

Climate change and adaptive land management in southern Africa

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Assessments
Changes
Challenges
and Solutions

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Assessments, changes, challenges, and solutions

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Development of a regional masters programme on dryland forestry

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Dryland forest resources have immense socioeconomic and ecological importance in southern Africa. These forests support the livelihood of growing populations and constitute an important buffer against climate change. However, there is currently a lack of capacity with respect to forestry professionals with sufficient expertise to implement adaptive resource management strategies in the face of climate change. To address this need, Stellenbosch University, in collaboration with other southern African forest scientists, developed a master's programme for dryland forestry (SASSCAL Task 079). It was decided to aim for a research-based MSc in Forestry (i.e., a programme based on the production of an MSc thesis) that would be supported by a number of elective short courses or modules. The elective coursework is designed to equip the student with additional research tools and the requisite knowledge to do independent research in the chosen field of study (<http://www.sun.ac.za/english/faculty/agri/forestry/programmes/postgraduate>). Dryland forestry touches on a wide variety of disciplines, and therefore, the elective short courses depend on the chosen specialisation of the candidate. The scope of the elective short courses was developed during workshops at Windhoek and Stellenbosch, and covers the following topics:

- Woodland ecology and silviculture
- Remote sensing and forest mensuration
- Tree improvement and nursery practice
- Biomass harvesting and transport logistics
- Wood processing and anatomy
- Dryland forest economics

The qualification is offered by Stellenbosch University and can accommodate both full-time and part-time students.



Figure 1: Allometric studies conducted by MSc graduate Martin Kambayi to determine carbon sequestration in the *Cryptocarpalum* forest, Northwest Zambia. (Photo: M Kambayi)



Figure 2: PhD student Werner Mbongo inspects thinning of *Pterocarpus angolensis* at Okongo community forest, Namibia. (Photo: B du Toit)

Graduates and studies in process

The MSc forestry programme with dryland specialisation has attracted several students, working on diverse issues. The following topics have been studied since 2013 (student names and graduation dates in brackets).

1. Impact of fuelwood quality and quantity on rural households' energy use in Omusati region in the northwest of Namibia. (Hainduwa, F.N., 2013).
2. Assessment of trade-offs between timber and carbon values of *Pterocarpus angolensis* (Kiaat) in the Kavango region of Namibia: A comparison of current and potential values. (Moses, M., 2013).
3. Biomass modelling of selected drought-tolerant eucalypt species in South Africa. (Phiri, D., 2013).
4. Natural regeneration potential of *Pterocarpus angolensis* (Kiaat tree) in the dry forests of northern Namibia. (Kayofa, F., 2015).
5. Harvesting and postharvest handling practices of *Strychnos cocculoides* fruits in the Kavango West region of Namibia. (Elago, S.N., 2017).
6. Non-timber forest products in Zambia: Forest honey. (Nyawali, B., 2017)*.
7. Estimating carbon sequestered in an undisturbed *Cryptosepalum* forest in Mwinilunga District of North-Western Province, Zambia. (Kambayi, M., 2017)*.
8. The impact of fire on the natural regeneration of woody miombo species along a rainfall gradient. (Mwanza, P., 2018).
9. A study of the potential for *Eucalyptus* hybrids in farm forestry in the semi-arid winter rainfall region of South Africa. (Lambrechts, H.A., in process)*.
10. Post-harvesting carbon dynamics of cut stumps and root systems in industrial plantations. (Stephan, J.H.J., in process)*.
11. Estimation of below-ground carbon sequestration in eucalypt coppice stumps on a climate gradient. (Van Heerden, B., in process)*.
12. Effects of thinning intensity on the growth regeneration of *Burkea africana* and *Pterocarpus angolensis* in the Zambebian-Baikiaea woodlands. (Mbongo, W., PhD study in process)*.

* Students supported by Task 079 are indicated with an asterisk; the rest were/are funded externally, or by other SASSCAL Tasks).