

The Rufford Small Grants Foundation

Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Tuyeni Heita Mwampamba
Project title	Soil analysis for completing a carbon model for the sequestration potential of soils and biomass of regenerating tropical forests in the South Nguru Mountains
RSG reference	19.05.08
Reporting period	May 2008 – September 2009
Amount of grant	£5,756.98
Your email address	thmwampamba@gmail.com
Date of this report	06 th November 2009

1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Soil analysis (carbon, nitrogen, phosphorus)			✓	Enabled by diverting all resources and attention to achieving this in the allocated time period.
Soil analysis (simple fractionation)	✓			Several reasons contributed to our decision to exclude this analysis. It was not a priority; it is costly; lab space was limited, and we were unable to hire a more experienced assistant to take over the process once it was underway.
Statistical analysis			✓	
Development of predictive carbon model		✓		Desired anticipated model not feasible for soils. Ongoing reviews on how to modify the procedure. Equations on biomass accumulation over time now available, however.
Reporting of results		✓		Results have been reported in the form of a) professional talks at scientific meetings, b) informal report to the Director of partner organisation Tanzanian Forest Conservation Group, c) PhD dissertation to the Tanzanian Commission of Science and Technology. Reporting still required to farmers and stakeholders in the study area, to the district and regional Forestry & Beekeeping Division of the Tanzanian Ministry of Natural Resources & Tourism, to the forest carbon discussion group on the Tanzanian Natural Resource Forum, and as scientific papers in peer-reviewed international journals. Reporting did not feature in the last budget, however. Rather, it was presented as one of the project objectives.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

- a. Less funding than requested was available to us due to a fall in the British £ relative to the US\$. We decided to omit the fractionation analysis to reduce costs.

- b. The carbon and nitrogen analyser equipment in the lab I was using broke down after only 150 of 715 samples had been analysed. Remaining samples had to be outsourced to a commercial laboratory, which increased the total cost of analyses. To minimise costs, we decided to consolidate samples to the plot level which also released funds for completing wood density work that had stalled.
- c. Having missed the ideal time to hire lab assistants, we employed someone with no experience in soil processing. Training time extended the employment duration by about two weeks and slowed down the microbalancing process by almost three weeks. The costs saved by consolidating soils covered the additional costs related to her extended employment, however.

3. Briefly describe the three most important outcomes of your project.

- a. We now have a very good understanding of carbon content in soils and biomass of primary and regenerating forests in the study area; we can now begin to realistically assess the potential for carbon marketing and to extend the findings to other areas with similar social and ecological conditions.
- b. We now know how local land use practices affect carbon accumulation in regenerating forests. We can now advise farmers on “best practices” for maximising carbon potential of their farms while they are still in production for future sequestration once abandoned.
- c. Our inventories of tree diversity in the study area indicate that in addition to carbon storage and sequestration, secondary forests are valuable repositories for indigenous trees, including threatened endemic and near endemic species. Reports of presence of endemics in post-agricultural fields are relatively uncommon in the literature.

4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Thus far, local involvement in the project has been strictly in the form of local jobs as field assistants. A total of 11 local botanists, three locally based field assistants, three camp staff and more than 20 porters were hired in the course of the fieldwork. Village government leaders have been our first point of reference in every village; they were briefed of the project and selected the local botanists that would accompany the research team. Much more rewarding benefits are expected at later stages of the project when the outcomes of these initial phases are translated into carbon payments for communities and/or individuals.

5. Are there any plans to continue this work?

Yes. The next phase of the project is to determine how participation of farmers in the carbon market will work and whether additional ecosystem services (e.g. biodiversity protection, pollinator services, hydrological services) can be measured and included in the payments. This will involve an analysis of household income and farmer land use decision-making, and an assessment of local institutional capacity to manage forests and the resulting carbon payments.

6. How do you plan to share the results of your work with others?

- a. As presentations (posters or talks) at local and international science and policy meetings.
- b. Publication of the dissertation/thesis as a complete document.

- c. Publication of each chapter of the dissertation/thesis as individual peer-reviewed papers in scientific journals.
- d. Presentations and workshops with farmers in the study area on management of secondary forests for carbon.
- e. As discussion topic in the Tanzanian Natural Resource Forum, particularly in the Forest Carbon discussion group.
- f. At individual meetings with the Forestry and Beekeeping Division of the Tanzanian Ministry of Natural Resources and Tourism, particularly the relevant District forest officers in Morogoro Region.

7. Timescale: Over what period was the RSG used? How does this compare to the anticipated or actual length of the project?

The RSG was used between August 2008 and January 2009. This is the actual length of time anticipated in the proposal although the proposal had anticipated June to November 2008.

8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.

Item	Budget amount	Actual Amount	Difference	Comments
soil analysis	4,522	2,469	2,053	We drastically reduced the number of samples 1/5 by consolidating soils, then eliminating fractionation analysis.
lab assistant	1,823	3,662	1,839	We increased work hours to 40/wk and work duration took 4 weeks longer than anticipated.
wood density	Unbudgeted	217	217	We included this component due to funding availability made possible by eliminating soil fractionation analysis. This improved our carbon estimates for above ground biomass
Total	6,345	6,347	-3	Cost > RSG (=£588) were covered by another grant (UC Davies Jastro Shields Summer Research Grant). Exchange rate used: \$1 = £0.6022

9. Looking ahead, what do you feel are the important next steps?

Evaluating the socio-economic feasibility of carbon projects from a household and community perspective (Who will participate and how will it work?).

- a. Initiating a carbon payment pilot project in the study area through the voluntary carbon market.
- b. Evaluating the potential to include other ecosystem services to boost income and enhance forest conservation efforts.
- c. Establishing long-term chronosequence plots in which carbon accumulation and forest regeneration can be measured and monitored for many years to come.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Yes.

- a. RSG logo was used on the first page of four presentations that were given to the public about the project and its outcomes: a 15 minute presentation at the Society for Conservation Biology meeting in Chattanooga, Tennessee; a 15 minute presentation at the Ecological Society of America meeting at Milwaukee, Minnesota; a 50 minute lecture on the project for an undergraduate course on Environmental Management at University of California, Davis; and a 15 minute presentation at the Association of Tropical Biology and Conservation meeting in Marburg, Germany (July 2009).
- b. RSG was acknowledged as the main funder of the project in all four presentations and on the acknowledgements page of my dissertation. RSG has also been acknowledged in all manuscripts resulting from the dissertation chapters. The papers are being submitted to peer-reviewed international scientific journals.

11. Any other comments?

The South Nguru Mountains carbon project is now ready to undergo the next stage along the process of developing payment for ecosystem services programme that enables farmers to receive financial incentives for promoting and protecting forest regeneration in their areas. We hope that RSGF will continue to be an avid supporter of the efforts being made to achieve the short- and long-term goals of this project.