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The Afromontane Research Unit (ARU) in South Africa

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AFROMONTANE RESEARCH UNIT (ARU)

Tucked in the foothills of the Maluti-Drakensberg Mountains is the Qwaqwa campus of the University of the Free State. This is the home of the Afromontane Research Unit, a multidisciplinary flagship unit addressing a largely under-researched area in South Africa.

The founding of the Afromontane Research Unit

The Afromontane Research Unit (ARU) was initiated in 2012 as part of the University of the Free State's 2012–2016 strategic plan to promote excellence in teaching and research within the institution. It was officially launched in 2015, with the goal of advancing montane research in an environment where relatively little research has been undertaken until now, focusing on enhancing interest and building capacity in multidisciplinary research. The ARU comprises academic staff, postdoctoral research fellows, and postgraduate students from different backgrounds, spanning 4 faculties—Humanities, Education, Economic and Management Sciences, and Natural and Agricultural Sciences.

The establishment of the ARU was influenced by important global developments, including the 2002 World Summit on Sustainable Development and the 2012 Rio+20 United Nations Conference on Sustainable Development, and in particular the call for greater efforts to conserve mountain ecosystems in the United Nations General Assembly (2012) resolution *The Future We Want*.

Our focus—addressing real issues facing montane communities

The ARU thus endeavors to promote research contributing to sustainable mountain development, with a research area that covers more than 600 km of mountain range in South Africa and Lesotho (see Figure 1).

Understanding montane issues is critically important to meeting human needs in this rural region where poverty is rife. More than 50% of the population is unemployed; unemployment among the youth hovers around 53%. The majority of the communities in the region directly rely on natural resources for their livelihoods. These communities are generally disadvantaged and prone to challenges associated with food insecurity, material poverty, and other forms of deprivation. The majority of their residents are exposed to poor living conditions characterized by undernourishment and a lack of adequate shelter and potable water.

The ecosystems within the Maluti-Drakensberg area remain a critical aspect of socioeconomic development. The Drakensberg montane grassland, woodland, and forest ecoregion (Figure 2). lies at the center of southern Africa's Afromontane region. The World Wildlife Fund's Global 200 project described it as the "southernmost point of the Afromontane regional center of endemism, [supporting] endemic plants, amphibians, birds and reptiles" (WWF 2012). The region includes more than 2500 species of flowering plants, about 13% of which are endemic. Some researchers have compared the highest portions of this ecoregion to the Alpine tundra (Killick 1997).

Dubbed the "water factories of the region" due to their higher precipitation and the prevalence of wetlands, the Maluti-Drakensberg area is the most important water catchment for both South Africa and Lesotho. Two schemes that were developed to transfer water to drier parts of the region, the Tugela Vaal Scheme and the Lesotho Highlands Water Project, are among the largest civil engineering projects in southern Africa. They and other development projects in mining, agriculture, and tourism have transformed the natural environment in many ways, with serious implications for the sustainability of montane ecosystems.

Socioeconomically, mountains are complex phenomena, with features that provide scope for a wide range of livelihood opportunities that have hitherto not been investigated. Yet they are also fragile, vulnerable to environmental changes, and prone to degradation. This raises questions about the resilience of these ecosystems and the livelihoods that depend on them. There is a need to identify models that are most suitable for investing in upland resource conservation in a manner that is compatible with local ethnocultural values to ensure sustainability. These mountain environments are changing rapidly due to both natural and anthropogenic forces, the latter intensifying as demands for water, food, and hydroelectric power increase.

Our research agenda

To address these complexities, the ARU has streamlined its research into 3 distinct but overlapping themes.

Conservation and sustainable use of Afromontane biodiversity

The natural environment of the study area has many important features: high yet sensitive biodiversity, high species richness, important high-altitude wetlands that supply water to rivers important in the lowlands, protected areas, and national parks. Montane regions in Africa, such as the montane forests in South Africa and the Alpine grass meadows of the Ethiopian Highlands, often represent the last vestiges of fast-vanishing African ecosystems (Figure 2). Not only are these areas biologically

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FIGURE 1 Afromontane Research Unit study area. (Map by Geoffrey Mukwada)



unique, but they have significant yet poorly studied impacts on the more densely populated low-lying regions. This research theme includes studies on biodiversity, ecosystem goods and services and the "green economy," climate change and natural hazards, and land use and catchment management.

Living and doing business in Afromontane environments

The characteristics of high-altitude environments, and of the communities that call them home, mean that development requires mountain-specific strategies, based on mountain-specific research and knowledge. In the past, however, governments tended to concentrate development planning and service provision in lowland areas, traditionally centers for national economic production, leaving poverty and development issues in mountain regions relatively unaddressed. Those living in mountainous areas are often particularly disadvantaged and vulnerable to food insecurity and poor in economic terms, and their livelihood systems often combine a variety of activities, ranging from commercial farming to informal trade. The relatively permeable border between South Africa and Lesotho further complicates this picture. Tourism has considerable potential to improve community wellbeing but brings with it environmental and social impacts. The impacts of climate change will need to be mitigated and new forms of livelihood developed that are less vulnerable to environmental risks. Studies in this theme include food security and nutrition, Afromontane economies, sustainable tourism, rural development and connectivity, and social-ecological systems.

Sustainable futures for the people of the Afromontane communities

The ARU's third research theme addresses critical issues of sustainability. In spite of the obvious importance of mountain areas, the issue of sustainable futures for the people in Afromontane communities does not receive the priority and attention it deserves. The voices of the people living in these remote and often harsh environments are seldom heard, their knowledge is underappreciated, and their needs are barely addressed in broader national development strategies. The environment in which they live requires adaptive and differentiated processes, often to be found in their indigenous knowledge and practices. The area has significant and often entrenched cultural and historical heritage and diversity; however, this is at risk from rapid social and cultural change, including population pressure, migration, and the proliferation of urban and global values. Buoyed by United Nations' Sustainable Development Goals (Osborn et al 2015), the research agenda in this theme ponders culturally and contextually responsive education; culture, heritage, and language; and gender, vulnerabilities, resilience, and sustainability.

Moving forward

Our recognition of the complex nature of mountains has played a significant role in the partnerships and networks that we are building within southern Africa, on the African

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FIGURE 2 Complex geological and floristic formations in the Maluti-Drakensberg Mountains. (Photo by Geoffrey Mukwada)



continent, and across the globe. In these initial stages, we realize the importance of learning from others who have walked this road already. The appointment of the ARU Advisory Board has been an important step in this regard. This broad-based committee is comprised of academics, research leaders, and policy-makers from 5 continents.

As our research program continues to grow, we have recognized the need to showcase the ARU, bring together a range of international and national scholars active in montane research, and allow South African researchers a greater opportunity to obtain a global perspective on current montane research. The first ARU Colloquium will be held at the Golden Gate Highlands National Park from 16 to 17 November 2016 (www.ufsafromontane.org).

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