Biodiversity Challenge Funds Projects
Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus
Half Year Report

Note: If there is any confidential information within the report that you do not wish to be shared on our website, please ensure you clearly highlight this.

Submission Deadline: 31st October 2023

Project reference	DARNV005
Project title	Understanding Ugandan native plant species' role in innovative sustainable landscapes
Country(ies)/territory(ies)	Uganda
Lead partner	Botanic Gardens Conservation International (BGCI)
Partner(s)	Tooro Botanical Gardens (TBG), GrassRoots Ltd (GR), Makerere University, National Agriculture Research Organisation (NARO) - Entebbe Botanical Garden (EBG)
Project leader	Alex Hudson
Report date and number (e.g. HYR1)	HYR2
Project website/blog/social media	*https://www.bgci.org/our-work/projects-and-case-studies/agroforestry-with-native-edible-plants-in-uganda/*

Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).

Although we are not looking for specific reporting against your indicators, please use this opportunity to consider the appropriateness of your M&E systems (are your indicators still relevant, can you report against any Standard Indicators, do your assumptions still hold true?). The guidance can be found on the resources page of the relevant fund website.

Output 1

Activity 1.5: Publish market research report:

A first draft of the market research report by GR, was completed and disseminated to project partners for comments and feedback. This provided initial recommendations on species from the target list to take forward based on information collected from visits to 18 markets across Uganda and talking to sellers and buyers within.

The report also provides marketing options and proposals for packaging. The findings were used in activity 2.5 when selecting species for product development. A final report with specific suggestions for marketing strategies will also be produced by the end of the project.

Output 2

Activity 2.2: Trained community members to collect food raw materials from target species for nutritional analysis:

The thirty-one community members trained in year 1 continued to collect raw food materials for analysis and deliver them to Makerere University. In total seventeen of the thirty-four target species were collected with voucher specimens taken for identification purposes and the materials sent to the Makerere University lab for nutrient analysis.

Activity 2.3: Carry out nutritional analysis on samples collected from all target species:

Nutritional analysis of continually collected raw food materials were analysed at Makerere University labs providing data for 14 of the species, with some collections being insufficient to complete analysis. Literature review was carried out by BGCI and Makerere University to gather other available data on species that could not be assessed in the project so aid in deciding which species to take forward for new product development (see activity 2.5)

Activity 2.4: Report on nutritional content of all target species produced:

Makerere University reported on analysis results of the following: Ash content, crude protein, dietary fibre, carbohydrates, fat & oil content, Vitamin A, Vitamin C, Iron, Calcium, Phosphorus, Potassium and Selenium.

The management team decided to rank the species based on their composition of particularly important nutrients - vitamin A, Calcium, Iron & Selenium – to support deciding which species to take forward for new product development. These were chosen because vitamin A impacts vision and organ function; Iron is essential for haemoglobin which carries oxygen around the body, a lack of which has been linked to many childhood and maternal diseases; Calcium because of its importance through pregnancy and in development of bones and teeth; and Selenium because it boosts immunity and so could help protect against infections, particularly in those with poorly functioning immune systems, like patients with HIV / AIDS.

For each of the 4 nutrients the species were given a score between 0 and 1 for how well the results would provide for a person's recommended daily allowance for that nutrient, with an overall score provided for the species by adding these scores together (out of 4). Table 1 shows the ranking for those species for which analysis was undertaken in the project.

Table 1: Ranking of 11 plant species in terms of vitamin A, Calcium, Iron & Selenium composition

Plant Name	Ca	Selenium	Fe	Vitamin A	Total Score	Average Score
1. Harungana madagascariensis	1	0.75	0.75	1	3.5	0.88
2. Pseudospondias microcarpa	1	0.5	1	1	3.5	0.88
3. Garcinia buchananii	1	0.75	1	0.5	3.25	0.81
4. Phoenix reclinata	1	0.5	0.5	1	3	0.75

5. *Syzygium cordatum*	0.75	0.5	1	0.5	2.75	0.69
6. *Annona senegalensis*	1	0.5	0.5	0.5	2.5	0.63
7. *Ficus sycomorus*	0.75	0.75	0.25	0.5	2.25	0.56
8. *Bridelia micrantha*	0.75	0.25	0.75	0.5	2.25	0.56
9. *Cordia africana*	0.5	0.75	0.5	0.5	2.25	0.56
10. *Treculia africana*	0.75	0.25	0.75	0.25	2	0.50
11. *Vitex doniana*	-	0.25	0.5	1	1.5	0.58

Technical reports on their nutritional composition of the species were generated and are being used to draft manuscripts to publish the results. The team aims to publish two manuscripts: one for the nutritional analyses and the second one for the plant field collections.

Activity 2.5: Agree 12 species to take forward for new food product development:

For selecting species, the management team met in August to decide how to decide which species to select for new food product development. It was agreed to score each species out of 10 for each of the 5 following parameters: 1) community and supplier interest from community workshops; 2) known current volumes available by the team; 3) available propagation knowledge; 4) how marketable the species are from activity 1.5; and 5) nutrition based on activity 2.4. It was also agreed to weight the scores in two ways for two different potential grower groups: small scale farmers looking for quicker incomes, and larger farmers more ability and interest to invest in slower growing tree crops.

The species chosen following this were 1) *Harungana madagascariensis*; 2) *Phoenix reclinata*; 3) *Amaranthus thunbergii*; 4) *Corchorus olitorius*; 5) *Solanum nigrum*; 6) *Annona senegalensis*; 7) *Vangueria apiculata*; 8) *Pseudospondias microcarpa*; 9) *Monodora myristica*; 10) *Tamarindus indica*; 11) *Cleome gynandra*; 12) *Vigna unguiculata*; 13) *Saba comorensis*.

Activity 2.6: Development of products from selected food species - including organoleptic testing:

This is planned for quarter 2 of year 2.

Output 3

Activity 3.1: Establish steering committee to meet every 6 months:

The last steering committee meeting was held in March 2023 with the next scheduled for November 2023.

Activity 3.4: Community nurseries propagate the target species provided by the seed collection networks for use in trials:

TBG's previously established satellite nurseries and seed collectors (from project 23-026) provided a source for the majority of the targeted 22 native tree species and 12 herbs / lianas planted in agroforestry sites. Six herb species have been propagated and integrated into in the agroforestry plots in year 2, alongside the previously planted tree species.

Activity 3.7: Carry out baseline monitoring of plots and surround areas:

Baseline monitoring of agroforestry sites was carried out to define relationships of farm crops and tree species integrated on the sites. Participatory monitoring has been undertaken between TBG and the community members / landowners of the demonstration plots. Assessment of intercrop plants between trees or shrubs was made at 3 points: when planted, as the crops grew and at harvest. Planted target individuals were monitored for survival, growth, and local land use decisions.

At Lwamunda, Fort portal and Kagadi all tree species planted survived and depict steady growth levels and healthy status. At Mbale agroforestry site all the tree species that were planted survived but individuals of *Monodora myristica* were noted to be struggling with stuntedness and while other individuals weathering. Termite attacks were noted to be an issue in Mbale on a few species and on *Warburgia ugandensis* at Lwamunda agroforestry site.

The project sought expertise from extension services to lead farmers at the agroforestry plots, such as advising on identification and management of pests and diseases and effective implementation of the agroforestry best practices.

Activity 3.8: Monitor plots quarterly:

Following development of monitoring and data collection forms set for agroforestry trials, the quarterly monitoring started at the beginning of year 2. Two monitoring sessions were concluded with support of the trained site managers. Data has been collected every three months to be used to demonstrate, in comparison to other land use systems, the advantages of agroforestry that incorporates native food plant species.

Continuously tree growth assessment to determine Current Annual Increment (CAI) and Mean Annual Increment (MAI) will be realised after completion of 1 year cycle of monitoring, these results are expected by quarter 4 of the project reporting.

Output 4

Activity 4.2: Co-creation workshops held with groups of 25 community members:

Following training of TBG and EBG by the BGCI project team in cocreation workshops in the year 1 of the project, 3 co-creation sessions with local community groups were conducted by Entebbe Botanic Garden and Tooro Botanical Gardens. At TBG 30 individuals participated in the cocreation session. During the co-creation session held at Tooro Botanical Garden, the co-creators participating in the session identified the best interpretation techniques and materials that could be use by the garden to: Increase the awareness of the conservation efforts carried out by the garden, promote agroforestry and native food and plant species.

Further open day sessions with communities are planned for the agroforestry sites in Lwamunda, Kagadi and Mbale in the second half of the year.

Activity 4.3: Radio programmes created and delivered monthly to promote agroforestry and native food plant species, including using co-creation workshop knowledge towards the project end:

The radio programs were created and delivered as part of the project public awareness campaign to promote agroforestry and native food plant species in Uganda. Four radio programmes have been made and aired in the mid-western altitude zone (Kagadi and Fort Portal). More radio programs in different agroecological zones are set for implementation in the second half of the year.

Activity 4.4: Interpretation materials designed, printed and installed at TBG using knowledge from co-creation workshops:

The TBG and BGCI project teams are currently working on interpretation panel designs and content. A similar process will be done with the EBG team in the second half of the year.

The information collected from the cocreation workshops has been collated and refined for inclusion on five panels planned for installation at TBG: Four (4) living collection areas and the visitor information centre have been identified for panel installation. These areas are:

- **The agroforestry site**: to create awareness and promote the benefits of agroforestry in sustainable farming practices with a focus of show casing agroforestry techniques, local success stories, and encourage sustainable agriculture.
- **Plant nursery:** Educate visitors about the nursery's role in conserving native plant species, focusing on propagation, the value of native plants, and plant conservation.
- **The Beehive- apiary section:** Raise awareness of the importance of bees in agriculture, showcase native bee species, promote bee-friendly activities. The panel will also highlight the significance of bees in pollination and ecosystem health.
- **Tourism arboretum**: this is intended to inform visitors about the garden's tree-conservation long history and culture to reflect human nature relationships; this highlights rare species, cultural related species, focusing on Biodiversity and nature-based tourism in Arboreta.

- **The Visitor information centre**: This is intended to provide an overview of TBG with major themes of sustainable plant use and biodiversity conservation.

At least 2 of these interpretation panels will be installed at TBG before the end of 2023 under this project, the rest will be done using matched funds from other projects in the future.

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

Seed collectors have struggled to collect liana seeds despite routine monitoring expeditions – this was due to inconsistent phenology. The TBG project team is working on trials for vegetative propagation from target liana species.

Fruit collectors have still been unable to collect some of the target species because of scarcity or seasonal variability in fruit production. For some, with tiny fruits or large seeds - like *Bridelia micrantha*, *Harungana madagascariensis* & *Phoenix reclinata* – a lack of fibrous pulp has continued to be an issue meaning a great deal of plant material was needed to carry out nutritional analysis tests. Others, like *Citropsis articulata* are extremely rare and restricted to the forested areas of the Albertine rift in western Uganda and some parts of central Uganda. It has not been possible to collect the fruits which are also competed for by other primates.

Some analyses (Sodium & Selenium) were delayed because of a breakdown in the lamps for analysis. These had to be ordered from Nairobi.

These issues will mean that collection, propagation, planting and nutritional analysis is unlikely to be completed on all 34 target species by the end of the project.

3. Have any of these issues been discussed with NIRAS and if so, have changes been made to the original agreement?

Discussed with NIRAS:	No
Formal Change Request submitted:	No
Received confirmation of change acceptance	No
Change request reference if known:	

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2023 – 30 September 2023)

Actual spend: £[redacted]

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2024)?

Yes ☐ **No** ☒ Estimated underspend: £

4c. If yes, then you need to consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a re-budget Change Request as soon as possible. There is no guarantee that Defra will agree a re-budget so please ensure you have enough time to make appropriate changes if necessary. Please DO NOT send these in the same email as your report.

NB: if you expect an underspend, do not claim anything more than you expect to spend this financial year.

5. Are there any other issues you wish to raise relating to the project or to BCF management, monitoring, or financial procedures?

No other issues to raise.

If you are a new project and you received feedback comments that requested a response, or if your Annual Report Review asked you to provide a response with your next half year report, please attach your response to this document.

All new projects (excluding Darwin Plus Fellowships and IWT Challenge Fund Evidence projects) should submit their Risk Register with this report if they have not already done so.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but should also be raised with NIRAS through a Change Request. Please DO NOT send these in the same email.

Please send your **completed report by email** to BCF-Reports@niras.com. The report should be between 2-3 pages maximum. **Please state your project reference number, followed by the specific fund in the header of your email message e.g. Subject: 29-001 Darwin Initiative Half Year Report**