The Rufford 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	Emeline Sessi Pelagie ASSEDE
Project title	Diversity, socio-economical importance and participatory conservation of orchids in the Biosphere Reserve of Pendjari (Northern Benin)
RSG reference	16855-1
Reporting period	March 2015-February 2016
Amount of grant	£5000
Your email address	assedeeemeline@gmail.com
Date of this report	25th February 2016

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 specific richness of orchid species in the Biosphere Reserve of Pendjari (BRP)			■	Thirteen orchid species were inventoried in the BRP with three epiphytic and 10 terrestrial. The most represented genera are *Eulophia* and *Habenaria* (respectively 31% and 21 % of orchid inventoried). *Calyptrochilum christyanum* (Rchb.f.) Summerh. is the most common epiphytic orchid in farmland and protected area.
Characterise the habitat of orchids			■	Sixty per cent of orchids were observed in gallery forest, 25% in savanna (mainly shrub savanna and grassland) and 15% in woodland. All epiphytic species were inventoried in gallery forest. In gallery forest, orchids were present on rocky soil at more than 250 m. The average tree and herb cover are respectively 70% and 25%. The dominant herb and tree species were *Rottboellia cochinchinensis, Andropogon gayanus, Breonadia salicina Berlinia grandiflora* and *Syzygium guineense* in this habitat.
Identify the use patterns of orchids species according to each ethnic group surrounding the BRP			■	All the respondents knew and used different parts of orchids. The overall ethno-botanical use of orchids varied among the targeted tribes (Gourma, Wama and Berba) and sex. Gourma have more knowledge in orchid use. This result could be explained by their proximity to the core zone of the BRP and their dependence to natural resource use. We identified a total of four ethno-botanical uses: medicine, food, social and cultural. All studied ethnic groups used orchids in medicine.

Awareness creation through analytical workshop				A series of sensitisation workshops were conducted in different villages in the valley and as per the project proposal, all the necessary educational and awareness materials were prepared.

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

- Ethnobotanical survey on orchid species (3 months)
The survey coincided with the land preparation period for the crop. Most of local people with knowledge on orchids are farmers and not available at home. The fields around the Biosphere Reserve of Pendjari are far from the habitation, so farmers sometimes preferred to stay on their farm for the whole week or can come back home by night very late. This made difficulty the ethno-botanical survey on orchid species as the sampled population (farmers) is not available all the time. To solve this problem of availability of respondents, it was necessary to accompany the farmers on fields, and even help them in their farming activities while collecting our data.

- Field surveys
The Biosphere Reserve of Pendjari is at 650 km to the University of Abomey Calavi. The good and clear identification of orchids at university require the presence of flowers on the sample individuals. The flowers of almost orchids fade at most 2 days after harvest. In herbarium, the leaves of terrestrial orchids also rot very fast. However, most of the terrestrial orchids were collected in the core zone of the reserve in flooded plains or hills with difficulty in accessing the site. So the challenge was to keep fresh samples from the field to the university (the university is 1 days travel from the field). The strategy was to go on the field with nursery pots. Thus, the samples are harvested at each time with the substrate in place and potted. Each sample is watered to be kept wet and alive until their transfer to the university. The herbaria are done with adapted materials in the laboratory of the University of Abomey-Calavi after identification.

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

Baseline data on orchid species from Pendjari Biosphere Reserve (BRP): Thirteen orchid species were inventoried in the BRP with three epiphytic and 10 terrestrial. Sixty per cent of orchids were observed in gallery forest, 25% in savanna (mainly shrub savanna and grassland) and 15% in woodland. All epiphytic species were inventoried in gallery forest. Since the awareness programmes made the local people realise the endangered orchid population and native orchid species, so they themselves started to nurture the rare species. The discussion and conservation talks we had with local communities and the awareness of it, remind them the value of endangered orchid population and native orchid species; they are also awarded and prepared for the future.

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

Local people were directly involved in this project implementation during the field survey and farmer's school. Field guides and local people have been involved and trained in orchids inventoried and identification. During ethno-botanical survey we have employed a casual worker at least one per village. Therefore these employed guides and interpreters benefited from cash payments. At least local communities participated in all steps of awareness sessions. They concluded from the results of the project presented during awareness the importance of gallery forest in epiphytic orchid's conservation.

5. Are there any plans to continue this work?

During our project, we record *Calyptrochylum christyanum* mainly in gallery forests of farmlands with a great development. The species seems to select specific host threes. The question is:

- Is *C. christyanum* more conserved in farmland than the protected area? It is important to understand the development conditions of *C. Christyanum* development with the concept of gap analysis.
- What determines the presence and the great development of *C. christyanum* on a tree species as host tree?

We can then highlight the importance of farmland habitats in orchid conservation. So, in collaboration with local population (who know from this project the importance of orchids), we will develop strategies for habitats reconstitution. An emphasis will be making on gallery forests.
This study recorded the orchid diversity in the BRP. However, the challenge for conservation is related to population density. It is important to cover more area and really point out the threatened orchids species. So the second step of this project will also cover the W Biosphere Reserve (the second and biggest biosphere reserve of Benin) with focus on the density of orchid population.

As far as awareness is concerned, it is necessary to develop some tools for long term awareness and to share them with NGOs, public administration, etc.

It is also important to follow the revision of the Flora of Benin (Flore Analytique du Bénin) where some records of orchid species found during this project in the BRP are not included.

We plan also to prepare a catalogue which will highlight the orchid species and the degradation of their habitat to sensitize local population. Moreover, to have an important impact, it will be necessary to develop and reinforce an awareness plan towards school kids around the two protected areas of Benin (the Biosphere Reserve of Pendjari and the W Biosphere Reserve).

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

The collection of field data has generated an overview of the diversity, habitat characteristic and importance of orchids.

- ✓ The results were shared through two national workshops in 2015 ("National week of Protected Areas" and "5ème Colloque des Sciences, Cultures et Technologies de l'Université d'Abomey Calavi") which brought together several stakeholders: forest officers, protected areas managers and scientists from West Africa. During the workshops, two orals and one poster presentation have been done on:
  - Human activities and epiphytic orchid diversity in dry season in the Biosphere Reserve of Pendjari (Benin, West Africa);
  - Orchid diversity and endogenous knowledge in the Biosphere Reserve of Pendjari (Benin, West Africa).
- ✓ A conference paper is in preparation and will be submitted for publication with African Journal of Ecology on "Human activities and epiphytic orchid diversity in dry season in the Biosphere Reserve of Pendjari (Benin, West Africa)".
- ✓ Currently we are working on two manuscripts in titles:
  - Diversity and local value of Orchids species in Sudanian zone of Benin;
  - Modelling Orchids declines and extinction risk under anthropogenic activities.

  Data analysis are on-going and the articles will be submitted to "Bois et Forêt des Tropiques" and "Pant Ecology and Conservation".
  The orchid photos will be post on "West Africa Plant Database" (http://www.westafricanplants.senckenberg.de/)
  We will also follow International conferences opportunities to present the last results of the project as oral or poster communication.
- ✓ The main outputs of the project will be put on the National Clearing House Mechanism (bj.chm-cbd.net) of the CBD.

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 planned to cover 12 months. This timeline has been respected. The project length was 12 months

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
Canon Power Shot SX510 HS Point-and-Shoot Camera	200	200	0	The camera bought was made available to other researcher from my home institution
Transportation from work station to PBR and within site	1500	1500	0	This amount was used for car hiring and fuel purchasing
Scientific literature	100	200	-100	This was used to buy some book of atlas on orchid species
Field surveys and local workers	700	800	-100	The project required a local field assistant who helped in field surveys, contacting voluntary groups and keeping touch with the leader on regular basis.
Awareness, education and lobbying implementation	900	900	0	This was essentially training workshop for local communities
Communication: internet, phone	100	100	0	
Awareness material (poster, technical papers)	200	200	0	Many posters was elaborate and distributed among project stakeholders for education and awareness purpose
Workshops organization	1200	1000	+200	The Pendjari Biosphere Management office has assisted us in given us the conference room for free and the £200 budgeted for conference room hiring was allocated to other activities
Questionnaire sheets and field guide for ethno-bonatical survey	100	100	0	Mainly use to prepare the questionnaire sheets
TOTAL	5000	**5000**	0	

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

- Extend the study to W Biosphere Reserve. I will inventory orchid species, habitat characteristics and ethno-botanical uses.
- Study population dynamic of orchids in relation with habitat degradation to highlight the threatened orchids.

- Produce a catalogue of orchid's species of the two most important Biosphere Reserve of West Africa (W and Pendjari Biosphere Reserve) to highlight their importance for conservation.
- Organise a training seminar for students on the relation between habitat degradation and sustainable use of orchid species.
- Monitoring and evaluation of awareness raised and level of sustainability achieved.

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?

The RSGF logo has been used along the project and will continue to be used during the different results divulgation. Before our two oral communications, we highlighted RSGF logo on the first slide. At the end of each communication we specified that the activities are funded by the Rufford Small Grants Foundation and, acknowledgment were done to RSGF. The RSGF logo was also showed on the last slide of the presentations. A conference paper has been submitted for publication on "Human activities and epiphytic orchid diversity in dry season in the Biosphere Reserve of Pendjari (Benin, West Africa)". We expressed a particular gratefulness to the Rufford Foundation for financial support of the study through Rufford Small Grants for Nature Conservation.

The RSGF logo has a pride of place at any restitution workshop and training and awareness material. On the poster designed for National Week of Protected Areas (NWPA), the RSGF logo was also posted with acknowledgment to RSGF. Finally the Rufford Small Grants Foundation was also acknowledged in the two manuscripts we are going to submit for publication.

11. Any other comments?

Rufford Small Grant Foundation gave me good opportunity to work on an important and interesting research topic for biodiversity conservation. The collaboration between Jane and her daily follow up along the project stimulated me to achieve all the planned results in my project. I hope to have the confidence of RSGF and, to be granted for the second step of the project.