmitt*, University of Bonn

12:30-13:30 **Lunch** (finger food)

13:30-15:00 **Open discussion session**

15:20-16:00 **Management and conservation approaches in the Tsavo savanna and Taita forest ecosystems in Kenya** *Lawrence Wagura and Mwangi Githiru*, National Museums of Kenya

16:00-16:40 **Nature conservation, culture and livelihoods in Ethiopia**
Girma Kelboro, University of Bonn

16:40-17:00 **Closing remarks**

This public event features presentations on ecosystem and species conservation in Australia and Africa with a particular focus on the shared (sub-) tropical habitat types. We invite participants to an open discussion session that will set the foundations for a joint review paper and explore funding options for future collaboration. The event is financially supported by the International Cooperation Funds of the University of Bonn, Germany, with the goal to initiate new research collaborations with strategic partner countries and Universities. For further information, please contact Christine Schmitt: cschmitt@uni-bonn.de.

Presenters



Prof. Grahame Webb

Grahame is one of the world's leading authorities on crocodile research and management. He demonstrated how conservation and farming can succeed side by side and helped crocodile populations to recover. Grahame's unique vision for conservation based on sustainable use drove him to establish his own wildlife management and research consulting company in 1978, before opening Darwin's crocodile research and education centre, Crocodylus Park, in 1994. Overall, Grahame has created a new conservation model that provides a future for a species and an economic future for local communities.



Dr. Anke Frank

Anke is a terrestrial ecologist at the Zoological Research Museum Alexander Koenig, Leibniz-Institute for Animal Biodiversity, Bonn, Germany. Her main research focus is to better understand trophic and biotic-abiotic interactions and to determine the key top-down and bottom-up processes that drive ecosystem functioning processes as well as potential species extinctions. She has over a decade of research experience in Australia, mostly in arid and savanna ecosystems, and also investigated some of these processes in South Africa, Argentina and Brazil.



Dr. Fitalew A. Taye

Fitalew is a postdoctoral research fellow at Griffith Business School, Griffith University, Australia. Currently, he is conducting research on tropical primary forest protection under the Griffith Climate Change Response Program. He received his PhD in Environmental and Resource Economics at the University of Copenhagen, Denmark. His research focuses on the economic valuation of forest ecosystem services, primary forest protection, and rural community livelihoods. He is enthusiastic to quantitative research, especially in analysis of preferences using the discrete choice modelling.



PD. Dr. Christine B. Schmitt

Christine is a Landscape Ecologist and Senior researcher at the Center for Development Research (ZEF), University of Bonn, Germany. Her research has a focus on biodiversity patterns, biodiversity conservation and landscape management, in particular in the tropical regions of the world. Christine has long-term research experience in Africa where she conducted field investigations of plant diversity and human uses, e.g., in Ethiopia and Kenya, in collaboration with local Universities, government agencies, NGOs, and other partners.



Dr. Mwangi Githiru, Kenya

Githiru is the Director of Biodiversity and Social Monitoring at Wildlife Works, leading teams assessing environmental and social impacts of REDD+ projects in Africa, Asia and Latin America. He also heads up Environment, Social and Governance (ESG) for the company. He previously worked for the Kenya Government at the Ministry of Science and Technology. Though trained in ecology, he is mostly interested with issues at the intersection of science-policy-conservation-economics, spanning Government and non-governmental sectors, with a focus on the private sector.



Mr. Lawrence Wagura

Wagura is a naturalist with wide ranging skills and knowledge in Kenya natural history. He has a niche in taxonomy, ecological research, conservation and in interpreting nature to variety of audience in the society. Wagura is passionate in influencing practical changes that guarantee planetary wellbeing. He is the founder and director of Natural Africa Concern, an NGO that focuses on conservation oriented Research, Conservation of critical natural habitats, as well as community development and awareness.



Dr. Girma Kelboro

Girma is a Senior researcher at the Center for Development Research (ZEF), University of Bonn. His scientific field of expertise is agro-sociology with a PhD degree in agriculture specializing in the social dimension of natural resource management and farming. His research interests are agricultural and rural development governance, institutions, innovation and knowledge in smallholder agriculture, biodiversity conservation, livelihoods, renewable energy and sustainability. He currently coordinates the project "Climate Information to Support Integrated Renewable Electricity Generation in West Africa."