The Rufford Foundation
Final Report

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

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. 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. Please note that the information may be edited for clarity. 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	Issah Seidu
Project title	Freshwater and Odonata Conservation: Research and Community Education in Pra Basin, Southern-Ghana.
RSG reference	25004-2
Reporting period	
Amount of grant	£5000
Your email address	antwiseidu88@gmail.com
Date of this report	2019.10. 10

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
Determine Odonata species population and distribution in the Pra Basin				This objective cannot be achieved in a 1-year project. Pra Basin has four major rivers (main Pra, Offin, Birim and Anum Rivers) with various tributaries, which are intersperse on a large surface area of 22,106 km^2. As a result of the vastness of the project study area, we initially focused on two main rivers (main Pra and Offin Rivers) and their tributaries during the project implementation. We have so far recorded a total of 49 Odonata species in the main Pra and 62 species in the Offin Rivers and their tributaries including the Owabi and Barekese wetlands. We have developed a long-term plan to sample the whole area in our subsequent project implementation.
Assess anthropogenic activities in the Pra Basin and highlight important areas at risk				We recorded both human activities fringing the waterways, environmental and biotic factors that have the potential of degrading the waterways. It is evidently clear that these rivers and their tributaries have been subjected to intensive anthropogenic disturbances. Notable among the degradation impacts we recorded during our survey were the use DDT in fishing, riparian farming, sewage disposal amongst others.
Developing and expanding the dragonfly biotic index (DBI) in the Pra Basin				We have assigned each recorded species in the Pra and Offin Rivers an index following Simaika and Samways, (2014). We have numerically assigned index for all the various sites, and prioritise some streams, rivers and ponds for immediate conservation. Our next approach is to complete our survey expedition in the other two

				main rivers and their tributaries and then combine the findings of the project in the whole Pra Basin to develop comprehensive DBI for southern Ghana.
Produce user friendly pictorial guide with distribution map for Odonata in Southern Ghana				Developing pictorial guide was a much bigger task than we initially anticipated. We have so far collected photos of most of the Odonata species we encountered in these Rivers. We need more time to scan the literature, gather illustrations and write short appropriate texts to support the guide.
Community awareness and public education in freshwater and biodiversity conservation in fringing communities				This project raises awareness on the plight of Rivers and streams, Odonata and other freshwater biodiversity in the communities fringing the main Pra and Offin Rivers. We employed different strategies to get our message across. Our conservation and awareness models were tailored to meet the varying interest, faith groups and subcultures within the various communities.
Train and mentor students in Odonata sampling protocol				A total of one postgraduate and six undergraduate students from the Department of Wildlife and Range Management at the Kwame Nkrumah University of Science and Technology (KNUST) have been trained in odonata identification and monitoring protocol. Training workshop meant to bring freshwater ecologist, students, odonata enthusiast, and some conservation NGOs is yet to be organised in December 2019 at the Faculty of Renewable Natural Resources.

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

We experienced an unprecedented heavy rain even in the dry season periods which intermittently delay our survey activities. Given that adult dragonfly sampling requires some clear weather with sunshine as they are very active during these weather conditions forced us to continue postponing our survey activities. The delay

and continue postponement of our sampling programme directly burdened our budget, as the cost of fuel increased. This also increased the cost of our budgeted items including hiring of vehicles.

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

a) We are happy to report that our community conservation and educational campaigns influenced behaviour change towards conservation of freshwater habitats in 15 different communities and at least 500 community people. This was achieved through our tailored community-driven conservation programmes including houses to house campaigns, after work/school meetings and our community radio-based campaigns amongst others. We are happy to see nine rural communities fringing the Pra ad Offin Rivers taking practical steps in mitigating threats to rivers and streams. These steps include farming a distance away from waterways and using appropriate fishing gear for their fishing expeditions. These communities have adopted punitive measures specifically fining and banning fisherfolks who use unwarranted fishing methods such as DDT and caging, as well as punishing offenders who dispose domestic sewage in waterways to deter others from engaging in such acts.

b) We are again happy to report that this project further engaged one postgraduate and six undergraduate students, who were trained in dragonfly identification and monitoring protocols. Of these six students, two were assisted to design and collect a three-month intensive data on dragonflies to use for their final year BSc thesis.

c) Further, large amount of scientific data on dragonflies and damselflies and the associated habitat variables have been extensively collected along the two rivers and their tributaries. Areas including streams draining into the Barekese Dam, the Owabi, Sukobri, Sunsua streams amongst others which were previously unexplored were given much attention. A complete species list of Odonata to be incorporated into monitoring index which will indicate and help prioritise habitats that need special conservation and management attention due to endemic and rare species and ecosystems functioning as well as habitat requiring restoration is almost ready to be published. One most significant outcome of our Rufford project is the publication of two project findings in two different recognized international peer-reviewed journals- the Odonatologica Journal and International Journal of Zoology.

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

We initiated the project by actively engaging the traditional authorities and opinion leaders in their various communities from 6th June to 17th July 2018. We had in-depth discussion with them, draw from their experience and incorporated into our conservation models. We further organised community meetings attended by 38 community members from four nearby villages to inform them about the rational and objectives of the project.

We conducted intensive community education and awareness creation campaigns in 15 different communities via organizing community after work and school meetings, distributing flyers, fact sheets, posters, project t-shirts. We also organised three local based radio programmes for 2 months. Local people were given the opportunity to interact and contribute to the programme and show their knowledge on freshwater biodiversity and freshwater habitat conservation to increase their understanding.

5. Are there any plans to continue this work?

Yes. We plan to increase our survey for Odonata and assess threats to freshwater habitats in areas previously not explored in the study areas. We have extensively surveyed two main rivers including the Main Pra and Offin Rivers and their tributaries during this project implementation. We hope to continue and escalate our sampling effort to the Anum and Birim Rivers and their tributaries which form integral part of the Pra Basin. With this dataset from the Anum and Birim Rivers and other equally important rivers in southern Ghana, we can appropriately develop the identification guide and DBI for southern Ghana.

We also plan to increase and intensify awareness campaigns and change behaviour towards freshwater habitats. Even though we have achieved success in enhancing behavioural change towards rivers and streams conservation in some rural communities, more local communities are still degrading waterways fringing their various communities and hence, warrant our efforts to escalate community and awareness creation campaigns in other fringing rural and semi-urban communities in Pra Basin in southern Ghana.

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

We have shared our project findings with the students and lecturers at Department of Wildlife and Range Management of KNUST through PowerPoint presentations. We have further disseminated findings of the project to some conservation NGOs in Ghana including Arocha Ghana and THRESCOAL. We have also broadcasted the activities of the project through local Radio stations.

Two scientific papers emanating from the project have also been published in the International Journal of Zoology and Odonatologica Journal for wider readership. We are planning to publish the project findings in conference proceedings and Agrion Newsletters and further disseminate to other project partners and local stakeholders.

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

The Rufford Foundation Grant was used approximately within a 16-month period, which spanned from May 2018 to September 2019.

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
Cost of vehicle rental, fuel and lubricant	2000	2100	100	There was an unanticipated Increment in fuel price and vehicle rental.
Cost of heavy metals and physicochemical variable assessment	210	210		
Conservation education (printing of educational materials, radio broadcast programs and organizing meetings)	950	950		
Daily sustenance allowance for team members during project implementation	1250	1250		
Purchase of journals, field guides, maps, errands, photocopying and other printing materials.	100	200	100	Some journals were purchased at a high price which was not anticipated prior the project. We also photocopied high number of data sheet, due to intensive sampling of the odonata and collection of environmental and physicochemical variables.
First aid and anti-malaria drugs	100	100		
Cost of printing field guide, photocopying, reporting, file keeping and errands and dissemination of research findings	290	290		
Project monitoring and evaluation	100	100		
TOTAL	**5000**	**5200**		

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

a. To escalate and intensify awareness and community education campaigns on freshwater habitats especially rivers and streams in rural and peri-urban communities fringing these waterways.
b. To continue conducting intensive survey for Odonata in areas previously not explored in Ghana.
c. To continue assessing the degree of anthropogenic threats to freshwater biodiversity.
d. To continue unrelenting to develop the DBI and the photo guide for Odonata in Ghana and other neighbouring West African nations.
e. To continue training citizen scientists, students and amateur odonatologist who will ensure research on Odonata and freshwater biodiversity lingers for long in Ghana.
f. To continue liaising with local project partners and local stakeholders to promote the conservation of freshwater biodiversity.

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

Yes. The Rufford Foundation Logo was used in all our printed educational materials including flyers, fact sheets, t-shirts. We acknowledged Rufford Foundation during our PowerPoint presentation, training, local meetings and local radio-based conservation programs. We also acknowledged Rufford Foundation in the two published scientific journals.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Issah Seidu (Principal Investigator)
I coordinated and oversaw the full execution of the project. I was also responsible for training students and locals in odonata species monitoring and sampling protocols.

Mr. Enoch Boakye-Acheampong
He was responsible for assessing environmental and heavy metal contamination of water.

Abena Agyapong
She led the awareness creation and community education campaign aspects of this project.

Antwi Razak
He assisted during odonata surveys. He also participated on the radio programs as well.

Martin Luther King
Luther was responsible for taking diagnostic photos of the species in the field and during the conservation programs.

12. Any other comments?

We are most grateful to the Rufford Foundation for providing us funds. This project would not have been possible without such a fund.