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The Afromontane Research Unit—Growing as a Hub of Transdisciplinary Research



The Afromontane Research Unit (ARU) at the University of the Free State's Qwaqwa campus in South Africa has a steadily growing reputation as a leading research unit on sustainable development in Afromontane regions. Learning from international experts, researchers in this unit have focused on multi- and transdisciplinary scientific approaches to the challenges faced by montane communities. The ARU is therefore strongly attuned to the global research focus on complex systems approaches, as it acknowledges that the Sustainable Development Goals cannot be reached by a “business as usual” approach.

In October 2017, the International Council for Science and the International Social Science Council voted to merge, launching the International Science Council in 2018 (ICSU 2017). This historic meeting thereby officially endorsed the importance of crossing academic boundaries to conduct multi- and transdisciplinary research addressing problems of global importance. This merger of the globe's leading scientific bodies recognizes the transdisciplinary nature of the United Nation's Sustainable Development Goals and heralds an era in which the practice of scientific research is fundamentally changing. Against this backdrop, the Afromontane Research Unit (ARU) finds itself at the forefront of montane research, despite its relative youth. Launched in June 2015 (Mukwada et al 2016), the ARU investigates sustainable development in Afromontane regions, currently hosting 20 researchers, 4 postdoctoral fellows, and 23 postgraduate students at the rural Qwaqwa campus of the University of the Free State in South Africa. Its research, spanning 4 faculties and 7 departments, addresses multiple aspects of the complex topic of sustainable development, as it

focuses on questions that affect the wellbeing of isolated montane communities (Box 1).

Building international connections

One of the highlights of the ARU's short tenure was the first ARU

colloquium, held in November 2016 in Golden Gate Highlands National Park. The purpose of this colloquium was to showcase the research conducted at the Unit, while also bringing local researchers and students (Figure 1) together with international experts in multifaceted montane research. The keynote

BOX 1: Prominent projects of the Afromontane Research Unit

Fire risk zones—Using remote sensing techniques, the ARU is mapping the past, present, and projected future patterns of wildfire in the mountains of Golden Gate Highlands National Park. The goal is to inform fire management in the park as well as the disaster management strategies of local municipalities.

Water resources—This research consists of an ecotoxicological and bacteriological assessment of water resources in the Afromontane region and an investigation of the use of biochar to treat polluted sludge from wastewater treatment facilities.

Visual cultures—This qualitative research project deploys theories of visual culture to critically analyze visual representations of the Afromontane region, particularly in the Maluti area of the eastern Free State and Lesotho. Analyzing a wide array of images, architecture, and other visual elements, this study investigates the ways in which local communities have responded to their immediate landscape, and the influence on that response of social values, consumerism, religion, and other forces.

Value chains—The ARU is studying natural resource use by local communities in the area where the proposed new Witsieshoek Community Conservation Area would be located, in an effort to identify the value chains that characterize this montane environment and the ways these chains could be incorporated into conservation and tourism planning.

Migration patterns—This far-reaching project interrogates the intersections of migration and sustainable development in mountain societies. It is particularly important to the Qwaqwa region, because the local community's composition has been strongly affected by apartheid-era policies and the outmigration of family breadwinners in a region that has historically had limited job opportunities and resources.

Human-wildlife interactions—This interdisciplinary project aims to document urban wildlife and the relationship between peri-urban/rural communities and wildlife in the montane socioecological system of Qwaqwa. Focused on community engagement, it assesses how citizen science can be used to reconnect an urbanizing African community to nature.

FIGURE 1 The future of Afromontane research: postgraduate students presenting papers and posters at the first Afromontane Research Unit colloquium. From left to right: Teboho Mofokeng, Mamosa Ngcala, Portia Mosolloane, Makatleho Tsotetsi, Ngitheni Nyoka, Dineo Modise, and Tiisetso Mopeli. (Photo courtesy of the University of the Free State)



speakers were of a high caliber, spanning a variety of disciplines. Prof Greg Greenwood, then executive director of the Mountain Research Initiative, gave the keynote address for the colloquium as a whole, speaking about his own experience in sustainable montane development. Other keynote speakers were Dr Henri Rueff, a geographer and environmental economist from the University of Basel (Switzerland), who studies the livelihoods of smallholders in isolated, resource-scarce mountain and desert communities; Prof Jianchu Xu, an internationally renowned ethno-ecologist who studies coupled human-environment systems at the Center for Biodiversity and Indigenous Knowledge (China); and Dr Reetu Sogani, from the Chintan International Trust (India), who has

worked extensively on participatory and gender-inclusive climate-resilient livelihoods for marginalized communities in the Himalayas. The colloquium was an undeniable success, not only engendering several new international and local collaborations, but also providing much-needed insights on how to structure and develop such a multidisciplinary research unit.

Advisory board members and attendees of the colloquium all expressed the realization that the ARU has certain unique potentials, centered on its location in the heart of an important Afromontane region, and the ease with which researchers from distinct disciplines are able to collaborate on this small campus. In the absence of a long-established research culture or prominent

trappings from the colonial era, the campus boasts a vital flexibility and energy that can indeed drive socially relevant research.

Meeting the challenges of transdisciplinary research

It is widely acknowledged that multi- and transdisciplinary research is challenging, and community buy-in to the scientific process can be difficult to achieve. The ARU therefore organized a seminar series led by Prof Courtney Flint from the University of Utah, a sociologist with extensive experience in conducting research that crosses academic and societal barriers. In this seminar series and a related workshop, under the theme Enhancing Interdisciplinary Research,

participants grappled with the complexities of breaking down disciplinary barriers. The event was attended by not only academics but government representatives, local industry leaders, and members of the Bakoena Royal House as well. This strategic event, held in July 2017, stimulated discussions rarely seen in discipline-constrained scientific research and was a positive step toward creation of a research unit that engages the community it should be serving. Prof Flint had high praise for the process through which the ARU is growing; he said, “The ARU is charting an innovative course by approaching mountain research and learning through engaging with regional stakeholders. The Seminar was a terrific success at bringing together people who might not otherwise interact. Sharing ideas and learning to think together are first steps toward working together in inter- and transdisciplinary research efforts.”

The ARU has had a significant impact on the research climate on the University of the Free State’s rural Qwaqwa campus, growing from 4 research projects in 2015, mostly in the natural sciences, to a current multidisciplinary portfolio of 14 projects. Some high-profile research

has been published already, most notably a recent paper in *Scientific Reports* (Manatsa and Mukwada 2017) that is expected to cause a paradigm shift on the relationship between drought occurrence and preparedness. The ARU is becoming increasingly visible as a transdisciplinary research unit—for example, through the hosting of a symposium on Science for Society in July 2017, led by Aliza le Roux, at the Zoological Society of Southern Africa’s joint conference with the Entomological Society of Southern Africa. Within the ARU, most research projects include international collaborators, enhancing the ARU’s visibility and expertise. Six additional projects are being evaluated for 2018. A significant proportion of these are explicitly transdisciplinary, ranging from a project on urban wildlife and science education to one on environmental chemistry that could significantly impact local agricultural practices. Under the leadership of its new director, Dr Ralph Clark, the ARU intends to continue linking science with society, as it enhances research and sustainability in African mountain communities.

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