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Postdoctoral researcher position at Stellenbosch University (South Africa)

Impact assessment of invasive trees clearing in South Africa

The position in a nutshell

This position is a unique opportunity to contribute to the intense discussions around the means to control / eradicate invasive alien species in South Africa and particularly the risks and opportunities associated with the development of value-added industries that process their biomass. Besides, the position is co-hosted by the Stellenbosch University Water Institute (SUWI) and the School for Climate Studies ("the School") at Stellenbosch University, located in the vicinity of Cape Town, South Africa. The postdoc will be able to have an impact on the framing of policies and investments in the fields of the emerging bioeconomy and policies around the control and use of invasive trees with the possibility to work in close interaction with experienced scientists in the field (including the Center for Invasion Biology now part of the School).

Institutional background for the postdoc position and the supervising team

This postdoc position will be funded by the Horizon Europe project MarginUp! that aims at raising the bio-based industrial feedstock capacity of marginal lands. This project has activities in South Africa under the responsibility of Stellenbosch University (SU):

- SU is one of South Africa's leading tertiary institutions, with a vibrant cohort of students and highly rated scientists. The University currently has the highest weighted research output per full-time academic staff member of all South African universities.
- SUWI is a multidisciplinary research collective that recognises the complex nature of water management and supply in a water-scarce country such as South Africa. Drawing from the expertise

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of leading researchers from almost all faculties at SU, the SUWI offers an ideal environment for students and young water professionals to get involved in projects funded by government, industry and international funding agencies, to conduct studies and research aimed at solving our industry and public partners' problems.

- Leading the field in the move towards a carbon-neutral university, SU launched the School in 2021. This is the first school of its kind in South Africa and aims to create transdisciplinary capacity to combine the climate-related knowledge systems of our faculties, the public sector's climate policies and initiatives, the private sector's climate redress and innovation capacities and the social impact mission of SU in both academic and applied ways – all in support of the transition to a climate-resilient society and a sustainable, low-carbon economy.
- The postdoc will be recruited and co-supervised by SUWI and the School; they will report to Dr Romain Pirard who will be the focal point to coordinate the research by the postdoc.

Description of the postdoc and expectations

There is an intense debate about the means of controlling invasive alien trees and particularly regarding the role that value-added industries could play. While they are seen as potential additional resources to increase land clearing activities in infested areas and contribute to reducing the intensity of propagation, their opponents point to a risk of aggravation of the problem due to poor harvesting techniques and conflicting interests with the reduction of the accessible biomass.

This debate is extremely important for at least three reasons: (i) the energy transition in South Africa is about to reach full speed and bioenergy could contribute to the energy mix using the vast biomass resources from infested areas, (ii) resources available for land clearing and restoration operations are an order of magnitude lower than necessary to control effectively the propagation of invasive trees so that private investments would possibly be a game changer, and (iii) soil-enhancement products such as biochar, activated carbon and others would contribute to a climate-resilient agriculture and carbon dioxide removal. As there is a lack of robust impact assessment of these value-added industries, we propose to fill this gap and provide scientific evidence to nourish future decisions by both policymakers and private investors.

The postdoc will conduct the following activities:

- Design a research protocol for an impact assessment of supply chains for biomass from the main invasive trees taxa (pines, acacias and eucalyptus) on land condition, provision of environmental services and control of invasive trees. This protocol will pay special attention to the creation of a relevant sample (size, choice of sites) with the need of a counterfactual (what would have happened in the absence of the industry operations?) in mind. The sample must consider a variety of harvesting and post-harvesting methods employed and determine to what extent they are linked to the specific interventions of the industry / existence of value chains with demand for biomass. This will help establish correlation between impacts and biomass use by the industry. Note that the sample will have to include sites with past interventions, possibly several years, and the postdoc will benefit from the networks developed by the main supervisor in this sphere.
- Develop a conceptual framework to study causality. The causality between impact observations and the use of biomass should be distinguished from correlation, if only because the supply chains operate partly in collaboration with other initiatives such as Working for Water (WfW) programme and restoration by not-for-profit organisations. For instance, it is not always clear that harvesting operations took place in response to the demand by the industry (e.g. it could be opportunistic to use

the biomass once land was cleared); reversely the industry may rely on (partial) funding by governmental programmes (e.g. WfW) but applying their own standards of operation.

- Design a methodology to assess impacts of harvesting operations depending on their *modus operandi* with a choice of impact categories depending on the feasibility of the assessment with the resources available (accessible datasets, needs for primary data collection, etc.). Proxies could be developed based on the condition of the land as observable through satellite imagery, reports of post-harvest treatments or direct observation on the ground could be contemplated depending on the size of the sample, etc.
- Contribute to the writing of at least one peer-reviewed article and associated products (e.g. policy brief) to present the approach and results.

Requirements and duration

The candidate is expected to:

- hold a PhD in any relevant discipline (social sciences, biology, forestry) with experience in impact assessments in relation to the environment. PhD must have been obtained in the last five years;
- have knowledge in remote-sensing and ability to use related softwares;
- have a compelling publication record;
- have experience of Southern Africa.

The position is to be filled as soon as possible. The contract will be for a one-year period and the contract extension will be dependent on the availability of funding. It will be based in Stellenbosch with a possibility to work remotely part of the time (applies especially to candidates based in the Western Cape province).

Fellowship stipend

The candidate will receive a tax-free fellowship stipend in the range R 240,000-400,000 (**net of any income tax**, equivalent to EUR 15,000-20,000) commensurate with their experience. Under special circumstances, the stipend may exceed the upper limit and a relocation package could be provided.

Please note that postdoctoral fellows are not appointed as employees, and their fellowships are awarded tax-free. They are therefore not eligible for employee benefits.

Application

All applications should be sent to Romain Pirard (pirardr@sun.ac.za) and include a CV, a letter of interest and at least two referees.