

Postdoc position at Stellenbosch University (South Africa):

Biochar business models and socioeconomic impacts

The position in a nutshell

This position is a unique opportunity to contribute to the intense discussions on the role that biochar could play for climate change mitigation and adaptation. While biochar is often presented as a solution to many environmental issues and is expected to play a key function on the carbon markets due to its alleged contribution to carbon dioxide removals, its feasibility at scale remains disputed. The postdoc will provide support to on-going research on the variety of business models and the identification of the most promising ones in South Africa and beyond. This will be associated with a preliminary assessment of the socioeconomic impacts of biochar value chains.

Institutional background for the postdoc position and the supervising team

This postdoc position is funded by the Cluster of Excellence for Nature-Based Solutions and the Horizon Europe project MarginUp. It is hosted by the School for Climate Studies (“the School”) at Stellenbosch University (SU), South Africa.

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.

Leading the field in the move towards a carbon-neutral university, SU launched the School for Climate Studies 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 supervised by the School for Climate Studies and will report to Dr Romain Pirard.

Description of the work and deliverables

Biochar is increasingly identified as a very promising option for climate change mitigation and is often presented as a case of Carbon Dioxide Removal (CDR) that is both affordable (relative to other nascent expensive technologies such as Direct Air Capture) and includes many co-benefits. These very positive characteristics of biochar have triggered numerous studies concluding on the large scale of potential adoption as well as the burgeoning of carbon certification standards and methodologies that display very high prices for carbon credits on the CDR markets. This in turn, has led to a great interest by investors with high expectations about the financial feasibility of value chains that would use various sources of biomass due to the high level of revenues generated by the sale of carbon credits. Besides, in South Africa biochar could contribute to the development of value chains to make use of the biomass from the harvesting of invasive alien trees for the purpose of land rehabilitation. Yet it appears that existing studies lack an analysis of the economics of biochar so that this potential remains largely unknown.

Here, we aim at going beyond the current state of knowledge and debates with a view to informing the real potential of biochar for climate change mitigation. We do so by exploring the viable business models for biochar value chains (in Southern Africa) depending on the sources of feedstock, the types of carbon credits issued, and the role of biochar sales as an agricultural product to provide a source of complementary revenues and ensure financial feasibility to eventually attract investors at scale. Note that we limit ourselves to biochar applied to soils and do not consider other uses such as energy production, water filter systems, or any other type of biochar-based product.

The study will answer two research questions: What business models, if any, would be suitable for biochar to contribute to climate change mitigation at scale in South Africa and beyond? What are the socioeconomic impacts of biochar value chains?

The postdoc will coordinate with the supervisor to propose a research methodology that will allow them to conduct the following tasks:

- Determining the various sources of feedstock and their associated costs of supply in South Africa while assessing their differences (cost, access, volumes, conversion factor, eligibility, carbon accounting, etc.) with a focus on woody biomass from invasive alien trees;
- Determining the biochar production costs w/o feedstock costs and depending on the sources of feedstock;
- Discussing carbon gains that would be eligible based on existing methodologies to issue carbon credits;
- Exploring the existence of a market for biochar in South Africa and the market prices;
- Concluding on the business models (w/o biochar sales, feedstock sources, types of credits and values) that hold potential for the biochar value chains in South Africa and the associated volumes;
- Describing and analysing the socioeconomic impacts that biochar value chains would generate both positive and negative and depending on feedstock sources, with a focus on biomass from invasive alien trees.

The design of the study will be discussed with the supervisor considering that these tasks will combine literature reviews and primary data collection based on field surveys and interviews with stakeholders (including market actors and scientists).

The postdoc will be expected to submit at least one paper to an international peer-reviewed journal, a report for the project MarginUp, and contribute to secondary products to disseminate results such as blogs.

Requirements and duration

The candidate is expected to:

- hold a PhD in any relevant discipline (environmental economics, agricultural economics, business management). PhD must have been obtained in the last five years;
- 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 for another year will be dependent on the availability of funding and submission of papers. 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 350,000-450,000 (free of income tax, equivalent to USD 20,000-25,000) commensurate with their experience.

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.