# 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** | Upendo Lufingo Msalilwa |
| **Project title** | Assessment of the status of African baobab (*Adansonia digitata* L.) populations and their ethno-botanical importance in Tanzania |
| **RSG reference** | 24376-1 |
| **Reporting period** | 01/02/1980 - 20/01/2019 |
| **Amount of grant** | £ 5000 |
| **Your email address** | msalilwau@nm-aist.ac.tz |
| **Date of this report** | 20/01/2019 |

**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 determine the status and distribution of *A. digitata* populations in different land uses in different agro-ecological zones in Tanzania | | | ✓ | -Reconnaissance surveys have already been conducted where by three major agro-ecological regions were identified.<br>-Field surveys to determine the status and distribution of the baobab tree were completed.<br>-Two manuscript drafts have been developed and are ready for submission to peer reviewed journals. The titles of the manuscripts are: (1) Emerging issues associated with conservation of the African baobab (*Adansonia digitata* L.) in the semi-arid zones of Tanzania; and (2) Pinpointing baobab (*Adansonia digitata)* population hotspots in the semi-arid regions of Tanzania. |
| To assess the variations of Cyclopropenoid Fatty Acids (CPFA) contents, physio-chemical properties and fatty acids composition in baobab seed oil from different agro-ecological zones of Tanzania | | ✓ | | -Field sample collections of baobab fruits/pulps from three different regions in the semi-arid regions were completed.<br>-Baobab oil samples sent to Sokoine University of Agriculture, Tanzania analysis of physio-chemical properties and fatty acids.<br>-Baobab oil extraction has been done and oil samples sent to Jombo Kenyata University, Kenya for the quantification and characterisation of cyclopropenoid fatty acids (CPFA). |
| To test an efficient method for removing or reducing the concentrations of Cyclopropenoid Fatty Acids (CPFA) in baobab seed oil from different agro-ecological zones | ✓ | | | -I am waiting for the results for objective 2 to be able to test the effects of different treatments in removing/reducing the concentrations of cyclopropenoid fatty acids (CPFA). |

| in Tanzania zones | | | | |
|---|---|---|---|---|
| To examine the use values and patterns of *A. digitata* by different ethnic groups in different agro-ecological zones of Tanzania | | | | -I have conducted the reconnaissance surveys and selected three regions (Iringa, Same and Dodoma) for the data collection.<br>-I have already identified three major ethnic tribes (Gogo in central region, Hehe in southern region and Pare in northern region) for the ethno-botanical importance assessment. This will focus on the use vales and patterns of African baobab and their perceptions on the utilisation of the baobab tree in different semi-arid regions.<br>-I have already developed the socio-economic data collection tools. |
| To examine the extent of domestication and conservation strategies by different ethnic communities and predict the future management of *A. digitata* populations particularly in the face of climate change. | | | | -I have conducted the reconnaissance surveys and selected three regions (Iringa, Same and Dodoma for the data collection.<br>-I have already identified three major ethnic tribes (Gogo in central region, Hehe in southern region and Pare in northern region) for the ethno-botanical importance assessment. This will focus on the use vales and patterns of African baobab and their perceptions on the utilisation of the baobab tree in different semi-arid regions. |

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

I expected to quantify and characterise the cyclopropenoid fatty acids (CPFA) in baobab oil in Tanzania. However, that has been possible due to lack of expertise and the availability of the CPFA stands in Tanzania. That led me to request for assistance of the baobab oil analyses at the Jombo Kenyata University.

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

1. Substantial different in status and distribution of *A. digitata* populations in different land uses in different semi-arid zones in Tanzania. Baobab density varied substantially and significantly across land use types, with the highest baobab density (2.45 stems per ha) being observed in strictly protected areas and the lowest density (1.52 stems per ha) was recorded in non-protected areas. There was significant ($p = 0.004$) difference in baobab density between

strictly protected and non-protected areas. Furthermore, there was a significant (p = 0.003) difference in baobab density in strictly protected and non-strictly protected areas. However, no significant (p = 0.687) difference in baobab density was observed in non-strictly protected and unprotected areas.

2. Substantial different in use values and patterns of *A. digitata* by different ethnic groups in   different semi- arid of Tanzania. I expect to see differences in the use patterns and use values in different semi-arid regions of Tanzania. Local communities in the central region (Dodoma) seem to value the baobab products especially fruits and oil as among the cash crops while in the northern (Same) and southern (Iringa) parts most of the communities regarded a crop of no important value to them.

3. Extent of domestication and conservation strategies by different ethnic communities and predict the future management of *A. digitata* populations particularly in the face of climate change determined. I expect to see that communities in the central region of Tanzania they have already developed the conservation measures of baobab like planting seedlings and protecting the tree for the future generation.

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

The study involved local people from the initial stage up to date. For the first objective, the study employed the stratified random sampling technique to assess the status and distribution of the African baobab both within and outside protected areas in the different land use systems in the areas of its occurrence. At each sample plot, land use was identified with the assistance of the field local people communities. Formal and informal discussions were conducted to find out historical occurrence of baobabs in the area, different management practices and their impacts on the species.

During the selection of the trees for collections of the tree for the fruit collection, local communities were involved in the selection and harvesting the fruits for oil extraction.

Focus group discussions will be conducted in order to identify the use value and partners in each region and identify the conservation measures of the baobab tree in each region.

**5. Are there any plans to continue this work?**

Yes, I am planning to continue this work after earning my PhD degree. My focus will be the on sustainable utilisation of baobab and conservation measures of the baobab.

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

The results will be shared in there different ways depending on the audience:

1) **Local people:** The results will be communicated back to the community through the meetings and brochures on the important and conservation measures of the baobab.
2) **Researchers:** I am expecting to develop and publish at least three scientific papers for the results from the study. Two draft manuscripts have already been developed.
3) **Policy makers:** I am expecting to prepare the policy brief on the sustainable use and conservation management of the *A. digitata* developed

**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 for 1 year. I expected to finish field data collection within 1 year but due to difficulties and logistical challenges encountered during field data collection, I am expecting to accomplish my research to deliver the results by December 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 |
|---|---|---|---|---|
| Reconnaissance survey | 233 | 524 | +291 | No of days increased as well as fuel cost |
| Actual field inventory | 1860 | 3049 | +1189 | I was expecting to conduct my study in 4 regions but it was advised to do in the whole semi-arid region of Tanzania ( 12 regions) |
| Fruit sample collection and extraction | | 1377 | +1377 | It was oversight was not in the budget |
| **Total  £** | **2093** | **4950** | **+2857** | Local exchange rate was 1£ = 3050.65 TSH |

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

Below are my next activities that I plan to accomplish in this project. I am planning to request for further financial support from the Rufford foundation grants to assist me finish my planned research activities.

1. Ethno-botanical importance assessment. This will involve collection of the socio-economic data from the three major ethnic tribes (Gogo in central region, Hehe in southern region and Pare in northern region);
2. To assess the variations of cyclopropenoid fatty acids (CFPA) contents, physio-chemical properties and fatty acids composition in baobab seed oil from different agro-ecological zones of Tanzania;
3. To test an efficient method for removing or reducing the concentrations of cyclopropenoid fatty acids (CFPA) in baobab seed oil from different agro-ecological zones in Tanzania zones.

**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, I have been using the Rufford Foundation logo in the progress report presentation and while I am in the field. Also, I will be using the Rufford Foundation logo and continue to acknowledge the Rufford Foundation in all the materials (journal papers, brochures and policy belief) that I will produce in relation to this project.

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

Members of the project are as follows:

**Upendo Msalilwa, PhD student at the Nelson Mandela African Institute of Science and Technology (NM-AIST)**
I was be involved in field data collection, analysis and report writing on the assessment of the status of African baobab (*Adansonia digitata* L.) populations and their ethno-botanical importance in Tanzania.

**Dr. Linus Munishi (Main supervisor)**
He is a Senior Lecturer in the School of Life Sciences and Bioengineering at the Nelson Mandela African Institute of Science and Technology (NM-AIST). He is the overall supervisor making sure the all study objectives are attained. He is a GIS expert making sure the GIS part is executed properly. He is supervising the following objectives:

i. To determine the status and distribution of *A. digitata* populations in different land uses in different agro-ecological zones in Tanzania;
ii. To examine the use values and patterns of *A. digitata* by different ethnic groups in different agro-ecological zones of Tanzania;
iii. To examine the extent of domestication and conservation strategies by different ethnic communities and predict the future management of *A. digitata* populations particularly in the face of climate change;

iv. To investigate the local peoples' perceptions on the established ethno-botanical values of different parts of *A. digitata* in different agro-ecological zones of Tanzania

**Prof. Patrick Ndakidemi (Co-Supervisor)**
He is plant and soil expert and currently employed as a Professor in the School of Life Sciences and Bioengineering at the Nelson Mandela African Institute of Science and Technology (NM-AIST). Like Dr Linus Munishi, Prof. Ndakidemi is supervising the above four objectives.

**Dr. Edna Makule (Co-Supervisor)**
She is a Senior Lecturer in the School of Life Sciences and Bioengineering at The Nelson Mandela African Institute of Science and Technology (NM-AIST). She is Food and Nutrition Expert and supervising the following objectives:

i. To assess the variations of Cyclopropenoid Fatty Acids (CFPA) contents, physio-chemical properties and fatty acids composition in baobab seed oil from different agro-ecological zones of Tanzania;
ii. To test an efficient method for removing or reducing the concentrations of Cyclopropenoid Fatty Acids (CFPA) in baobab seed oil from different agro-ecological zones in Tanzania zones.

## 12. Any other comments?

To deliver the results especially for those having conduct PhD studies it is important to give them more time (1year and 6 month) to accomplish their work.

I am very grateful to the Rufford Foundation for the financial support. I am thankful to my employer, Tanzania Forestry Research Institute (TAFORI) for granting me a study leave for PhD studies. Furthermore, I am thankful to the Tanzania Wildlife Research Institute, Tanzania National Parks and Tanzania Wildlife Authority for research clearance and permit to carry out the study. Additionally, I would like to thank the park rangers for their assistance during fieldwork in the protected areas and the local communities in the semi-arid regions for their cooperation during data collection.