Darwin Initiative Main: Annual Report

To be completed with reference to the "Project Reporting Information Note":
(https://www.darwininitiative.org.uk/resources/information-notes/)
It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes)
Submission Deadline: 30th April 2024
Submit to: BCF-Reports@niras.com including your project ref in the subject line

Darwin Initiative Project Information

Project reference	29-025
Project title	Sweetpotato, a model for food security and long-term conservation of biodiversity
Country/ies	Kenya, Madagascar, Peru, and Zambia
Lead Partner	Global Crop Diversity Trust (Crop Trust)
Project partner(s)	Fiompiana Fambolena Malagasy Norvéziana (FIFAMANOR) International Potato Center (CIP) Lima and Nairobi The Zambia Agriculture Research Institute (ZARI)
Darwin Initiative grant value	GBP 600,000
Start/end dates of project	1 June 2022 – 31 March 2025
Reporting period	Apr 2023 - Mar 2024, Annual Report 2
Project Leader name	Sarada [redacted]
Project website/blog/social media	https://www.croptrust.org/work/projects/darwin-initiative-funded-sweetpotato-project/ https://www.croptrust.org/news-events/news/chill-solution-for-meeting-future-demand-of-sweetpotato/
Report author(s) and date	Sarada [redacted], May 2024

1. Project summary

Sweetpotato is a vital subsistence crop in Africa with high micronutrient content and adaptive qualities for farming systems making it a globally critical component of food security. However, the unique diversity of sweetpotato landraces in low-income countries is poorly conserved and vanishing. This project introduces a multifaceted robust methodology to conserve and use sweetpotato genetic diversity as a model for the long-term, secure conservation of clonal crops, many of which are essential to smallholder farmers for increased sustainability and livelihoods.

The project name, *Sweetpotato Clean and Share*, clearly states the project objectives which are to collect sweetpotato landraces from Madagascar and Zambia, clean the sweetpotato landraces of all diseases, repatriate the phytosanitary cleaned material to small holder farmers in Madagascar and Zambia for enhanced productivity, and securely conserve this material long-term under the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) for use by future generations. The project is working in collaboration with the Seeds for Resilience Project (SFR) in Zambia and a USAID-funded BHA-project in Madagascar, both of which also supported the collection of sweetpotato landraces.

The project involves collection of farmers' sweetpotato landraces in both Madagascar and Zambia (maps of collection sites are included in Annex 4a) and the shipment of these landraces to the International Potato Center (CIP) in Nairobi, Kenya. The landraces are put into *in vitro* culture and phytosanitary cleaned using thermotherapy and meristem culture by CIP-Nairobi. The *in vitro* material is then multiplied, and the phytosanitary cleaned material is repatriated to the countries of origin where mass vine multiplication occurs prior to distribution of the cleaned vines to farmers for

planting. At harvest, surveys will be conducted using small farmer focus groups to assess farmers' impressions and satisfaction with the planting of the phytosanitary clean material. In parallel with these activities in Madagascar and Zambia, CIP-Nairobi will ship the collected *in vitro* sweetpotato landraces to CIP-Lima for long-term secure conservation in the in-trust global sweetpotato collection held for use by humanity under the auspices of the ITPGRFA. The landraces from this project will be available from CIP-Lima under the ITPGRFA and will be conserved for future generations in cryopreservation as part of the Global Plant Cryopreservation Initiative.

To date, collection of farmer sweetpotato landraces from both countries, Madagascar and Zambia, is completed and the landraces have been placed into *in vitro* culture by CIP-Nairobi. The number of landraces collected and securely transported to CIP-Lima far exceeded targets with 260 sweetpotato landraces collected from Zambia (collected under the SFR project) and 75 sweetpotato landraces collected from Madagascar. Twenty-seven landraces from Zambia are phytosanitary clean and 22 of these were successfully repatriated. Sixteen of these landraces were successfully multiplied in YR2 and over 44,000 vines have been distributed to smallholder farmers in 8 communities (camps) in Zambia by the end of April 2024. Twenty-five phytosanitary clean landraces were repatriated to Madagascar, of which 22 landraces survived and over 7,000 vines have been distributed from 16 landraces to farmers in 11 communities in Madagascar by the end of April 2024. Multiplication and vine distribution to farmers was delayed in Madagascar due to drought and natural disasters (cyclones). However, multiplication and distribution to farmers is continuing through May 2024. Two shipments of landraces between CIP-Kenya and CIP-Peru have occurred with the first shipment being released from quarantine in YR2. A subset of these landraces is in the process of *in vitro* multiplication for cryopreservation. Overall, the project is meeting targets and is substantially on schedule.

2. Project stakeholders/ partners

The project team includes:

- **ZARI**, a department of the Ministry of Agriculture and Livestock housing the Zambian National Plant Genetic Resources Center, is the lead partner from Zambia. In conjunction with ZARI, the project also includes the Zambian Department of Agriculture (DoA), the National Agriculture Information Services (NAIS), commercial vine multipliers, community leaders and farmers.
- **FIFAMANOR**, a Malagasy institution in Madagascar working in Rural Development and Applied Research, is the lead partner from Madagascar. In conjunction with FIFAMANOR, the project also includes CIP-Madagascar, commercial vine multipliers, community leaders and farmers.
- **CIP-Lima** in Peru, working in close harmony with CIP-Nairobi in Kenya, is the lead partner from CIP. CIP works closely with ZARI and FIFAMANOR for the collection of sweetpotato landraces in each country, the shipment of the landraces to CIP-Nairobi for placement into *in vitro* tissue culture and disease cleaning, the repatriation of the landraces back to the country of origin and the shipment of the landraces to CIP-Lima for long-term conservation. CIP-Lima is also coordinating the generation and analysis of DNA fingerprints for the material.
- **Crop Trust** is the overall lead administrative organization for the project.

The partners meet monthly for partner meetings via Zoom where all phases of the project are discussed and coordinated. Minutes from the meetings are distributed to all attendees for their future reference. Action items are highlighted and followed up in subsequent meetings until they are completed. This is also a critical forum where any challenges encountered are brought up and resolved as a group.

3. Project progress

3.1 Progress in carrying out project Activities

Overall, the project is on schedule and has completely or substantially met all milestones toward the YR2 outputs. Table below summarizes achievements in conservation of landraces in CIP-Lima, phytosanitary cleaning of landraces, and repatriation of phytosanitary clean sweetpotato landraces to Zambia and Madagascar.

Indicator	Zambia	Madagascar	Total
# landraces collected and sent to CIP-Lima	260	75*	335
Arrived in Lima in good condition (as of 30 April 2024)	234	70	304
Lost or in poor condition	16	12	28
# landraces phytosanitary clean	27	25	52
# landraces repatriated	22	25	47
# landraces multiplied	16	16	32
# vines distributed	44,750	7,046	51,796
# communities reached	8	11	19
# farmers reached	60		
# female farmers	38		
% female farmers	63%	26%	

*11 lines collected under the BHA-USAID project and 64 landraces collected under the Darwin Clean and Share project.

Output 1. Landraces are collected in partner countries and processed for long-term conservation

- YR2 milestones from Output 1 have been 100% successfully completed.
- 260 sweetpotato landraces have been collected from Zambia (collected under the SFR project). All collected landraces were shipped to CIP-Nairobi where they were placed into *in vitro* culture and a subset of 31 landraces underwent phytosanitary cleaning (thermotherapy and meristem culture) of which 27 were confirmed virus-free by high throughput sequencing of small RNAs (HTS). All 260 landraces were shipped from CIP-Nairobi to CIP-Lima in two shipments for long-term storage. Six landraces (2% of the total collected) unfortunately did not survive repeated shipments and an additional 10 landraces (4% of the total collected) are classified in poor condition and/or with bacterial contamination and these are being closely monitored.
- 75 sweetpotato landraces were collected from Madagascar (11 under the BHA-UADA project and 64 under the Darwin Project) and all have been placed into *in vitro* in CIP-Nairobi and a subset of 29 landraces underwent phytosanitary cleaning (thermotherapy and meristem culture) of which 25 were confirmed virus-free by either HTS or RT-PCR. All landraces were also shipped to CIP-Lima in two shipments for long-term storage of which 70 landraces from Madagascar are still alive at CIP-Lima as of 30 April 2024 yet 7 accessions (10% of the total collected) are in poor condition and/or with bacterial contamination and these are being closely monitored.
- DNA was extracted from leaves of the collected sweetpotato landraces and sent to Diversity Arrays in Australia to generate DArTseq molecular fingerprints for each of the landraces. Analysis revealed that the landraces collected from Madagascar were genetically distinct as a group from those from Zambia (see summary of DArTseq fingerprinting data from sweetpotato landraces collected from Madagascar and Zambia in Annex 4b). Further, there were more distinct groupings of genetically similar landraces from Zambia than from Madagascar, a factor that could be attributed to 3X as many landraces were collected in and analyzed from Zambia than from Madagascar.
- All collected accessions transferred to CIP were transferred with the Standard Material Transfer Agreement (SMTA) of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

Output 2. 30,000 cleaned vines from 25 sweetpotato landraces per country are available for smallholder farmers.

- YR2 milestones from Output 2 have been substantially completed.
- 22 phytosanitary clean landraces were repatriated to Zambia in June 2023 where they underwent acclimatization out of *in vitro* culture and hardening prior to multiplication.
    - 16 of these phytosanitary lines were successfully multiplied by ZARI and 44,750 vines were distributed to smallholder farmers in 8 communities (camps) in Zambia in January 2024.
    - Having only a few multiplication sites is posing a challenge in meeting the minimum number of 48,000 vines. To overcome this, an increase in multiplication sites is proposed in YR3.

- 63% of the vines were distributed to female farmers and 27% of the vines were distributed to male farmers in Zambia.

- 25 phytosanitary clean landraces were repatriated to Madagascar, where they underwent acclimatization out of *in vitro* culture and hardening prior to multiplication.
  - 22 landraces survived and over 7,046 vines were distributed in January and March 2024 by FIFAMANOR from 16 landraces to farmers in 11 communities in Madagascar.
  - Multiplication and vine distribution to farmers was delayed in Madagascar due to drought and cyclones.
  - Multiplication of the landraces is continuing and distribution to farmers will continue through May 2024, after which planting is no longer optimal.
  - 26% of the vines were distributed to female farmers and 74% of the vines were distributed to male farmers in Madagascar.
- Overall, 51,796 sweetpotato vines were distributed from 32 landraces. The vines were distributed in a total of 19 communities (camps in Zambia) to over 100 farming households.
- A questionnaire consisting of 66 questions has been discussed and revised at the monthly project partner meetings during YR2, as well as received input from several social scientists, and version 4 of the questionnaire (Annex 4c) represents a version that all partners are comfortable with using to assess satisfaction in the program from farmer focus groups.

Output 3. Capacity of national genebanks strengthened.

- Monthly project meetings have occurred with all partners participating and where project goals, outcomes, outputs, milestones, progress and needs are discussed as a group.
  - These meetings are used also as a learning tool for the group as in YR2 topics such as DNA markers, clean planting strategies, i*n vitro* culture of plants and shipment and exchange of plant genetics were discussed.
  - Each partner presented a 10-15 minute overview of their organization and program to further educate the team about each other's programs.
  - A module on anti-bribery and corruption policies was presented to ensure team members understood the policies and procedures in the advent of any questions or potential infringement.
- Two 2-hour virtual capacity-building workshops were given, one on DNA marker analysis and the other on on-farm disease management. Links to the videos of the workshop are publicly available.
  - 17 October 2023 - *Virtual Workshop on the Analysis of DArTseq Sweetpotato Marker Data*[1]. 29 participants (52% female) from 11 countries representing NARS, NGOs and universities.
  - 12 December 2023 - *Sweetpotato Viral Disease Management Workshop*[2]. 25 participants (48% female), from 9 countries, representing NARS, NGOs, and a private company.

Output 4. Cryopreservation protocol refined and optimized specifically for sweetpotato diversity

There are no milestones for this output in YR2 yet work has begun to identify landraces and multiply material in preparation of starting cryopreservation experiments in YR3.

3.2 Progress towards project Outputs

All work reported started from a baseline of zero with few to no sweetpotato landraces collected, placed *in vitro* or phytosanitary cleaned from either Madagascar or Zambia.

Output 1, Landraces collected in partner countries and processed for long-term conservation, is 100% successfully completed. Building on the momentum and progress from YR1, this output is substantially complete with landraces collected, put into in vitro, phytosanitary cleaned, genotyped, and shipped to CIP-Lima for long-term conservation under the SMTA of the ITPGRFA. Finally, once

[1] Workshop link: https://drive.google.com/drive/folders/1hZoTqQ-4NojtpTL_DmrPJIXczvgaisuV?usp=share_link

[2] Workshop link available at https://youtu.be/jJFhUSCeWdk?si=6BB3FGkIqIWcnF-Q

released from quarantine, the landraces undergo *in vitro* multiplication in CIP-Lima in preparation for cryopreservation in YR3.

Output 2. 30,000 cleaned vines of 25 sweetpotato landraces available per country to smallholder farmers is also substantially met. Repatriation of the target number of landraces has been done and over 53,000 vines from the phytosanitary clean sweetpotato landraces have been distributed by both country partners with both ZARI and FIFAMANOR planning additional vine distributions yet in 2024. A questionnaire for farmer focus groups has been put together after extensive collaboration with partners and both ZARI and FIFAMANOR have already engaged with farmers in preparation of the farmer focus group meetings. Thus far, farmers are engaged and very optimistic with the distribution of the phytosanitary clean planting materials.

Although all specific milestones in ***Output 3. Capacity of national genebanks strengthened*** have been completed, the capacity building component of this output continues. YR2 had continued capacity building through monthly team meetings and the completion of two well-attended workshops which are available online for continued training.

3.3 Progress towards the project Outcome

As in YR1, the two outcomes for the project remain relevant and there is no need to modify or change them: 1) secure long-term conservation of at risk sweetpotato landraces from Madagascar and Zambia, and 2) increased sweetpotato yields for smallholder farmers. Prior to the initiation of this project there were no projects aimed at the long-term conservation of sweetpotato landraces from Madagascar nor the repatriation of phytosanitary clean sweetpotato landraces aimed at increasing yields to farmers in either country. This project has overseen the successful collection and placement into the global sweetpotato collection, held in-trust for humanity under the ITPGRFA at CIP-Lima, of over 300 sweetpotato landraces from Madagascar and Zambia. This in itself is a huge accomplishment which will have benefits for millennia. A large capacity building effort has been successfully completed through monthly project meetings attended by all partners and two well attended virtual workshops.

The indicators for measuring the outcomes of the project are still very appropriate, 1) a minimum of 25 landraces securely conserved long-term from each of Madagascar and Zambia under the terms of the ITPGRFA and 2) the redistribution of phytosanitary 30,000 clean propagules to at least 60 households per country by the end of the project. Farmer surveys in YR3 of the project will be conducted which will determine farmer satisfaction with phytosanitary clean materials. Cryopreservation will be done wholly in YR3 of the project and work has already commenced with the preparation of plant materials.

3.4 Monitoring of assumptions

Based on progress in YR2, current assumptions for monitoring project progress still apply. There is no need at this time to modify or change assumptions made in the development or design of the project to date.

3.5 Impact: achievement of positive impact on biodiversity and poverty reduction

The stated impact from our original proposal was *Smallholder farmers in Sub-Saharan Africa have long-term access to phytosanitary clean sweetpotato diversity and other clonal crop diversity as a means to address future climate change and other challenges.* While a 3-year project cannot assure long-term access to phytosanitary clean sweetpotato diversity, this project has put in place the necessary components to enable long-term access. A vast amount of diversity important to smallholder farmers in both Madagascar and Zambia has been collected and placed into secure long-term conservation. Current and future access to this diversity is assured by placement of the landraces in the global sweetpotato collection with access guaranteed under the terms of the SMTA from the ITPGRFA. In essence, once prepared, anyone, anywhere in the world, can request this material from CIP-Lima and CIP-Lima is obligated to provide disease-free samples of all these landraces. This includes the smallholder farmers and NARS from the project countries. Further, the project has provided capacity building, knowhow, facilities, equipment, and a proven roadmap for projects such as this one to continue and grow.

The impact on the conservation of sweetpotato biodiversity is invaluable due to collection and fingerprinting of over 300 sweetpotato landraces from these two countries. We know of no other project which has accomplished such a huge effort in biodiversity conservation of a clonal crop in such a short period of time and ensured the collected biodiversity is securely safeguarded in a global genebank for humanity. Further, placement of the collected material under the ITPGRFA, not only helps ensure a commitment for long-term conservation, and that the material is available for use by future generations.

The short-term impact on human development and poverty reduction will be monitored and assessed during YR3 of the project. Farmer surveys will be done at harvest to assess farmer satisfaction for planting disease-free materials. It is anticipated farmers will see an immediate increase in yield and quality from these plantings although exact, statistically sound quantification of this is beyond the timeframe of the project. The project has provided capacity building workshops on how farmers can help lessen disease incidents in these fields which should directly translate into future yield increases. The principal lesson that the project hopes to instill is that the planting of disease-free material and the control of diseases in the field will translate into increased yields which will ultimately provide a better quality of life.

4. Project support to the Conventions, Treaties or Agreements

The activities undertaken in this project conform and support the framework of the national action plans in both countries where collections have taken place (Madagascar's National Strategy and action plan on plant genetic resources for food and agriculture 2018-2025 and Zambia's second national biodiversity strategy and action plan 2015-2025).

Sweetpotato is listed as a crop in Annex 1 of the ITPGRFA and all 300+ sweetpotato landraces transferred to CIP under this project were transferred with the SMTA from the ITPGRFA. Long-term conservation of all collected landraces is being done by inclusion of the collected landraces in the global sweetpotato collection which is held in trust for humanity under the auspices of the ITPGRFA in CIP-Lima. Further, the principal partner for the project from Zambia, Graybill Munkombwe from ZARI, is the country focal point for the ITPGRFA for Zambia and has been in contact with his counterparts from CBD and Nagoya making all relevant parties aware of the project and its goals. In Madagascar, the principal partner for the project, Noroseheno Ralisoa from FIFAMANOR, has been in contact with the country focal point from Madagascar who approved the issuance of the SMTA for the transfer of the sweetpotato landraces with the SMTA.

CIP-Lima manages the global sweetpotato and potato collections held in trust under the ITPGRFA and therefore is a key component of the ITPGRFA. Crop Trust, the primary lead partner for the Darwin contact is also an integral partner to the ITPGRFA.

In summary, all genetic resources used in this project are under the auspices of the ITPGRFA with full knowledge and approval of both Madagascar and Zambia.

5. Project support for multidimensional poverty reduction

The Darwin Initiative underscores that poverty is not solely about the lack of money. It acknowledges the complex challenges faced by impoverished communities, particularly with regards to biodiversity. This project contributes to addressing the following challenges that are linked with causes of poverty, environmental degradation, and biodiversity loss.

- Limited access to resources - such as, clean planting materials (sweetpotato vines)
- Limited access to services - such as, the cleaning of virus-infected planting materials
- The negative impacts of climate change on farm production and livelihoods – we report, for example, how cyclones in Madagascar have affected vine multiplication activities in Y2.

Farmers are the expected beneficiaries and the project started the distribution of clean sweetpotato vines to over 100 farmers in Y2. The work continues in Y3. Expected farm-level impacts include: enhanced and reliable access to clean planting materials, increasing crop diversity options on-farms

in Madagascar and Zambia. The collection of important farmer sweetpotato landraces, placement of these landraces under the auspices of the ITPGRFA for use by humanity for crop improvement, training, and conservation into perpetuity for sustained and continued availability to future generations, are necessary prerequisites to ensure the achievement of farm-level impacts. Sweetpotato is an important subsistence crop in Africa, but the unique diversity of sweetpotato landraces is under threat due to poor conservation efforts. These landraces are disappearing in farmers' fields, which could have negative consequences for food security in the future. The repatriation of disease-free planting materials to farmers, in conjunction with training in disease management, is expected to provide immediate increases in smallholder farm productivity, leading to improved income and food security in rural households.

6. Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board[3].	The project does not have a formal Project Board but rather a project team which meets monthly and which determines the direction of the project. The average proportion of women participating in these meeting is 57%
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[4].	75%: CIP, FIFAMANOR, Crop Trust

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	X
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

A regular topic in our monthly project meetings is ensuring gender equality in all aspects of the project. One indicator we monitored during YR2 of the project was the % of women who received the disease-free sweetpotato vines which were distributed. In Zambia, gender equality by this metric was good with 63% percent of the farmers receiving vines being women. In Madagascar, only 26% of the farmers receiving vines were women. This was explained by our partner by "*The number of women are low at this time of first distribution, firstly because they are still reluctant to innovation, we are still at the multiplication phase for most of the sites.*" This highlights a need for continued effort and focus to ensure gender equality in the future. One plan to help ensure this is to have women-only focus groups where there may not be this limitation and to raise awareness so that they are not so reluctant in the future.

[3] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

[4] Partners that have a formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

Another example of our monitoring of gender during participation in project activities was with our two virtual workshops where we had 52% and 48% of the participants being women in the DArTseq markers data workshop and sweetpotato disease management workshop, respectively.

The collection of gender-specific data during all phases of the project has been important to 1) confirm we have gender-equality and 2) to identify areas where we need to improve. The latter point is highlighted by the less than 50% participation of women in vine distribution in Madagascar and this has been highlighted as an area in need of improvement in YR3.

7. Monitoring and evaluation

All project Outputs and Activities are on schedule and monitored on an ongoing basis via regular emails and monthly virtual project team meetings. In YR2, collecting, shipment to CIP-Nairobi, placement into *in vitro* and disease-cleaning was done and a shipment of landraces collected in the project to CIP-Lima has been completed. All materials were transferred with an SMTA under the auspices of the ITPGRFA. To justify that the products and activities contribute to the results of the project, all local varieties collected, sent, and redistributed, with their characteristics, are directly registered in the project database. Documents, such as the signed SMTA, also document the transfer of plant materials. The list of producers who received the cleaned plant materials will also be directly entered in the database. Achievement indicators include number of local varieties collected, cleaned, repatriated, put into long-term storage (CIP-Lima), number of producers multiplying virus-free local varieties, and number and gender of smallholder farmers who receive and plant the repatriated landraces. Additionally, a database (ODK tool) was used for collected plant characteristics during the collection of landraces.

In Y2, partners were able to agree on the key questions to assess impacts of our program on farmers (Annex 4c). The survey will be conducted among farmers in Y3. As mentioned in 3.2, all activities reported began from a baseline of zero, with minimal to no sweetpotato landraces collected, placed *in vitro*, or subjected to phytosanitary cleaning from either Madagascar or Zambia. A distinct intervention was implemented through this project, and the direct attribution of farm-level impacts to the Darwin Project is evident.

In Y2, Crop Trust visited the project partner, ZARI, in Zambia. During the visit, we were able to see the multiplication field of disease-free vines, which were in very healthy conditions and well maintained. The multiplication site is in a location distant from other sweetpotato fields with limited risks of being contaminated by any diseases that may be present in the field. Site visits are crucial for M&E because they can confirm whether reported activities and outcomes align with the reality on the ground.

The M&E plan has not changed over this reporting period and continues to be useful in ensuring results are achieved on schedule. All partners share the M&E workload through email exchanges and monthly project team meetings, fostering transparency and collaboration for a robust M&E system.

8. Lessons learnt

- Regular and constant communication between the project partners has been critical to ensure timely delivery of activities. This has been done through monthly 1.5-hour teleconferences with all partners participating as well as constant, sometimes daily, correspondence via email.
    - Internet conductivity in partner countries can be problematic but this occurs less than 10% of the time and detailed minutes of the meeting are circulated, with action items assigned to partners, which ensures critical points are conveyed.
    - Time difference between partners (project coordinator on Pacific Standard Time and Madagascar/Nairobi on East Africa Time) requires flexibility in the timing of the meetings; however to date, all partners have provided this flexibility making the project and communication function.
- The 3-year project duration and very rapid ramp up time from project approval to project initiation is suboptimal and allows little time for adjustments in delays of deliverables. Because

the project is dealing with living biological materials, seasonality for collections, multiplication of planting materials, planting and data collection are all very time-sensitive. Despite this, the project was only slightly delayed at the end of YR1 and virtually all activities were caught up during YR2.
    - Constant communication has been critical in monitoring all critical points with partners and to date all partners are ready and willing to meet deliverables.
    - Weather is one unknown for planting and the project is based on “normal” weather (seasonal rains and dry period) although this remains a variable. In YR2, cyclones prevented the project team from travelling to the south of Madagascar which necessitated a change in multiplication sites and a delay in distribution of critical materials to the affected areas. While we do not anticipate any impact on overall project deliverables, this does certainly impact the timing of activities by FIFAMANOR in Madagascar as well as distribution of vines in YR2 in the south.
- The fall of the UK£ relative to the US$ during this first year of the project caused a significant (11%) reduction in project funds. This was particularly hard on partners in Madagascar and Zambia who were relying 100% on funds from this project to meet deliverables.
    - Flexibility in budgets and deliverables is critical in any project design and planning and in the case of this project, the change in the exchange rate was handled by a decrease in vines produced and households receiving vines with no impact to date on capacity building for partners in Madagascar or Zambia.
    - The ability to maintain the projected level of capacity building in partner countries is critical for long-term impact within Madagascar and Zambia to allow infrastructure for continued awareness and ability for genetic resources conservation.
- Remote training for the preparation of material for DNA fingerprinting is difficult and direct hands-on training would have been a preferred method.
    - Although drying plant material on silica gel for DNA extraction is common practice for those skilled in the art, the need for capacity building and training for the preparation of plant material for DNA extraction was not adequately appreciated.
    - In the future, capacity building for drying leaf material for molecular analysis needs to begin earlier in the project period and not taken for granted that the partners have the knowledge or capacity.
- Direct transport (hand-carrying) of collected plant genetic resources is preferred within the African continent to use of a courier service such as DHL or FedEx.
    - For one partner country (Zambia) a direct courier could not be found to transport the living plant material. If this was known prior to the initiation of the project, this would have avoided delays in trying to work with the courier companies and also in facilitating and planning better for opportunistic hand-carrying of the plant materials to Kenya.
- Coordination with other projects such as SFR and BHA-USAID was critical and greatly benefitted the collection of the local varieties.
    - Prior knowledge of such programs operating in partner countries is a must for future projects to ensure timely success in achieving deliverables.
- In future projects such as this, a longer ramp-up time and longer project time period should be considered.
    - This would allow better pre-scouting of collection sites to both identify partner institutions with which the farmers are familiar and the education of the farmers for the project goals and need for long-term conservation of their native varieties.

9. Actions taken in response to previous reviews

In last year's report, reviewers recommended including a table to improve clarity regarding the number of landraces collected, transported, cleaned, and repatriated. To address this feedback, a table summarizing these figures is now included in section 3.1. Additionally, a breakdown of these outputs by country is provided in Annex 1.

The reviewers also recommended strengthening the MEL plan to capture the positive impacts on food security and income. In YR2, we engaged partners in the development of a survey instrument aimed at assessing the impacts of virus-free sweetpotato vines in farming communities. We will be interviewing farmers in YR3 to explore how the provision of disease-free planting stock of preferred landraces could lead to yield gains and improvements in agronomic practices.

10. Risk Management

During monthly meetings, partners are able to share challenges in project implementation. The main issues and lessons learned include:

- The need for a facilitated transport system for plant genetic resources to a central hub in Africa where material can be placed into *in vitro* for repatriation to farmers and shipment to CIP-Lima for long-term conservation.
- The involvement of local communities during the collection of local varieties is very important, it is necessary to have key people in each area and even in each locality.
- There is a sensitivity for farmers to give up their landraces, which they have nurtured and protected for generations. Often the concept of long-term conservation in a distant land is new and strange. Therefore, careful explanation and understanding is needed to ensure prior informed (PIC) consent is obtained.
- Shipping materials within Africa is problematic. For example, no courier could be found to ship plant materials out of Zambia which necessitated Zambian sweetpotato landraces to be hand-carried to Kenya. Thus, material was delayed due to waiting until someone was travelling and could hand carry the material. A similar challenge was encountered in Madagascar.
- Delays in the collection of materials and issues with timely shipping of materials to Kenya have put pressure on the project as there is a small window when planting can be done.
- Finding the right contact to introduce the lead partners to the communities or farmers is key, as is an explanation by a trusted individual that the resources will be returned to their source areas.
- Ensuring project materials are in the local language so that instructions can be understood is important.
- Natural disasters, such as cyclones in Madagascar during 2024, are common occurrences which must be taken into consideration when planning. Contingency plans and flexibility are critical.
- Procurement of capital equipment can be problematic.
- Regular partner meetings enhance communication and project coordination.

11. Sustainability and legacy

The project is progressing according to schedule. Hence, there is no need to adjust the long-term or exit strategy. This success is evidenced by both partner countries exceeding expectations by collecting more sweetpotato landraces than initially required. This proactive approach demonstrates their commitment to the project's goal of long-term genetic resource conservation. The project holds significant value for governments and potential donors, as it aims to improve sweetpotato productivity in regions facing extreme weather events, a crucial factor for food security. The project will serve as a model for both countries, providing tangible evidence to encourage the adoption of disease-free sweetpotato planting materials among farmers. Furthermore, by documenting and disseminating project outcomes through multimedia, we can raise awareness of the benefits of virus-cleaned sweetpotato vines in communities outside the project area, a lasting legacy that will continue to benefit farmers long after the project concludes.

12. Darwin Initiative identity

The Crop Trust website has a dedicated webpage for this project, recognizing the UK Government's Darwin Initiative as a supporter of this project. To publicize the Darwin Initiative project, partners are regularly reminded to use the Darwin Initiative and Crop Trust logos in related publications, presentations, and events.

CIP has been promoting the Darwin Project to visitors at the CIP genebank in Lima, which has been a very efficient strategy to promote the importance of long-term conservation of sweetpotato diversity and linkages with farmers. The key communication messages relate to strengthening partnerships, enhancing collaboration with NARS, and promoting capacity building and repatriation of clean planting materials to farmers.

The Crop Trust's communications team additionally supported the project and publicize the Darwin Initiative as follows:

- Promotion of a GROW webinar featuring Dr Dave Ellis, which mentions the Darwin project and other cryopreservation initiatives as part of the Global Plant Cryopreservation Initiative. The YouTube video was shared on the Crop Trust website and social media.
- An interview with Dave Ellis was posted on the website and shared on social media to further promote the GROW webinar.
- An 2022 Annual Report mini-website was published in June 2023 https://report.croptrust.org/2022/our-work/a-chill-solution-for-tomorrows-sweetpotatoes/. A printed summary was distributed to all staff and Global Crop Diversity Summit (GCDS) attendees in November 2023.
- For the GCDS, posters about the activities of the Darwin project partners, ZARI, and CIP were created.
- Social media outreach and engagement:
    - July 2023:
        - https://x.com/CropTrust/status/1676162691507863552?s=20
        - https://www.facebook.com/photo?fbid=653301193495960&set=a.550092473816833
        - https://www.linkedin.com/posts/croptrust_a-new-project-from-2022-the-sweetpotato-activity-7083736144340770817-7ttr?utm_source=share&utm_medium=member_desktop.
    - In January, we posted a sweetpotato photo on Facebook linking back to the blog Chill Solution for Meeting Future Demand of Sweetpotato. The post got 5,134 impressions, 146 likes, 6 comments and 18 shares.
    - In March, our Director of Programs, Sarada Krishnan, visited ZARI and posted photos about the project's partnership activities on Twitter and LinkedIn, which were reshared from the Crop Trust's social media accounts on X and LinkedIn.
- Work is underway to prepare the 2023 Crop Trust Annual Report, which will include a story about the project and associated social media content.

13. Safeguarding

We aim to provide partners with virtual learning opportunities on safeguarding topics in Y3.

14. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2023 – 31 March 2024)

Project spend (indicative) since last Annual Report	2023/24 Grant (£)	2023/24 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below	[redacted]	[redacted]	[redacted]	FIFAMANOR: Planned vine multiplication mission in the Southeast was postponed due to a cyclone passage.
Consultancy costs				
Overhead Costs				Reduced due to overall underspending within the project
Travel and subsistenc				FIFAMANOR: incurred reduced travel and subsistence expenses due to the postponed multiplication mission.
Operating Costs				FIFAMANOR: Planned vine multiplication delayed due to cyclone led to low operating costs.
Capital items (see below)				Planned purchase of laboratory equipment could not be completed as potential suppliers could not deliver before March 31.
Others (see below)				Due to the postponed mission, FIFAMOR has not utilised the budget for supplies for distribution.
TOTAL	**221,508**	**177,300**	**20**	

Table 2: Project mobilised or matched funding during the reporting period (1 April 2023 – 31 March 2024)

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£)	[redacted]	[redacted]	
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)			

15. Other comments on progress not covered elsewhere

N/A

16. Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes.

I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes.

The Darwin Initiative project, *Sweetpotato, a model for food-security and long-term conservation of biodiversity*, has had a huge impact in the two years of the project. Riding on the coattails of the Seeds for Resilience (SFR) project in Zambia and the USAID Bureau for Humanitarian Assistance (BHA) project in Madagascar, the Zambian Agricultural Research Institute coordinated the collection of 260 sweetpotato landraces in Zambia, while Fiompiana Fambolena Malagasy Norvéziana (FIFAMANOR) collected 75 sweetpotato landraces from six regions in Madagascar. After collection, vines from the collected landraces were shipped to the International Potato Center (CIP) facilities situated at the Kenya Plant Health Inspectorate Service (KEPHIS) station in Nairobi where the landraces were isolated into *in vitro* culture and a subset underwent phytosanitary cleaning (thermotherapy and meristem isolation). 25 and 22 disease-free landraces were repatriated to Madagascar and Zambia, respectively, for multiplication and distribution to farmers. Cyclones disrupted multiplication and distribution in parts of Madagascar, however as of the end of April 2024, 7,046 vines were distributed by FIFAMANOR from 16 landraces to farmers in eleven communities in Madagascar. In Zambia, 44,750 vines were distributed from 16 landraces to smallholder farmers in 8 communities (camps). All collected landraces were fingerprinted using DArTseq markers which revealed that the landraces from the two countries are genetically distinct from one another. All landraces were transferred under the Standard Material Transfer Agreement (SMTA) from the international Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and shipped to CIP-Lima for secure long-term conservation and incorporation into the global sweetpotato collection which is held in trust for use by humanity under the auspices of the ITPGRFA. Long-term conservation of the landraces in cryopreservation will be done at CIP-Lima under the Global Plant Cryopreservation Initiative. The project also completed significant capacity-building activities which included two workshops (*Virtual Workshop on the Analysis of DArTseq Sweetpotato Marker Data* and *Sweetpotato Viral Disease Management Workshop)* which are available online for continued training. Overall, the project is on schedule, is meeting its goals and is having a significant impact on the conservation of sweetpotato diversity from these countries and in enhancing the wellbeing of smallholder farmers with the availability of disease-free planting materials.

Image, Video or Graphics

File Type (Image / Video / Graphic)	File Name or File Location	Caption including description, country and credit	Social media accounts and websites to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
Video	https://youtu.be/jJFhUSCeWdk?si=6BB3FGkIqIWcnF-Q	Sweetpotato Viral Disease Management Workshop		Yes
Video	https://drive.google.com/drive/folders/1hZoTqQ-4NojtpTL_DmrPJIXczvgaisuV?usp=share_link	Virtual Workshop on the Analysis of DArTseq Sweetpotato Marker Data		Yes
Graphic	https://croptrust.box.com/s/j4cxwd0mnph8370yqeji2xidtonoqdmn	Summary of DArTseq fingerprinting data from sweetpotato landraces collected from Madagascar and Zambia as part of the Darwin Initiative project entitled *Sweet potato, a model for food-security and long-term conservation of biodiversity*		Yes
Image	https://croptrust.box.com/s/17kyf5szxdx8lyzl8xuwk72briup0fu7	Photos of the materials that arrived in CIP-Lima in January 2024.		Yes
	https://croptrust.box.com/s/gcsr2982mgprf92ydey7fjc70b0y063i	Volatiana and Francois, (a couple), farmer vine multipliers in Mahavokatra Ambatolampy (a village located in the Central Highlands of Madagascar), proudly show how much they care for the new vines.		Yes
Image	https://croptrust.box.com/s/remmxcoj3qmygflz0wfrf64jotzx5pwt	Mrs Rajaonarivony, a vine multiplier, in her multiplication site in Ampamelomana Betafo in the Highlands of Madagascar.		Yes
Image	https://croptrust.box.com/s/n9jl4pa6349blkmibrnibuznwm447sj3	Multiplication of landraces. Here, the variety Mavelogaogna is ready to be distributed, in the screenhouse at FIFAMANOR.		Yes
Image	https://croptrust.box.com/s/79bcc6g0fc52437qr2hfdyaga9m9tler	Delivery of sweet potato vines to farmers in Masaiti District, Zambia (January 2024).		Yes
Image	https://croptrust.box.com/s/ovrj53oebodorbxyp0k7s045z01gfizp	Delivery of sweet potato vines to a female farmer in Masaiti District, Zambia (January 2024).		Yes
Image	https://croptrust.box.com/s/yaq436xp7m3raswet4flhu575o1ixumv	Farmer showcasing her virus free sweet potato field in Kapiri District, Zambia (March 2024).		Yes
Image	https://croptrust.box.com/s/qjz6z2uj4c7oxry9myy6ixw5zqvdk81i	Farmer showcasing her virus free sweet potato field in Masaiti District Zambia (March 2024).		Yes

Image	https://croptrust.box.com/s/r9gx3cqb29nmd0hi3qwxyqwg02ta4kij	Vine multiplication at ZARI (December 2023)		Yes
Image	https://croptrust.box.com/s/h385xj0pmolpg0d8rqd0yk3dc73i9sdv	Multiplication field at ZARI		Yes
Image	https://croptrust.box.com/s/0dvj0e5bigedwr8r5v9yrgbcjdk10ocp	Dr. Graybill Munkombwe and Dr. Rabson Mulenga at the multiplication field at ZARI		Yes
Image	https://croptrust.box.com/s/ygkk29orqyytshsejwmhtwyrgdop933r	Multiplication field enclosure at ZARI		Yes
Image	https://croptrust.box.com/s/bw0q1oyewyedl1u7f3meh02mtasz6a20	Darwin project activity page in the printed summary of the 2022 Crop Trust Annual Report		Yes

Annex 1: Report of progress and achievements against logframe for Financial Year 2023-2024

Project Summary	Smart Indicators	Progress and Achievements April 2022 - March 2023	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
Impact:				
Smallholder farmers in Sub-Saharan Africa have long-term access to phytosanitary clean sweetpotato diversity and other clonal crop diversity as a means to address future climate change and other challenges		The first phase of the project - collection and phytosanitary cleaning of landraces - has been successfully accomplished. This is a significant positive impact on biodiversity as it ensures the long-term conservation of this genetic diversity for future generations. Although the most significant positive impacts on smallholder farmers in Madagascar and Zambia is yet to be realized, the collection of these landraces raised awareness in the farming communities of the value of the genetic diversity in their fields as well the value of maintaining their landraces to ensure sustainable farm productivity.	During the current reporting period, a total of 51,796 sweetpotato vines were distributed to over 100 farmers in Zambia and Madagascar. Ensuring the availability of phytosanitary clean plant genetic resources within farming communities is essential for achieving positive impacts in poverty reduction, food security, and climate change adaptation. Zambia: 44,750 vines to 60 farmers Madagascar: 7,046	Farmer survey to assess the use and impacts of repatriated sweetpotato vines will be conducted in Y3
Outcome:				
Increased sweetpotato yields for smallholder farmers in Zambia and Madagascar as part of a "Clean & Share " approach to conserve, and provide clean planting material, of RTB diversity.	0.1 By the end of the project, sweetpotato yields have increased 20% for farmers that received clean planting material for 50 high-value sweetpotato landraces	This is in process and expected to be confirmed prior to the end of the project.	This is in process and expected to be confirmed by the end of the project. As of the reporting period, 47 landraces were repatriated and 32 landraces were multiplied for distribution. Zambia: 22 landraces repatriated and 16 multiplied Madagascar: 25 landraces repatriated and 16 multiplied	Farmer survey to assess the impact on production and livelihood of smallholder farmers will be conducted in Y3.
	0.2 The "Clean & Share" conservation approach and its potential application to other countries or clonal crops documented and broadcast	This is in process and expected to be documented prior to the end of the project.	2 online training workshops were conducted by CIP on viral disease management and on the analysis of DArTseq marker data	This activity is ongoing, and a final report on communications and outreach will be completed in Y3.

Project Summary	Smart Indicators	Progress and Achievements April 2022 - March 2023	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
Outputs:				
1. 50 sweetpotato landraces from partner countries are processed for long-term conservation in the global sweetpotato collection at CIP in Lima, Peru	By the end of the project phytosanitary clean planting material from 50 landraces will be planted by small holder farmers and 20 of these landraces will be in long-term secure conservation in the CIP-Lima cryobank.	All indicators remain relevant and achieving the indicators on a project basis is on schedule.	Substantially accomplished and will be confirmed by the end of the project. As of the reporting period, 335 landraces were sent to CIP-Lima for long-term conservation. 47 landraces were repatriated and 32 landraces were multiplied for distribution. Zambia: 260 landraces sent to CIP-Lima. 22 repatriated and 16 multiplied Madagascar: 75 landraces sent to CIP-Lima. 25 repatriated and 16 multiplied	Multiplication and distribution to farmers is continuing through mid-2024.
	1.1 By the end of year 1, 60 sweetpotato landraces are selected and collected in Zambia and Madagascar	1.1 Successfully and fully accomplished.	1.1 Successfully and fully accomplished. 335 landraces were collected in Zambia and Madagascar Zambia: 260 landraces were shipped to CIP-Lima and 234 are still alive in CIP-Lima as of 30 April 2024. Madagascar: 75 landraces were shipped to CIP-Lima and 70 are still alive in CIP-Lima as of 30 April 2024.	
	1.2 By the end of year 2, 60 sweetpotato landraces are genetically characterised	1.2 Initiated, ongoing and on schedule.	1.2 Successfully and fully accomplished. All collected landraces were fingerprinted using DArTseq markers.	
	1.3 By the end of year 1, 50 sweetpotato landraces are cleaned of yield-limiting viruses and other pathogens at KEPHIS, Kenya	1.3 Substantially accomplished, awaiting confirmation of phytosanitary cleaning	1.3 Successfully and fully accomplished. 52 landraces are phytosanitary clean. Zambia: 27 landraces are phytosanitary clean Madagascar: 25 landraces are phytosanitary clean	
	1.4 By the end of year 1, 50 sweetpotato landraces are shipped to CIP-Lima for processing into the collection and ultimately for cryopreservation in the global collection at CIP-Lima.	1.4 Shipment of 50 sweetpotato landraces successfully and fully accomplished.	1.4 Substantially accomplished. 335 landraces were sent to CIP-Lima and are currently being processed for long-term conservation. Zambia: 260 landraces sent to CIP-Lima	

Project Summary	Smart Indicators	Progress and Achievements April 2022 - March 2023	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
			Madagascar: 75 landraces sent to CIP-Lima	
2. 60,000 cleaned vines (planting materials) of 50 sweetpotato landraces are made available to smallholder households in Zambia and Madagascar	By the end of the project 60,000 phytosanitary clean vines will be distributed to and planted by small holder farmers in Zambia and Madagascar.	All indicators remain relevant and achieving the indicators on a project basis is on schedule. *In vitro* cultures of a limited number of landraces have been successfully repatriated to Madagascar and a shipment is pending for repatriation of material to Zambia. Vine multiplication and distribution to farmers will occur in YR2.	Substantially accomplished and will be confirmed by the end of the project. As of the reporting period, 51,796 vines were multiplied for distribution. Zambia: 44,750 vines were multiplied Madagascar: 7,046 vines were multiplied	Multiplication and distribution to farmers is continuing through mid-2024.
	2.1 By July 2023, Vine multipliers in Zambia and Madagascar receive 10+ clean cuttings/*in vitro* plants of 25 landraces from CIP-Kenya for multiplication and multiply them to 1200 samples per landrace	2.1 Distribution of *in vitro* material has started, and everything remains on schedule.	2.1 Successfully and fully accomplished. 51,796 vines were multiplied from 32 landraces. Zambia: 44,750 vines from 16 landraces Madagascar: 7,046 vines from 16 landraces	
	2.2 By December 2023, 60,000 sweetpotato disease-free vines distributed to a minimum of 120 farmer households	2.2 As for 2.1, distribution of *in vitro* material has started, farmers are being identified and everything remains on schedule.	2.2 Substantially accomplished. 51,796 vines were distributed to over 60 households. Zambia: 44,750 vines to 60 farmers Madagascar: 7,046	
	2.3 By the end of the project, yield data and focus group data are collected and summarized	2.3 Partners are identifying communities to work with, everything remains on schedule.	2.3 In progress. 19 communities were reached. Data will be summarized in Y3. Zambia: 8 communities. Madagascar: 11	Farmer survey to be conducted in Y3.

Project Summary	Smart Indicators	Progress and Achievements April 2022 - March 2023	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
3. Capacity of national genebanks in Zambia and Madagascar strengthened to conserve diversity and support its use by farmers	Where applicable, tissue culture facilities for each partner will be operational and multiplication of disease-free vines will be operational.	Equipment has been purchased by Zambia and the process is ongoing and on schedule for the capacity strengthening. Madagascar was delayed in the purchase of equipment due to unforeseen circumstances. A change order was submitted, which was approved on 27 April 2023. With this approval, equipment will be purchased as soon as possible.	Madagascar built a greenhouse and procured one tablet and one air-conditioning unit.	
	3.1 By the end of the project, National genebanks in Zambia and Madagascar are strengthened through bi-monthly project meetings and three workshops on 1) conservation techniques, 2) analysis of molecular data and 3) assessment of benefits at the farmer level	3.1 Monthly project meetings have been ongoing since the project inception. Workshops are planned and on schedule.	3.1 Monthly project meetings have been ongoing since the project inception. Two workshops were completed during the reporting period on 1) disease management and 2) DArTseq marker analysis	Training on Safeguarding will be provided in Y3.
	3.2 By December 2023, Vine multipliers, NARS and farmers in Zambia and Madagascar received training on disease recognition, disease management, and multiplication of clean planting material	3.2 Report completed on progress of activities that contribute toward achieving this Output	3.2 Successfully and fully accomplished. Partners have been multiplying vines for distribution.	
4. Cryopreservation protocol refined and optimized specifically for sweetpotato diversity	Robust cryopreservation system for sweetpotato developed as evidenced by the cryopreservation of 20 sweetpotato landraces from the project.	Methodology development for sweetpotato cryopreservation is ongoing and making excellent progress. Everything is on schedule.	Methodology development for sweetpotato cryopreservation is ongoing and making excellent progress. Ongoing and on schedule	Ongoing work
	4.1 By the end of the project, experiments to improve cryopreservation protocol for sweetpotato undertaken	4.1 Experiments in sweetpotato cryopreservation are ongoing.	4.1 Experiments in sweetpotato cryopreservation are ongoing.	
	4.2 By the end of the project, protocol pilot tested on 20 sweetpotato accessions	4.2 Ongoing and on schedule	4.2 Ongoing and on schedule	

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions
Impact:			
Smallholder farmers in Sub-Saharan Africa have long-term access to phytosanitary clean sweetpotato diversity and other clonal crop diversity as a means to address future climate change and other challenges			
Outcome:			
Increased sweetpotato yields for smallholder farmers in Zambia and Madagascar as part of a "Clean & Share " approach to conserve, and provide clean planting material, of RTB diversity.	0.1 By the end of the project, sweetpotato yields have increased 20% for farmers that received clean planting material for 50 high-value sweetpotato landraces	0.1 Yield data gathered from farmers' groups and NARS experimental plots	Long-term conservation (cryopreservation) protocols are sufficiently effective
	0.2 The "Clean & Share" conservation approach and its potential application to other countries or clonal crops documented and broadcast	0.2 Publications, presentations and workshops on the reciprocal conservation approach Plant Treaty's Global Information System lists new sweetpotato landrace accessions available worldwide for research, breeding and training	Working conditions and travel remain sufficiently flexible for project implementation in project countries
Outputs:			
1. 50 sweetpotato landraces from partner countries are processed for long-term conservation in the global sweetpotato collection at CIP in Lima, Peru	1.1 By the end of year 1, 60 sweetpotato landraces are selected and collected in Zambia and Madagascar	1.1 Images, reports, delivery of accessions in Kenya	All collected landraces have minimum passport data associated with them required for assigning DOIs. *To this end, we will ensure that partners assume accountability for obtaining this information*
	1.2 By the end of year 2, 60 sweetpotato landraces are genetically characterised	1.2 Data provided as part of reports and/or science papers	Countries transfer the landraces with a standard material transfer agreement. *In discussions with partners we have been assured that this will not be an issue*.
	1.3 By the end of year 1, 50 sweetpotato landraces are cleaned of yield-limiting viruses and other pathogens at KEPHIS, Kenya	1.3 Phytosanitary and import permits, confirmation of disease-free status at CIP	Not all landraces adapt quickly to *in vitro* culture and some are problematic for phytosanitary cleaning (need 2 or more rounds of cleaning). Thus, the number collected is 5 landraces more than the target of 25 landraces repatriation to ensure success with deliverables.
	1.4 By the end of year 1, 50 sweetpotato landraces are shipped to CIP-Lima for processing into the collection and ultimately for cryopreservation in the global collection at CIP-Lima.	1.4 New accessions are reported via the online portal, Genesys (www.genesys-pgr.org, and through assignment of digital object identifiers to each accession in the Plant Treaty's Global Information System	Sweetpotato materials are successfully imported to Peru without losses. *Advances in successful shipments from Kenya to Peru have progressed over the past couple of years and most recently we have developed a system that ensures success by improved packaging and*

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions
			communication with Peru's phytosanitary authority.
2. 60,000 cleaned vines (planting materials) of 50 sweetpotato landraces are made available to smallholder households in Zambia and Madagascar	2.1 By July 2023, Vine multipliers in Zambia and Madagascar receive 10+ clean cuttings/*in vitro* plants of 25 landraces from CIP-Kenya for multiplication and multiply them to 1600 samples per landrace	2.1 Import permits, images, reports	Experienced vine multipliers are identified and willing to collaborate. *Several vine multipliers have already been identified in each country so that we have several options.*
	2.2 By December 2023, 60,000 sweetpotato disease-free vines distributed to a minimum of 120 farmer households	2.2 Data and images gathered on cleaned vines at multiplication sites	Small-holder households are organized to receive and plant disease-free materials. *We will start the organization of farmers with advance printed announcements of the availability of clean planting materials*
	2.3 By the end of the project, yield data and focus group data are collected and summarized	2.3 Data collected from small focus groups to assess satisfaction, opinions and suggestions of farmers	Field conditions are conducive for growing material and there are no major abnormal climatic occurrences.
3. Capacity of national genebanks in Zambia and Madagascar strengthened to conserve diversity and support its use by farmers	3.1 By the end of the project, National genebanks in Zambia and Madagascar are strengthened through bi-monthly project meetings and three workshops on 1) conservation techniques, 2) analysis of molecular data and assessment of benefits at the farmer level	3.1 Workshop reports and photos, Training materials made available online	NARS or NGOs in target countries organize appropriate, gender-balanced participation for capacity building events and knowledge is put to use
	3.2 By December 2023, Vine multipliers, NARS and farmers in Zambia and Madagascar receive training on disease recognition, disease management, and multiplication of clean planting material	3.2 Screenhouses, equipment installed, training reports	
4. Cryopreservation protocol refined and optimized specifically for sweetpotato diversity	4.1 By the end of the project, Experiments to improve cryopreservation protocol for sweetpotato undertaken	4.1 Workplans, reports with raw data	Complementary research on cryopreservation at CIP and other CGIAR Centres is supported and under way.
	4.2 By the end of the project, Protocol pilot tested on 20 sweetpotato accessions	4.2 Improved sweetpotato cryopreservation success rates documented and reported	

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
	People who attended the farmer training in Zambia on sweetpotato production and practices. *Country included: Zambia*	Number of farmers from Zambia who attended training on sweetpotato production and practices	People	Men Women	25 35	0		60	100
	People who attended the monthly virtual project team meetings. The meetings cover activities actively ongoing + preparation for future activities to ensure the project is on schedule. Each meeting contains discussions to build understanding and awareness of all partners in technologies used and needed. *Countries included: Kenya, Peru, Germany, Madagascar, and Zambia*	Number of project staff who attended the monthly virtual project team meetings since the project started (total of 21 meetings as of 30 April 2024)	People	Men Women	48 78	48 78		252*	300
	People trained in the methodology for *in vitro* rapid multiplication of sweetpotato in liquid. *Countries included: Kenya, Peru*	Number of project staff who received capacity building in *in vitro* sweetpotato multiplication in liquid	People	Men Women	1 1	0		2	2
	FIFAMANOR staff trained on the use of ODK tool for sweetpotato landrace collection on 8 August 2022. *Country included: Madagascar.*	Number of FIFAMANOR staff trained on the use of ODK tool for sweetpotato landrace collection	People	Men Women	4 2	0		6	6
	Photography workshop participants trained in documenting their work and project efforts visually. *Countries included: Kenya, Peru, Germany, Madagascar, and Zambia*	Number of project staff who attended the photography workshop	People	Men Women	2 4	0		6	6
	Participants trained on the analysis of DArTseq sweetpotato marker data. 9 countries included	Number of participants who attended the DArTseq analysis workshop	People	Men Women		13 13		26	26
	Participants trained on sweetpotato disease management. 9 countries included	Number of participants who attended the sweetpotato disease management workshop	People	Men Women		15 10		25	25
	People trained on the hardening of sweetpotato *in vitro* plantlets *Countries included: Zambia, Kenya*	Number of participants trained on the hardening of sweetpotato *in vitro* plantlets	People	Men Women		3 2		5	5

*We only had 10-15 people at each project meeting and they were mostly the same attendees at every meeting.

Note: No publications were reported by partners in the current reporting period.

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	Yes
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	n/a
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see Section 16)?	Yes
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	