Final Evaluation Report

Your Details	
Full Name	Houdanon Roël Dire
Project Title	Conservation of mushrooms through the establishment of edible mushroom value chain and the optimization of sensitizations
Application ID	27719-2
Grant Amount	5,000
Email Address	roelhoudanon@yahoo.fr
Date of this Report	07 January 2020

1. 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
Train the rural populations of the Bassila region on the artificial cultivation of edible fungi				Training on mushroom cultivation should be done in five villages for 50 people. But finally, it was done in three villages but for 50 people coming from all the preselected villages. We can say that this goal has been achieved
Reforest degraded forests into partner trees of fungi, especially *Afzelia africana*		X		The nursery has created a lot of trouble for us. In the project, we planned to plant 4000 plants but unfortunately, only 2300 plants were able to obtain. This objective has been partially achieved.
Analyze in detail the disparity in ethnomycological knowledge from new ethnomycological surveys to propose new methods of awareness in the region of Bassila in northern Benin		X		The forest reserve of Bassila is surrounded by 10 villages. Both projects helped us to investigate the 10 villages. The results obtained during the first project are being associated with those of this project for the writing a scientific paper that is not yet unfortunately completed. We plan to submit the paper in March 2020 and sent to Rufford once accepted for publication in an international journal.

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

The first difficulty encountered is the construction of mushroom houses. This year was marked in Benin by strong and continuous rains. This initially prevented the mushroom farms from being built in the pre-set timescales. Due to the construction material (red must), the mushroom houses that were built were damaged in two villages. So, we let the rain period become less intense and resumed construction in the remaining villages.

The second difficulty encountered is the nursery. This year, it was initially difficult to access seed of *Afzelia africana* in the forests where we collected it during the first project. We had to collect the seeds in other forests and also buy them. The first nursery we installed was attacked by micro insects that could not be identified by

our team. So, we installed a new nursery in another village (Baka Baka) with a group of women who already have a mastery of nursery production techniques. The budget allocated for this activity only allowed us to rebuild a nursery of 2300 plants of *Afzelia africana*.

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

Ethnomycological studies allowed us to identify 27 edible species in the remaining five villages around the reserve forest of Bassila. Among known species and which have not cited by the five first villages, we have *Cantharellus platyphillus, Amanita crassiconus* and *Cantharellus solidus.* We have also, 14 unknown species by our team member which have been cited by local population. This study also allowed us to identify, contrary to the first project, an edible parasitic fungus of *Parkia biglobosa* ("gourèkoko" (unknown eight in first report)) that is used in traditional pharmacopoeia to treat burns, muscle pain, nerve and heart disease.

The most appreciated species by the local population are notably *Termitomyces shimperi, Termitomyces letestui, Psathyrella tuberculata* and *Cantharellus solidus and* rare edible species are *Cantharellus platyphillus, Termitomyces schimperi* and *Amanita crassiconus.*

Finally, training on the culture of the mushroom has shown us that the use of rice straw is easier and more beneficial for rural populations. The next formations must therefore focus on this substrate.

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

The people have really invested in achieving of the objectives of this project. Concerning the construction of the mushroom farm, they helped us in the construction of the buildings by putting at our disposal their know-how in term of "construction of mud house". Chief's villages and forest management groups have helped us a lot by mobilising people for us for ethnomycological studies.

The nursery was made thanks to the women's group of forest management and who also participated actively in the reforestation of the degraded facies of the gallery forests.

5. Are there any plans to continue this work?

The execution of the first project and this second project allowed us to identify species that are unknown to our team and we suspect that it has many species that are unknown for science. It is estimated that fungal diversity in Benin is expected to be about 18,000 species of which almost 3,600 (excluding lichens) are epigeous mushrooms. All of the taxonomic work undertaken reveals that only up to 3 % of this estimate is identified until to specific level (Yorou *et al.* 2017). The remainder have not been collected and reliably identified or represent undescribed species. So, we hope in the next project to study taxonomically and phylogenetically these species

to identify or describe them for the science. Other collections will also be done to document the diversity of fungi in general in the Bassila Forest Reserve.

Regarding the first activity of our project, we had difficulty to provide mushroom seeds to the populations. We believe that the establishment within the Laboratory of Applied Ecology of a seed production unity will control mushrooms chain value in the municipality of Bassila.

We believe that in the next project, the study of ethnomycological data received will allow us to give better awareness sessions to the populations of Bassila. Awareness and its success are very important because they allow to educate people about all that are related to the environment and to change their mentalities. Finally, we think that we will have to continue to reforest the forest reserve of Bassila, the partner trees of the mushrooms, especially those which are classified on the Benin red list and international as threatened.

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

We plan to share the results of our project through symposia (Symposium of the University of Abomey-Calavi, Symposium of the University of Parakou) and through publications in international scientific journals.

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

The project is expected to last 9 months (from February to October 2019). Unfortunately, we were not able to finish on time and we needed another one month to finalise the project.

8. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Room renting	234	234		
Accommodation and food	500	500		
Workshop transport per diem	250	250		
Conception of pamphlets	140	140		
Tree nursery and planting cost	600	685	+85	The first nursery that was made was attacked by insects. We had to abandon it after ineffective

				treatments to establish another
Assistant for seed nursery and guide for Ethnomycological studies	1050	1050		The abandonment of the first nursery to build a second nursery should increase the cost of this item. But fortunately, we had the help of a group of women who helped us for free but to whom we promised to learn mushroom cultivation
Fuel for motorbike	366	366		
Motor-bike rental	450	450		
Travel to the field	125	133		Unexpected increase in transport costs
Internet, Fax, telephone	150	150		
Literature consulting	60	60		
Office furniture (CD, Paper, floppy disk) and Copy of questionnaire	125	117	-8	We were able to find a place to copy cheaper questionnaires
Equipment for mushrooms cultivation (gloves, fork, barrel, mushrooms seed, table, etc)	200	200		
Mushroom farm building	750	805	55	The rains and their intensities destroyed the construction of mud houses that we built. We had to repair some of them.
Total	**£5000**	**£5140**	**£132**	1 GBP = 727, 54 XAF

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

In the next project we plan to do taxonomic and phylogenetic studies to identify unknown edible species and many other species collected in the Bassila forest. Knowledge of the diversity of fungi is important to protect them from forest degradation.

We will also have to start by producing mushroom seeds. Mushroom seed is the essential link missing to create a sustainable edible mushrooms value chain in Benin. Knowledge about the production of mushroom seeds exists, but the Laboratory of Applied Ecology lacks the equipment to produce them sustainably.

Finally, we should continue the training on mushroom cultivation with the remaining villages in order to create around the Bassila classified forest, an edible mushroom value chain, able to be an additional source of income for the populations.

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

Yes, we used the Rufford logo on the posters presenting the project to the rural population and on all the training material on mushroom cultivation.

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

Jean Evans Codjia: Chief team of ethnomycological study

Ramdan Dramani: Agent of ethnomycological study

Francine Ollodo: Agent of ethnomycological study

Berince Houssouvo: Agent of ethnomycological study

Issifou Kassim Tchan: Agent of training on mushroom cultivation

Gerard Laourou: Agent of training on mushroom cultivation

Donald Yehouenou: Agent of establishment of nurseries of *Afzelia africana*

12. Any other comments?

I want to thank The Rufford Foundation for the support for the sustainable conservation of natural resources.