Final Evaluation Report

Your Details	
Full Name	Ngansop Tounkam Marlène
Project Title	Distribution and natural regeneration of *Garcinia kola* Heckel, a highly solicited vulnerable Non-Timber Forest Product in the Belabo Communal Forest, Eastern Cameroon
Application ID	32319-1
Grant Amount	£6000
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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
Socio-economic survey of G. kola in neighbouring communities of the Belabo Communal Forest and nearby markets				Using the referral sampling technique, we surveyed 12 wholesalers and semi-wholesalers of *G. kola*, and 123 collectors belonging to 24 villages neighbouring to the Belabo Communal Forest. Analyses of the data collected shows clearly high anthropogenic pressure on *G. kola* resource in and around the Communal Belabo Forest. This pressure is illustrated in the poor harvesting techniques for bark and roots of the tree and the high harvesting frequency for these parts.
Ecological niche characterization, Densities and natural regeneration of *G. kola* in the Belabo CF				Botanical Inventory was carried out over an area of 60 ha in the Belabo Communal Forest. In total, six different habitat types were found. The most frequent were mid-age secondary forests and young secondary forests. The least represented were different fallows and food crop fields. For this study, *G. kola* stems were found only in the mid-age secondary forest. During inventories, only three stems of G. kola were identified, leading to an estimated density of 0,075 stem/ha. No seedlings were recorded over the entire sampling area. *G. kola* exhibited the lowest densities, the absence of seedlings is indicative of very low natural regeneration potential.
Develop a process for conservation strategy and sustainable management of the species in the Belabo CF				A workshop was organised at the conference room of the Belabo Council with the presence of many stakeholders such as governments bodies (e.g., Ministry of Agriculture

				and rural development, Ministry of Forest and Wildlife, and Ministry of Environment, Protection of Nature and Sustainable Development), the Mayor of Belabo Council, the Belabo Communal Forest Unit, the research institutes (e.g., Agricultural Research Institute for Development and Millennium Ecological Museum), and local chiefs, and resource persons involved in *G. kola* exploitation (collection, use and marketing). We presented and discussed the results obtained during the socio-economic survey and botanical inventory of this species with main focus on anthropogenic pressure (poor harvesting techniques, poor regeneration efforts and bad resource governance) and its very low availability. The group discussion by brainstorming method resulted in strong recommendations and suggestions for the conservation and sustainable management of the *G. kola*. We are developing the recommendations into a sustainable management plan document for *G. kola*.
communication of the results				We shared the results of our project with the local management of the Belabo Communal Forest, and all other stakeholders present at the workshop. We also wrote a research report that we gave to them. Currently, we are preparing one scientific paper on the results of the study. The results were also presented at MEM. The Dissemination of the work will continue even after the project when possible.

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

Social distancing measures and government ban on inter-urban circulation delayed the implementation of some activities and especially the socio-economic survey and the focus group discussion. We rescheduled and executed these two activities only when the prevalence rate of the pandemic was very low, and government authorised movements and public gatherings with number of persons reduced.

Poor weather conditions characterised by heavy rains during the rainy season let to the postponement of the botanical inventory. We rescheduled and executed this activity when the rains reduced.

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

The first outcome of our project is the capacity building of six members of the Belabo Council Forest Unit in socio-economic survey and field data collection. In addition, to these six staff of the Belabo Communal Forest Unit, three graduate student and trainees at the Millennium Ecological Museum involved in the project have also their capacity in field data through socio-economic survey and plant inventory which are fundamental in conservation and natural resources management research.

Socio-economic survey shows a high pressure on *G. kola* resources in Belabo. This pressure is perceived in the poor harvesting techniques for bark and roots of tree, the high frequency with which bark and roots are collected, not leaving enough time for these parts to regenerate. Collectors debark trees, uproot completely to harvest the bark of roots leading to the death of many trees and an alarming decrease in the production potential of the trees (very low density of trees). In addition, the felling of trees coupled with little or no efforts to regenerate by populations has increased the scarcity of *Garcinia kola* resources, leading to very few persons involved in the collection as the resources are rare. Socio-economic survey also revealed important medicinal uses of the parts of the tree which could be advanced to explain the high pressure on the resources. Hence, it was reported that *G. kola* nuts and bark are used to treat typhoid fever, malaria, stomach ache hernia, sexual weakness and boosting of libido. As for commercialisation, selling prices vary according to the quality and quantity of the product (fresh, dry or powder for bark and quality and size of nut). Concerning the organisation of the value chain, the products are generally consumed (nuts) by the populations, used for the manufacture of alcoholic drinks (bark) or sold on the spot in the villages. The manufacturing of alcoholic drink from palm wine takes place throughout the year, explaining the very high collection frequency for the bark of tree. The semi-wholesalers in the markets of Bertoua and Belabo buy bark from the collectors and seeds from the wholesalers. *G. kola* fruits are highly consumed by rodents in the forest; this is one of the main difficulties encountered by the population in seed gathering.

Botanical inventory of *G. kola* was done in a total of 60 ha using line transect of 2500 m x 20 m. We found *a* density of 0,075 stems/ha for *G. kola* trees. No seedling was

found during inventory, evidence of very low natural regeneration potential for the species and the high level of human pressure on the resource.

The focus group discussion allowed us to develop strategies for the conservation and sustainable management of *G. kola* in the Belabo Communal Forest area. It was agreed with the different actors that the sustainable management of *Garcinia kola* will have to go through:

- sensitisation of local populations on the level of threat on the species population and its conservation concerns.
- raising public awareness of sustainable resource harvesting techniques.
- intensification of long-term research activities, particularly on the available potential in the forest block belonging to the Diang municipality, and in agroforest zones of Belabo communal forest.
- shortening of seed germination time and building capacities of local populations on vegetative propagation techniques.
- setting up a monitoring system for sustainable exploitation, through the Village Forest Management Committees (VFMC).
- the establishment of *G. kola* nurseries.
- integration of *G. kola* domestication into agricultural systems and appropriate forest areas.
- facilitating collaboration between relevant ministerial departments and institutions for *G. kola* management.
- participation in the development/revision and implementation of the *G. kola* management plan.

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

As we aimed to have long-term conservation of the resource in the area, the local communities needed to be included in all the different steps of the project.

Therefore, during the socio-economic survey in each of the 23 villages, one person was used as a resource person. In addition, during field data collection, at least six local people (communal forest managers and neighbouring villagers) were involved in the project and have improved their capacities and knowledge in field data collection and entry process, which is an important part, and challenge in biodiversity conservation.

Moreover, the focus group was conducted with the various administrative and traditional authorities, namely the mayor of Belabo Council, government institutions, local chiefs of the villages bordering the communal forest, local communities, wholesalers, and semi-wholesalers. They showed their satisfaction to participate in the development of strategies for sustainable management of *G. kola* in their community and pledged to serve as potential sensitisation agents for the sustainable management of *G. kola*.

5. Are there any plans to continue this work?

Yes, we plan to continue with this project. In fact, due to the very low densities and high pressures on *G. kola* resources in the Belabo Communal Forest despite the multiple benefits they provide to the populations, we aim to apply for the 2nd Rufford Small Grant which could support the implementation of onsite conservation action and regeneration through *G. kola* tree planting. This second phase will also guarantee an increase in the production potential of *G. kola* and improve the livelihood means of the local populations in the years ahead.

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

We have first shared the results of our study with stakeholders of the Belabo community involve in *G. kola* value chain; where during the focus group discussion, additional information on the sustainable management of this resource was provided. We are currently drafting the sustainable management plan for *G. kola* which will be made available to the Belabo Council, the ministries of environment, agriculture, and forestry and wildlife. The document will also be available to local communities in the various chiefdoms bordering the Communal Forest. A copy will be also available in the Millennium Ecological Museum. On the other hand, we are currently working on one scientific paper related to this project under the title: "Combining value chain and transect sampling, in assessing the level of threat on *Garcinia kola*, a vulnerable species in the Belabo Communal Forest, Eastern Cameroun". The publication will be available to anybody; then we will add them to our research platforms (i.e., Researchgate, LinkedIn, Facebook, Google Scholar) to be sure that we have maximised the communication.

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

The initial timescale for this project was 1st October 2020 to 30 December 2021; although the Covid-19 pandemic had a great impact on the schedule of our activities, we did our best to complete the project within the allowed time.

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
Miscellaneous	£198	£198		We used the funds of this heading to pay the expenses of royalty in the

				different villages in which we stayed, and for thepreparation of meetings for the different field activities (socioeconomic survey, botanical inventory and workshop.
Field equipment (GPS, Clinometer, Compass, Tape) and laptop).		£1330		All field equipment's were provided by the Museum worth this amount.
Workshop	£838	£2914	+£	This activity cost the Rufford project £ 1038, £ 1876 were paid for by the Museum. This budget line was used to cover, coffee, launch, transport and lodging of participants. The conference room was donated by the Belabo Council.
Processing, data analysis and communication	£540	£340	-£200	We spent £ 340 for communication costs and internet connection during the whole project. Team members did the data processing and analysis free of charge. The remainder, which is, £ 200 were introduced in the expense related to the workshop.
Gratification to local guides	£990	£890	-£100	This amount was spent as per diem for the local. The guides during botanical inventory. The remainder which is £100 was used for the vehicle maintenance in the field.
Accommodation	£576	£576		This amount was used to cover for the lodging of team members during the socio-economic survey. For the forest inventory they camped in the forest.
Daily subsistence field team	£1458	£1458		For this item we spent £1,458 for the living expenses of the team consisting of: £ 666 for 23 guides for 54 working days - £ 792 for the project team for 54 working days

Transportation	£1400	£1500	+£100	The expenses incurred here were for: -3 trips, Yaounde-Belabo/ Belabo-Yaounde. -finance for fuel (inter-site transportation). The vehicle for the inter-site transportation was provided by the Belabo Council +£100 was used for the vehicle maintenance in the field.
TOTAL	**£6000**	**£9206**	**+£3206**	The additional **£200** was paid by the museum.
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9. Looking ahead, what do you feel are the important next steps?

See the level of pressure on this resource and the importance of it for local people. We think that the next step will be to contribute to enriching this forest with this species. For that, we aim for the next step to:

- Increase the awareness of populations on sustainable resource harvesting techniques.
- Strengthen the capacities of collectors in sustainable harvesting techniques of different parts of the plant.
- Put one community nurseries in at least five villages that have for clusters of neighbouring villages to increase the production potential of the species and other valuable non timber forest product species.
- Strengthen the capacities of collectors on vegetative propagation technique.
- Strengthen the capacities of collectors on the management and monitoring of seedlings in a nursery; Identify and support local initiatives and best practices in *G. kola* production and conservation.
- Contribute to the reforestation of Belabo Communal Forest with *G. kola* as key specie.
- Establish a coordinated management system for the resource using a stakeholder engagement approach.

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, the Rufford logo was used on the following materials: formal letters, PowerPoint presentation, banderols, pen and t-shirts. During all field activities and presentations, it was explained to the participant, the origin of funds, which allowed us to carry out this study and main objectives of The Rufford Foundation and the place this project

occupies in the sustainable management of biodiversity for the wellbeing of local communities.

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

This project benefited from the expertise and advice of many scientific experts in the field of conservation. We thank:

Dr. Fongnzossie Feudoung Evarist. Lecturer at the University of Douala, Museum program coordinator; he was a supervisor of this study. He was of great help in the effective implementation of the project. It will also be of considerable support in the phase of scientific valuation of the results of the project.

Dr. Sonwa Jean Denis. Senior Scientist at Center for International Forestry Research (CIFOR), Central Africa Regional Office, Forest and Environment Expert. He was of great help in the effective implementation of the project. It will also be of considerable support in the phase of scientific valuation of the results of the project.

Dr. Simmy Bezeng. Head of Regional Program for the IUCN Red List and Key Biodiversity Areas Species Survival Commission/BirdLife South Africa, Conservation biology and drivers of biodiversity loss Expert. He was of great help in the effective implementation of the project. It will also be of considerable support in the phase of scientific valuation of the results of the project.

Dr. Takanori Oishi. Associate Professor at the African Studies Center, Tokyo University of Foreign, Antropologys Studies, Japan, Antropologist, Entnoecologist Expert. He was of great help in the effective implementation of the project. It will also be of considerable support in the phase of scientific valuation of the results of the project.

Dr. Mala William Armand. Associate Professor, Department of Plant Biology, University of Yaounde I, Cameroon. Natural Resource Management Expert. He has supervised socioeconomic survey planification before fieldwork.

Dr. Fobane Jean Louis. Lecturer at the Higher Teachers Training College, University of Yaounde I. He has supervised botanical inventory planification before fieldwork.
The socio-economic survey, field data collection and workshop team was constituted of:

Dr. Ngansop Tounkam Marlène. Project Manager, she has PhD Forest Ecology Natural Resources Management. During her PhD research, she worked on in Non-timber Forest Product (NTFPs), actually a lecturer at the University of Douala. She is also the Conservator of the Millennium Ecologic Museum. She was the Project Manager and team leader of this Project. She was involved in all the steps of the project.

Dr. Chimi Djomo Cédric. He is a PhD holder in Forest Ecology and Natural Resources Management. He is also a researcher at the Institute of Agricultural Research for the Development (IRAD). He was a Project Manager Assistant during the achievement

of this project. He was involved in socio-economic survey, botanical inventory and statistical analysis. He was also a panel member during a workshop (focus group discussion).

Dr. Zekeng Jules Christian. He is a PhD holder in Tropical Ecology and Plant Conservation. He is the Executive Coordinator of Conservation and Sustainable Natural Resources Management Network (CSNRM-Net), Yaounde – Cameroon. With his great expertise, he was involved in the socio-economic survey, botanical inventory. He was also a panel member during the workshop.

Mr Forbi Preasious Funwi. PhD Student in Plant Ecology and Natural Resources Management. In his PhD research, he consecrated part of his research which earned him the position of team lead for the socioeconomic survey which he conceived for this project.

Mrs Tchoupou Votio Mireil Carole. PhD Student in Tropical Ecology. She was the team leader of the Workshop organization. She was also the secretary during the workshop. She equally participated in the botanical inventory.

Mr Tchapda Charly. PhD student at the University of Yaounde I in Cameroon and intern at the Millennium Ecological Museum. He was involved in field data collection.

Tchonang Djoumbi Bienvenu Leonnel. PhD student at the University of Yaounde I in Cameroon. He was involved in field data collection.

Mr. Koue Dondjandji Justin. Intern at the Museum, he was involved in data processing and analysis, his capacities I, natural resource management were strengthened.

Mr. Ngodjo Obam Fabrice. Intern at the Museum, he was involved in data processing and analysis, his capacities I, natural resource management were strengthened.

Mr. Sapock Bidier Messi. Head of Agricultural Research Institute for Development, he was helpful for the preparation of the workshop, and will be a resource person for the second phase of the project.

Mr. Ayalang Arnaud. field team, botanist.

Mr. Bessendji Manga Nicolas. field team, local guide.

Mr. Yanou Clément. field team, local guide.

Mr. Gbapol Jacob. field team, local guide.

Mr. Essoulé Djangang. field team, local guide.

Mr. Bessala Alexandre. field team, local guide.

12. Any other comments?

Scientifics production from the project in process.

We are also looking for opportunities to present the results in upcoming seminars and conferences.