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	Joshua Tsamba
Project title	Assessment of freshwater biodiversity in three rivers situated in a montane region of a tropical country: conservation implications for surrounding communities
RSG reference	15288-1
Reporting period	Final Report
Amount of grant	£5640
Your email address	joshuatsamba@gmail.com
Date of this report	13 July 2015

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
Ecological assessment of freshwater crabs with implications to conservation.		✓		We managed to locate one species which is the commonly occurring, *Potamonautes obesus*. The most important and targeted species *P. mutareensis* was not found in the study sites.
Ecological diversity of amphibians in lotic freshwaters.		✓		In this objective, the amphibian species *Amietia angolensis* and the endemic *Amietia inyangae* were identified in the study area. However, human activities were major threats to these two amphibian species especially downstream of Nyangombe River due to increased human presence and activities.
Macroinvertebrate diversity and diatom assemblages in lotic freshwaters			✓	Indicator species which show pristine environments were located in Pungwe River and upstream Nyangombe. Downstream Nyangombe had a lower macroinvertebrate diversity, of which most species indicated impacts of human activities and signs of stress.
River limnochemistry			✓	River limnochemistry corroborated with results of macroinvertebrate diversity which were used as indicator species of water quality and river health.
Determine main threats to population of biodiversity in lotic ecosystems		✓		The main threats to the aquatic biodiversity we identified were climate change, fire, the invasive tree species (wattle) invading waterways and plantations and various activities associated with it.
Community involvement and conservation awareness		✓		This is still an ongoing programme. Our awareness is mainly targeted at Parks and Wildlife Management Authority in Nyanga, Chinhoyi University of Technology (CUT) undergraduate students and the surrounding communities. A field trip involving CUT undergraduate students was conducted recently (May 2015) so as to develop and increased conservation awareness in young scientists. A seminar at the University of Zimbabwe was carried out on 19th November 2014 to share results obtained in our study. Community meetings were carried out every field trip. Our main drive now will be to increase awareness among local communities and all stakeholders.

Training and involvement of local team members		✓		Two students from Chinhoyi University of Technology were directly involved in the project and developed undergraduate projects through the study.
Mapping of species distribution	✓			This objective is still pending due to lack of resources.

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

Accessibility to sites in the rugged terrain of the Eastern Highlands was impossible especially in the rainy season as a result two main rivers (Nyangombe and Pungwe) and their subtributaries were assessed for invertebrate biodiversity. The Kairezi River which is a transboundary river on the border between Zimbabwe and Mozambique was not accessible due to need for official protocol and the danger of landmines left in the ground during the war of liberation for Zimbabwe. As a result only the perspectives of communities and conservation awareness campaigns were conducted in the areas bordering the Nyangombe and Pungwe River. The conservation awareness campaigns for schools were made difficult by the red tape bureaucratic protocols to be followed in Zimbabwe. However, we were able to overcome this challenge by roping in the Nyanga National Parks authority and a local university, Chinhoyi University of Technology who provided a platform for us to access school children through their environmental awareness campaigns and career guidance tours in the Eastern Highlands.

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

1. There was a comprehensive documentation of aquatic invertebrates (macroinvertebrates, freshwater crabs, amphibians, and diatoms) in selected and accessible rivers in the Nyanga National Park which is a vital part of the Eastern Highlands. This documented baseline survey can lead to a publication to be used for future aquatic resource conservation, stream rehabilitation and restoration efforts.

2. Quantitative and qualitative river habitat integrity assessment was undertaken and we were thus able to identify and assess the natural and anthropogenic threats facing aquatic invertebrates and amphibians in streams. This is hoped to kickstart a process to influence policy making on developmental issues, preservation, conservation and utilization of both terrestrial and aquatic resources with a particular focus on mountainous areas in Zimbabwe.

3. Through the involvement of local parks authority, school heads and local leaders in the aquatic invertebrate awareness campaigns mounted in the Nyanga part of the Eastern Highlands we have increased and improved the awareness for ecological and environmental conservation at a local level. This has led to the Nyanga National Park authorities adopting a community based quarterly river monitoring program for all the rivers located in the Nyanga National Park.

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

The local parks authority, school heads and local traditional leaders as well as unemployed youths were roped in at different stages of this project. As a result the Nyanga National Park authorities

adopted a community based quarterly river monitoring programme for all the rivers located in the Nyanga National Park. This programme is ran by the local parks authorities involving local youths as part of long term sustainable efforts to conserve aquatic biodiversity.

5. Are there any plans to continue this work?

We plan to continue this work and expand the area of coverage to include the sensitive Chimanimani, Vumba and Chirinda areas where we believe there are more undiscovered endemic aquatic invertebrates. However, ongoing community based awareness programmes are still underway.

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

For each aim that was fully achieved as stated above we are in the process of writing full scale manuscripts that we intend to publish with international reputable journals. We are in the process of engaging the local Manicaland newspapers to serialise and produce some brief tit tats that will be published regularly documenting this invaluable research. We successfully involved undergraduate students whose mandate was to assist with research simultaneously learning scientific skills. Their theses will be part of the local university libraries academic material that will be used to share the results of the research. Seminars were conducted at the University of Zimbabwe as aforementioned and at Chinhoyi University of Technology (by students); this was to engage experts in the fields of ecology and conservation biology.

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

The funds were used over a 1-year period. The overall project continues, conservation awareness is an ongoing process that requires continuous reminders to all stakeholders involved.

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	Budgeted Amount	Actual Amount	Difference	Comments
Vehicle hire and diesel fuel	1630	2470	840	We had under estimated the cost of hiring a 4 X 4 vehicle that was suitable for travelling the terrain in Nyanga and Chimanimani. Thus, the cost of hiring the 4 x 4 truck and fuel stretched our budget.
Accommodation (principal investigators and research assistants)	1100	1540	440	The two national parks are very safe areas to camp, thus, instead of staying in the expensive chalets in Nyanga we were able to camp during all our field trips. However, we had insufficient camping equipment and in most cases had to be accommodated in the local

				community households for a fee.
Equipment	560	1320	760	Apart from the GPS, camera, stationery, amphibian and macroinvertebrate guides, waders and nets we had budgeted for, we had to include camping material such as tents and gas cylinders and cookers, torches for night sampling and instead of one amphibian guide we had to buy four because of the need to identify several species we came across. We also had to buy several other macroinvertebrate guides and diatom guide books.
Research permit and Park entry fee	0	310	310	We were supposed to acquire parks permits for our work and also entry fees, especially for the various community members that we engaged with in our study.
GIS lab equipment hiring and use	300	0	-300	This objective has not yet been achieved. We had to use the money to buy more equipment.
TOTAL	**3590.00**	**5640.00**	**2050.00**	

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

We feel if there are more resources availed we could go on to document the contribution of aquatic invertebrates in aquatic ecosystems and on the livelihoods of people inhabiting the mountains in Zimbabwe. This is because local communities need to know economic benefits of these aquatic ecosystems in order to find value in them. Also, mapping of the distribution of the located species is still pending and requires funding.

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, the support RSGF was duly acknowledged in all our presentations and seminars. Several other young scientists were encouraged to apply for the grant to further pursue their work which is lacking funds. The RSGF logo is displayed on our information packs and all our posters. The RSGF will also be acknowledged and mentioned in our publications from this work.

11. Any other comments?

Our deepest gratitude goes to RSGF for giving us an opportunity and the capacity to do this project.