

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. 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	Hodabalo Pereki
Project title	Assessment of species diversity, vegetation structure and human activities in the dry forest of Abdoulaye protected area (Togo, West Africa)
RSG reference	9298-1
Reporting period	15th June 2012
Amount of grant	5950
Your email address	perekih@yahoo.fr
Date of this report	16 June 2012

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
To study the diversity of Abdoulaye Reserve dry forests;			Yes	Successful. Our research discovered <i>Dioscorea burkiliiana</i> (Dioscoreaceae) as a new botanical signalisation in this reserve and for Togo. <i>Pararistolochia goldieana</i> (Aristolochiaceae) never collected in this area was also found in this reserve.
To determine these forests structure;			Yes	Successful
To identify, assess and clarify different human activities pressures on Abdoulaye Reserve.			Yes	Successful

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

We encountered enormous difficulties before having a real access to Abdoulaye Wildlife Reserve (AWR). First because the access to the reserve is totally interdicted for any reason, even in research studies cases. Although we got all authorisation papers from the Environment Ministry and the National Fauna and Reserve Office for facilitation, we wasted two works day with local managers in charge of AWR.

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

1. Species composition and diversity of dry forests

A total of 258 plant species belonging to 119 genera and 63 families were found in APA dry forests. The highest relative frequencies were recorded by *Anogeissus leiocarpa* (83.37%), *Pouteria alnifolia* var. *alnifolia* (73.37%), *Cola gigantea* (50%), *Diospyros mespiliformis* (50%) and *Dialium guineense* (40%). The lianas species are dominated by *Rourea coccinea*, *Dioscorea dumetorum*, *Cissus populnea*, *Dioscorea burkilliana* whereas the dominated herbaceous of the undergrowth layer were *Anchomanes difformis*, *Chromolaena odorata*, *Olyra latifolia* and *Oplismenus hirtellus*. In terms of woody species, 903 individuals were encountered representing 67 species, 52 genera and 63 families. The three species with the highest stem number are *A. leiocarpa* (153), *D. mespiliformis* (106), *P. alnifolia* var. *alnifolia* (66). Several indices were computed to analyze the alpha diversity such as Simpson's Reciprocal, Hill's, Alatalo's, Margalef, Dominance indices and Family Importance Value. Based on alpha diversity description and distance between Poste de Contrôle Forestier (forest checkpoint) and plots, three vegetation groups namely F₅, F₁₀ and F₁₅ (respectively 5, 10 and 15km from forest checkpoint) were found and characterized by high variation for the most of indices computed. However, by converting Shannon-Wiener Index into Hill's Index, also a non-parametric index, the meaningful difference between these groups were easily appreciated through the generated diversity numbers 37.67, 89.13 and 81.41 respectively in F₅, F₁₀ and F₁₅.

2. Forest structure

a. Height class structure of the stands

The observed height structure for the overall stand in AWR shows a bell-shaped for all the groups discriminated with a predominance of individuals from 10 to 20 m.

b. Diameter structure

The observed diameter structure for the overall stand shows a bell-shape, and “L” shape reflecting different dynamic stage of the stands. The bell-shaped is characterized by a left dissymmetric distribution with the average classes recording the most represented individuals from 22.5 to 32.5 cm. However with the “L” shape, the first diameter classes i.e. 10–30 cm recorded the highest number of trees.

3. High threats on species conservation

AWR dry forests are converting in woodland caused related to human activities. The main threats on conservation status of AWR dry forest were trees burning, mutilating and scratching. Thus, in F_5 burned and scratched trees represented 13.72% and 7.18% respectively while in F_{10} burned trees and mutilated trees represented 22.22% and 11.11%. This latter human pressure is highest in F_{15} where mutilated and burned trees were estimated at 40.74%, 42.59% respectively.

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

Our project has a total agreement of local communities. Since 2003, when people were put out to AWR, all activities were banned in this reserve, even NTFPs, water and medicinal plant species collection. We recognised that local forest actors do not know well the current limits of AWA and what kind of resources will be needed to local people. By combining their helps with the effort of local guides, we have gathered important data on illegal activities and practices sites were now geo-referenced in AWR.

Some of the wishes of local communities were taken in account in our recommendations as capacity building in scientific name of plant species. A list of pictures of plant species with their ethnobotanical name was printed for local guides for future investigation through seminary-focus group. We have also demonstrated the role of AWR as elephant conservation site.

5. Are there any plans to continue this work?

Yes. We propose to establish permanent plots in AWR for continual monitoring to update forest-threatened species. We need also to demonstrate the potential role AWR, a current *in situ* biodiversity conservation area as ecological niche, refuge or habitat of some agroforestry species plants according to the species turnover in the current context of climate change. A grid of 1 km x 1 km is now creating in our lab. for this kind of data collection. Lastly, updating is highly desirable to the government in the preparedness of forest sustainable management in Togo.

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

Master students and PhD Candidates of our Lab. were involved in my project to gain experience as me also. The results were shared together with other senior researchers from University of Lome,

Hamburg University of Applied Sciences, Center for International Forestry Research (CIFOR) - West Africa Regional Office (WARO) and University of Abomey-Calavi in Benin. Some posters of our work were sent to National Fauna and reserve Office of Togo with copy to a local NGO in Tchamba involved in the management of communal forest nearby to AWR.

As young scientist and researcher, I am planning to disseminate the results in **International Journal of Biodiversity and Conservation**. And the current manuscript submitted is titled **Measurements of alpha diversity and important value indices for woody species conservation: Abdoulaye Protected Area dense dry forests (Togo, West Africa)**.

Some results have been presented during national symposium, international meeting and conferences:

“Climate Change and Dry Forests Management: Above Ground Biomass Measurements in Abdoulaye Wildlife Reserve of Togo” for poster presentation at IRD and public universities of Togo Symposium, held the 28 November 2011 in Lome, Togo.

“Climate Change Adaptation and Mitigation Challenge: Biodiversity Safeguarding and Forest Management in Abdoulaye Protected Area (Togo, West Africa)” for Poster presentation at the first IUFRO-FORNESSA Regional Congress and ITTO/AFF Forest Policy Day held from 25 – 29 June 2012 in Nairobi, Kenya.

“Improving sustainability of Abdoulaye Wildlife Reserve and neighbourhood for REDD++ profit for local communities (Togo, West Africa)” for Poster presentation at “Les Changements Globaux : Enjeux et Défis”, held from 9-11 July 2012 in Toulouse, France.

Firstly, I have benefit contacts, and scientific advices from senior researchers valuable for my future plan in forest and biodiversity conservation, and secondly, in order to carry out a high quality PhD thesis researches.

My next disseminations will be:

“Measurements of alpha diversity and important value indices for woody species conservation: Abdoulaye Protected Area dense dry forests (Togo, West Africa)” accepted as Poster presentation at *Symposium Tribute to the First Rector of the University of Abomey-Calavi, Professor Emeritus Edward Adjahoun*, to be held from 26-28 September 2012 in Abomey-Calavi, Benin.

“Measurements of alpha diversity and important value indices in landscapes for woody species conservation in the Abdoulaye Protected Area (Togo, West Africa)”, accepted as Poster presentation to the next IUFRO Landscape Ecology Conference, to be held in November 2012 in Concepcion, Chile.

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

I have received my funding the 04 July 2011. The RSG funding was used approximately in one year but not exactly in the previous period fixed. This discrepancy does not affect the length of my project in terms of duration.

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.

1 £ sterling ≈ 743,907 fcfa

Item	Budgeted Amount	Actual Amount	Difference	Comments
Laptop computer (Dual core, Pentium T)	1300	1008.064	+291.936	I found the same laptop with characteristics needed at an affordable price.
Numerical camera	500	513.440	-13.44	I also bought the cover of the numerical camera
Suunto clinometer + Altimeter + Compass +Secateurs +Topofil	450	+487.231	-37.231	I no longer buy Topofil because the order of this equipment should take a long time. I preferred used the Topofil of our lab.
GPS+ transfer cable	350	210.66	+139.34	Senior researchers who already used e eTrex recommend this one which have a good satellite receptivity in forest canopy
Herbarium materials	50	49.395	+0.605	Not significant
Tent	50	49.338	+0.662	Not significant
Book allowance (Benin analytic flora+ English-French Advanced dictionary)	100	129.032	+29.032	I bought two Benin analytic flora to make easy the botanical identification of species collected during the field work by each team
Special publications + photocopy	50	35.658	+14.342	Enormous publication have been download
Numerical support (DVD, removable disc, hard disk, card for camera)	250	232.325	+17.675	I bought three additional hard disks, to secure picture and all data for their uses in the future.
Costs of field work (fuel, lubricant, vehicle maintenance)	1200	1200	0	
Lodging and subsistence allowance (me and the driver)	800	1100	-300	During my field work, I associated two master students and one PhD Candidate to assist me in data collection in the purpose to finish the in time.
Manpower (1 guide/interpreter)	200	200	0	-
Manpower for herbarium assemblage (sticking on craft sheets)	100	100	0	-
Attendance to scientific meetings	300	60.483	+239.517	A part the printed fees of my Poster I self- sponsored I was granted by

				the meeting Congress Bursary Committee who offered me free registration , accommodation and air ticket to attend the meetings
Marker (black and colours)+Ink (black and colours)+ Sheets	250	137.096	+112.904	Our Lab. provided me freely a part of these equipment
Total	5950	5205.722	+444.278	This rest will be used to pay the charge fees of my article related to this project sent to International Journal of Biodiversity and Conservation.

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

According to our findings (news plant species signalisation and discovering) we can conclude that AWR is a hot spot biodiversity site in the Dahomey Gap incompletely prospected. Biodiversity inventories must be continued in the purpose to fill this lack of data like in similar tropical region of the world. So it is highly desirable to continue inventories to update biodiversity for sustainable management in Togo. Anthropogenic impact on the forest stands of AWR was carried in this work but we also recommend further specific studies on conservation status and habitat of species in AWR according to the species turnover in the current context of climate change.

The next steps are:

- To continue the biodiversity investigation and to detect occurrence point of multipurpose species usually used (*Anogeissus leiocarpa*, *Pterocarpus erinaceus* etc) by local communities and to update forest-threatened species.
- To determine predictive niche of these species and agroforestry species found in AWR (*Parkia biglobosa*, *Vitellaria paradoxa* etc) related to climate change.
- It was observed in this study that elephants contribute to some species seeds dispersions (such as *Borassus aethiopum*) indirectly related to the spatial patterns of the biodiversity of AWR and forest dynamic. In the next step will clarify the interrelation between elephants and *Borassus aethiopum* seeds dispersion in AWR.

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. I have used the RSG and in all my presentation. I displayed the Logo in a suitable position on all my publications relating to the project. And as acknowledgments, I expressed in all my publications relating to this project a special thanks to Rufford Small Grants Foundation for financial support and grant given to me.

RSG was my own first grant a received from an international foundation for my work. Thus my PhD supervisor, Prof. Koffi AKPAGANA, 2nd Vice-President of University of Lome, talked about this grant at an international symposium on “**Forest for the future sustaining society and the environment**” held in University of Lome and the purpose to motivated young researchers to take my example.

On 30th May 2012 I was invited by the Office of External Cooperation of University of Lome called DIRECOOP-UL to talk about international grants and awards for researchers and how to fulfil an application form. In all my presentation Rufford Small Grants Foundation was in prominent position in my speech and it web site was my example.

11. Any other comments?

I am greatly indebted to all surrounding local communities of AWR and our local guides. Without their dedication and support this field work could have not been completed. I would like to extend a very special thank you to Dr Ing. Fifanou VODOUHE who firmly recommended me RSG to consolidate my grounding in several aspects of biodiversity conservation through result sharing and contacts with other biologists. I would also like to thank Prof. Dr. Ing. Brice SINSIN. Dr Jules ASSI, Dr Komlan BATAWILA for helping with letter of recommendation and comments, Prof. Dr. Koffi AKPAGANA , Dr Kperkouma WALA who assisted with various aspects of this research including suggestions, technical facilitation and field work.

I would like to point out that through my results from RSG, I received other scholarship opportunities and joined Assistant Researcher Staff of University of Lome called ATER. I have gained skills in field activities as well as individual projects management. Some of my experiences will be useful to plan the field work with my future students.