Applicant: **Lin, Jessica**
Organisation: **World Vegetable Center**

DIR25S2\100077

Traditional African vegetables strengthen food and nutrition security in Madagascar

This project aims to secure benefits of agro-biodiversity for poor farmer households in two vegetable production regions in Madagascar: Itasy and Antsirabe. First, the project will protect genetic resources of traditional vegetables through ex-situ and on-farm conservation. Second, the project will support Malagasy women farmers with practise-oriented research and quality-seed production to grow promising varieties of traditional vegetables. This will make farming systems more climate-resilient, secure increased income for women farmers, and improve food and nutrition security of Malagasy households.

PRIMARY APPLICANT DETAILS

Title	Ms
Name	Jessica
Surname	Lin
Organisation	World Vegetable Center
Tel (Work)	
Email (Work)	
Address	

Section 1 - Contact Details

PRIMARY APPLICANT DETAILS

Title	Ms
Name	Jessica
Surname	Lin
Organisation	World Vegetable Center
Tel (Work)	
Email (Work)	
Address	

GMS ORGANISATION

Type	**Organisation**
Name	World Vegetable Center
Phone	
Email	
Website	
Address	

Section 2 - Title, Dates & Budget Summary

Q3. Project title:

Traditional African vegetables strengthen food and nutrition security in Madagascar

What was your Stage 1 reference number? e.g. DIR25S1\100123

DIR25S1\100486

Q4. Country(ies)

Which eligible country(ies) will your project be working in? Where there are more than 4 countries that your project will be working in, please add more boxes using the selection option below.

Country 1	Madagascar	**Country 2**	*No Response*
Country 3	*No Response*	**Country 4**	*No Response*

Do you require more fields?

⊙ No

Q5. Project dates

Start date:	End date:	Duration (e.g. 2 years, 3 months):
01 April 2019	31 March 2022	3 years

Q6. Budget summary

Year:	2019/20	2020/21	2021/22	Total request
Amount:	£98,267.00	£111,347.00	£110,186.00	£ 319,800.00

Q6a. Do you have proposed matched funding arrangements?

⊙ Yes

What matched funding arrangements are proposed?

Matched funds to cover the genebank activities including storage, seed multiplication, morphological characterization, and information management have been identified, however it cannot yet be secured because these funds are confirmed and allocated on a year-by-year basis by BMZ, the core donor of the WorldVeg genebank in Arusha Tanzania.

Q6b. Proposed (confirmed and unconfirmed) co-financing as % of total project cost	8%

Section 3 - Project Summary

Q7. Summary of project

Please provide a brief summary of your project, its aims, and the key activities you plan on undertaking. Please note that if you are successful, this wording may be used by Defra in communications e.g. as a short description of the project on GOV.UK. Please write this summary for a non-technical audience.

This project aims to secure benefits of agro-biodiversity for poor farmer households in two vegetable production regions in Madagascar: Itasy and Antsirabe. First, the project will protect genetic resources of traditional vegetables through ex-situ and on-farm conservation. Second, the project will support Malagasy women farmers with practise-oriented research and quality-seed production to grow promising varieties of traditional vegetables. This will make farming systems more climate-resilient, secure increased income for

women farmers, and improve food and nutrition security of Malagasy households.

Section 4 - Lead Organisation Summary

Q8. Lead organisation summary

Has your organisation been awarded a Darwin Initiative award before (for the purposes of this question, being a partner does not count)?

⊙ Yes

If yes, please provide details of the most recent awards (up to 6 examples).

Reference No	Project Leader	Title
DARSC182	Tsvetelina Stoilova	Utilizing biodiversity of traditional African vegetable species in Madagascar
No Response	*No Response*	*No Response*
No Response	*No Response*	*No Response*
No Response	*No Response*	*No Response*
No Response	*No Response*	*No Response*
No Response	*No Response*	*No Response*
Have you provided the requested signed audited/independently examined accounts? If you select "yes" you will be able to upload these. Note that this is not required from Government Agencies.	⊙ Yes	

Section 5 - Project Partners

Q9. Project partners

Please list all the partners involved (including the Lead Organisation) and explain their roles and responsibilities in the project. Describe the extent of their involvement at all stages, including project development.

This section should illustrate the capacity of partners to be involved in the project. Please provide Letters of Support for each partner or explain why this has not been included.

N.B. There is a file upload button at the bottom of this page for the upload of a cover letter (if applicable) and all letters of support.

Lead Organisation name:	World Vegetable Center
Website address:	https://avrdc.org/
Details (including roles and responsibilities and capacity to engage with the project):	WorldVeg leads the project and is involved in capacity development of researchers, extension workers, women farmers, and MSc students. WorldVeg will collaborate with FOFIFA in germplasm collection and characterization, and will be responsible for ex-situ conservation of Malagasy vegetable landraces in its public genebank of traditional vegetables in Tanzania. WorldVeg will also be responsible for the seed multiplication of promising varieties of traditional varieties in collaboration with FOFIFA. Finally, WorldVeg will be responsible for monitoring and evaluation, supervise the agro-biodiversity four-cell assessments, and participate in the development of an agro-biodiversity catalogue for primary schools
Have you included a Letter of Support from this organisation?	⊙ Yes
Have you provided a cover letter to address your Stage 1 feedback?	⊙ Yes

Do you have partners involved in the Project?

⊙ Yes

1. Partner Name:	FOFIFA
Website address:	http://www.fofifa.mg/
Details (including roles and responsibilities and capacity to engage with the project):	FOFIFA will support capacity development and participatory evaluation with at least 200 women farmers, 25 extension workers, and at least 10 progressive women farmers in poor communities in the Itasy and Antsirabe regions. FOFIFA will further be responsible for inclusion of local food plant diversity in school gardens, participatory evaluation of promising traditional vegetables, and participate in germplasm collection. FOFIFA will organize with support of WorldVeg a conference on how to incorporate traditional vegetables and threatened food plants in regional school garden programs to raise awareness about these food plants, maintain them in school gardens, and promote their use.
Have you included a Letter of Support from this organisation?	⊙ Yes

2. Partner Name:	University of Antananarivo
Website address:	http://www.univ-antananarivo.mg/
Details (including roles and responsibilities and capacity to engage with the project):	The University of Antananarivo (UA) will collaborate in the agro-biodiversity four-cell assessments, seed network analyses to assess conservation and use of traditional vegetables and other food plants. The assessments will help to identify popular traditional vegetables that are promising for further promotion and commercialization as well as vegetables and other food plants, which are threatened because of low usage. The UA will select promising MSc students to do their theses during the project on these topics. Furthermore the UA will lead the development of the agro-biodiversity catalogue that describes Malagasy food plant diversity with support of WorldVeg. The UA contributes also to the inventory of the species and varieties available in the intervention the zones, and to the public awareness for promoting the uses and the consumption of the traditional vegetables.
Have you included a Letter of Support from this organisation?	⊙ Yes

3. Partner Name:	SEMANA
Website address:	*No Response*
Details (including roles and responsibilities and capacity to engage with the project):	SEMANA, a Malagasy seed company, is a strategic project partner. Even though SEMANA will not receive direct funding from this project, the company is committed to collaborate in the training of progressive women farmers in commercial seed production and the development of seed businesses in connection to SEMANA. By establishing this partnership between SEMANA and seed-producing women farmers, the project aims to scale its project results by offering seed of the most promising varieties to improve access to quality seeds for smallholder farmers in whole Madagascar. SEMANA is a partner of French company Technisem, and produces vegetable seeds for local use and export. The Access to Seeds Index identified SEMANA as the principal seed company in Madagascar for vegetables https://www.accesstoseeds.org/app/uploads/2018/03 /Leading-Seed-Companies-in-Eastern-and-Southern-Africa_DEF.pdf
Have you included a Letter of Support from this organisation?	⊙ Yes

4. Partner Name:	*No Response*

Website address:	*No Response*
Details (including roles and responsibilities and capacity to engage with the project):	*No Response*
Have you included a Letter of Support from this organisation?	○ Yes ○ No

5. Partner Name:	*No Response*
Website address:	*No Response*
Details (including roles and responsibilities and capacity to engage with the project):	*No Response*
Have you included a Letter of Support from this organisation?	○ Yes ○ No

6. Partner Name:	*No Response*
Website address:	*No Response*
Details (including roles and responsibilities and capacity to engage with the project):	*No Response*
Have you included a Letter of Support from this organisation?	○ Yes ○ No

If you require more space to enter details regarding Partners involved in the Project, please use the text field below.

No Response

Please provide a cover letter responding to feedback received at Stage 1 if applicable and a combined PDF of all letters of support.

Cover letter WorldVeg 30Nov2018 docx
03/12/2018
06:50:39
pdf 674.96 KB

Letters of support - WorldVeg - compiled
03/12/2018
06:50:18
pdf 1.7 MB

Section 6 - Project Staff

Q10. Key project personnel

Please identify the core staff on this project, their role and what % of their time they will be working on the project.

Please provide 1 page CVs for these staff, or a 1 page job description or Terms of Reference for roles yet to be filled. Please include more rows where necessary. These should match the names and roles in the budget spreadsheet.

Name (First name, Surname)	Role	% time on project	CV attached below?
Fekadu Fufa Dinssa	**Project Leader**	5	Checked
Traditional Vegetable Scientist* (to be recruited in December 2018)	Project Manager	21	Checked
Maarten van Zonneveld	Agro-biodiversity analysis and germplasm collection	5	Checked
Justus Ochieng	Monitoring and evaluation	8	Checked

Do you require more fields?

⊙ Yes

Name (First name, Surname)	Role	% time on project	CV attached below?
Rabary Bodovololona	Responsible for project implementation in Madagascar	40	Checked
Lalaina Ranaivoson	Training and participatory evaluation	25	Checked
Herimihamina Andriamazaoro	Training and participatory evaluation	15	Checked
Denis Randriamampionona	Agro-biodiversity specialist	14	Checked

Please provide 1 page CVs (or job description if yet to be recruited) for the Project staff listed above. Ensure the file is named clearly, consistent with the named individual and role above.

CVs Darwin Initiative Proposal - WorldVeg compiled

03/12/2018

09:02:56

pdf 1020.11 KB

Have you attached all Project staff CVs?

⊙ Yes

Section 7 - Problem Statement & Conventions

Q11. Problem the project is trying to address

Please describe the problem your project is trying to address in terms of biodiversity and its relationship with poverty. For example, what are the drivers of loss of biodiversity that the project will attempt to address? Why are they relevant, for whom? How did you identify these problems?

Madagascar, a historic cross-road of African and Austroasian settlers, is home to many traditional vegetables, such as African eggplant, African nightshade, and Vigna legumes. Traditional vegetables have the potential to diversify Malagasy farming systems and therefore secure benefits of biodiversity for the poor. Traditional vegetables are nutritious, easy to grow, are often hardy, and well adapt to changing climates.

Recognizing this potential, the Darwin Initiative supported the scoping study DARSC182 led by WorldVeg that aimed to understand the diversity of traditional vegetables used by Malagasy farmers; their conservation status and explore opportunities for income and increased consumption.

The scoping study resulted in two major findings:

i) Malagasy farmers still maintain a high diversity of traditional vegetables but production and consumption of these traditional vegetables are low. Low usage makes traditional vegetables vulnerable to local or national extirpation under pressure of land-use change and crop replacement;

ii) A modest investment in seed systems and increased awareness of benefits for nutrition, income, and climate change adaptation would lead to greater utilization of traditional vegetables.

During the scoping study women farmer groups expressed great interest to grow traditional vegetables. This confirms WorldVeg experience in other African countries about the potential of traditional vegetables to empower women in farming businesses.

This project aims to secure benefits of agro-biodiversity for poor farmer households in in two vegetable producing regions: Itasy and Antsirabe. The project will support Malagasy women farmers with practise-oriented research to grow traditional vegetables. This will make farming systems more climate-resilient, secure increased income for women farmers, and improve food and nutrition security of Malagasy households. To sustain current and future use of traditional vegetables, the genetic resources of traditional vegetables will be protected ex-situ and grown in school gardens together with other food plants to raise awareness about Malagasy food plant diversity.

If necessary, please provide supporting documentation e.g. maps, diagrams etc., using the File Upload below:

No Response

Q12. Biodiversity Conventions, Treaties and Agreements

Q12a. Your project must support the objectives of one or more of the agreements listed below. Please indicate which agreement(s) will be supported and describe which objectives your project will address and how. Note: projects supporting more than one will not achieve a higher score.

- ☑ Convention on Biological Diversity (CBD)
- ☑ Nagoya Protocol on Access and Benefit Sharing (ABS)
- ☑ International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

Q12b. Biodiversity Conventions

Please detail how your project will contribute to the objectives of the agreement(s) your project is targeting. You should refer to Articles or Programmes of work here. Note: No additional significance will be ascribed for projects that report contributions to more than one agreement.

The project will evaluate how the ITPGRFA can be applied for Non-annex 1 crops. Although most traditional African vegetables, except Vigna legumes, are not listed on the Annex 1 of the ITPGRFA, the project aims to link directly to the ITPGRFA. This is because the focus of the project is on conservation and use of vegetable genetic resources to diversify farming systems and human diets. In this way, the project will demonstrate the relevance of traditional vegetables and other Non-Annex 1 food plants for the ITPGRFA.
By protecting and promoting vegetable genetic resources, the project contributes to Article 5 of the ITPGRFA about conservation, exploration, collection, characterization, evaluation and documentation of PGRFA; Article 6 about Sustainable Use of PGRFA; and Article 7 about national commitments and international cooperation. The project also contributes to Article 17 of the ITPGRFA about the Global Information System on PGRFA because the passport and characterization data of the collected accessions will be uploaded to Genesys, a global portal to information about plant genetic resources for food and agriculture. Finally, the project will help Madagascar to meet Article 9 about farmer's rights because the project supports farmers in seed saving and project partners will obtain Prior Informed Consent of farmer communities for the collection of germplasm for ex-situ conservation.

Germplasm collection for ex-situ conservation in the Itasy and Antsirabe regions will be done in coordination and with the consent of the involved farmer communities, in addition to the national permits for germplasm collection. These national permits will be requested from the ministry of agriculture in coordination with the national focal point of the ITPGRFA.

For germplasm exchange from Madagascar to the WorldVeg genebank, the Standard Material Transfer Agreement (SMTA) will be proposed in the context of the ITPGRFA. As an exempt, a request will be made to the national authorities to distribute these accessions to small-scale farmers for direct use only, in addition to distribution for breeding, training and research for food and agriculture under the SMTA.

The Nagoya protocol will be applied for the collection of traditional knowledge on the use of agro-biodiversity during the agro-biodiversity four cell assessments. Prior Informed Consent will be obtained from corresponding farmer communities and Mutual Agreed Terms will be negotiated with the corresponding farmer communities in coordination with the national ABS focal point.

WorldVeg breeding lines will be distributed under WorldVeg`s material transfer agreement because this refers to germplasm developed by WorldVeg and is intended for direct use by farmers. Possible commercialization of local varieties by the progressive women farmers and the seed company SEMANA will be done in consultation with the national ITPGRFA and ABS focal points.

The project contributes to CBD Aichi target 13 to ensure that "the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity".

Q12c. Is any liaison proposed with the CBS/ABS/ITPGRFA/CITES/CMS/Ramsar focal point in the host country?

⊙ Yes

Please give details:

Michelle Andriamahazo and Naritiana Ranaivoson, national focal point of the ITPGRFA of the Nagoya

protocol, respectively, support this project. Both participated in Darwin Initiative project, ref 22017 "Mutually supportive implementation of the Nagoya Protocol and Plant Treaty".

Madagascar does not yet treat genetic resources of most vegetables under the ITPGRFA, but Ms Andriamahazo responded positively to be in close contact to ensure that germplasm exchange complies with the context of the ITPGRFA.

Mrs Ranaivoson expressed interest as strategic partner and for further information on the Nagoya protocol application to collect agro-biodiversity traditional knowledge and procedures that complement the ITPGRFA.

Q12d. Global Goals for Sustainable Development (SDGs)

Please detail how your project will contribute to the Global Goals for Sustainable Development (SDGs)

The project will help Madagascar to deliver on the SDGs on "No poverty (1); Zero hunger (2); and Climate action (13).
The project will work with small-scale farmer families in the Itasy and Antsirabe regions to improve the production of traditional vegetables for income generation. Households in these regions are poor; more than 75% live with less than 1.25 USD/day https://harvestchoice.org/data/tpov_pt125. These regions are close to Madagascar's main cities, which provides opportunities to poor farmer families for selling vegetable and developing seed businesses. In this way the project contributes to SDG 1 to eradicate poverty by providing opportunities to increase and stabilize income for women farmers in agricultural activities.
Besides market opportunities, traditional vegetables provide opportunities to diversify diets and reduce hidden hunger by growing vegetables at home or in school gardens for increased vegetable consumption. Capacity development of women farmers in vegetable production, introduction of quality seeds, and strengthening school and home garden will encourage people to grow and eat more vegetables. In this way the project will contribute to SDG 2 on zero hunger.
The introduction of vegetable seed will provide options for farmers to diversify their farming systems. On-farm diversification is a promising adaptation strategy to manage risks under climate change while sustaining income. Traditional vegetables are promising crops for diversification because they have short growing durations (good for quick cash generation and utilizing fallow periods), require little area, and are often hardy crops. The project thus will contribute to SDG 13 on climate action.

Section 8 - Method, Change Expected, Gender & Exit Strategy

Q13. Methodology

Describe the methods and approach you will use to achieve your intended Outcome and Impact. Provide information on how you will undertake the work (materials and methods) and how you will manage the work (roles and responsibilities, project management tools etc.).

This may be a repeat from Stage 1, but you should update or refine as necessary.

Output 1: Good understanding of the status of agro-biodiversity in Malagasy food systems. Geographic patterns of traditional African vegetables diversity are analysed using herbarium records available at the Global Biodiversity Information Facility. Agro-biodiversity four-cell assessments will be carried out in at least six communities encompassing different agroecological zones. Focus-group discussions segregated by gender and age will be organized to understand the current use and conservation status of traditional vegetables and other Malagasy food plants. These actions allow to prioritize food plants that require urgent protection, and to identify popular vegetables that are promising for vegetable production and consumption.
Output 2: Protected and characterized genetic resources of vegetable diversity. Germplasm collection

missions will be organized in collaboration with farmers to rescue landraces of both popular and threatened traditional vegetables, and populations of crop wild relatives focusing on the endemic and endangered wild cowpea Vigna keraudrenii. The accessions will be characterized and seed will be multiplied and made available under conditions as agreed with the Malagasy authorities. These actions will protect Malagasy genetic resources of both popular and threatened vegetables.

Output 3: Malagasy extension workers and women farmers trained on seed saving and production of traditional vegetables. At least 25 Malagasy extension workers will develop capacities in seed saving and vegetable growing in one 3-day course/year. These skilled extension workers will train 200 women farmers during at least five 2-day trainings in seed saving, production, cooking, and selling of traditional vegetables. Existing WorldVeg seed saving and vegetable production videos and leaflets will be translated into Malagasy for dissemination. The women farmers receive seed kits for vegetable production and for their evaluation with seeds from promising WorldVeg and local varieties of traditional vegetables including African eggplant, African nightshade, and vegetable cowpea. Network analyses will be carried out to understand the results of this intervention on seed access and flow from farmer-to-farmer. These actions will enhance and protect vegetable genetic resources through increased utilization.

Output 4: Regional school garden programs strengthened to promote conservation and use of agro-biodiversity. The project strengthens existing school garden initiatives in the regions with training on seed saving and provision of good quality seed of traditional vegetables. A regional conference with multiple stakeholders will be organized on how to incorporate traditional vegetables and threatened food plants in regional school garden programs. In five primary schools, the project pilots the establishment of biodiversity-rich school gardens to raise awareness for local food plants. An agro-biodiversity catalogue will be developed for teachers, school children and the general public to learn about Malagasy food plant diversity.

Output 5: Malagasy women farmers trained on seed production for commercialization. At least ten progressive women farmer leaders develop capacities in one 3-day course/year in seed production, storage, commercialization, and pilot business development of promising varieties of traditional vegetables in collaboration with the seed company SEMANA. The progressive farmers will share their knowledge with other farmers. These actions allow making high quality seed available for a large number of farmers beyond the project intervention sites.

Q14. Change expected

Detail the expected changes this work will deliver. You should identify what will change and who will benefit a) in the short-term (i.e. during the life of the project) and b) in the long-term (after the project has ended).

Please describe the changes for biodiversity and for people in developing countries, and how they are linked. When talking about people, please remember to give details of who will benefit and the number of beneficiaries expected. The number of communities is insufficient detail – number of households should be the largest unit used. If possible, indicate the number of women who will be impacted.

Short-term:

- Twenty-five extension workers (at least 60% women), will develop capacities to train other farmers on seed saving and the production of traditional vegetables. These extension workers can specialize themselves in supporting farmers in vegetable growing.
- Two hundred small-scale women farmers will develop capacity to save seeds and produce traditional vegetables for home consumption and selling. The farmers increase and stabilizes overall income because traditional vegetables protect against shocks and improves their food nutrition security.
- At least 400 accessions of Malagasy landraces of traditional vegetables and populations of their wild relatives are protected through long-term ex-situ conservation at the WorldVeg genebank in Tanzania. These genetic resources will be held in trust and are accessible following agreements with the corresponding Malagasy authorities. Characterization data will be made publicly available in open-access

journals and databases e.g. AVGRIS (seed.worldveg.org) and Genesis (https://www.genesys-pgr.org).
• Current food plant diversity and its use is being documented across different agroecological zones in Madagascar. This provides a basis for conservation actions to protect Malagasy food plant diversity. Local food plant diversity is being exhibited and grown in five school in the Itasy and Antsirabe regions to raise awareness among school children and care takers about Malagasy food plant diversity.
• Eight MSc students from the University of Antananarivo will develop capacities in agro-biodiversity research to academically strengthen this research discipline in Madagascar.
• At least 10 progressive women farmers will increase their overall household income from commercialization of produced seed of traditional vegetables.
• Commercial seed production by progressive women farmers in collaboration with the seed company SEMANA ensures scalability of the project results by offering a large number of farmers access to high quality seed. During the Darwin Initiative scoping study DARSC182, small provisory seed business were observed that sell local seed. This project will improve the quality of the seed sold for better vegetable production in the two targeted regions.
• Five schools in the Itasy and Antsirabe regions will help promoting and protecting local food plant diversity in biodiversity-rich school gardens.
Long term:
• The 200 women skilled farmers continue increasing their vegetable productivity, vegetable production and consumption, and selling beyond the project duration. This will lead to increased vegetable supply in the Itasy and Antsirabe regions, and enhanced protection of traditional vegetables through on-farm conservation. These women farmer leaders inspire other women and men farmers in their farmer associations to grow more traditional vegetables. These women leaders promote gender equality in the expanding business of vegetable growing.
• Primary schools become involved in the protection and promotion of locally threatened food plants after mainstreaming local food plant diversity in regional school garden programs.
• Market demand for traditional vegetables increases after the raising awareness in school garden programs in the Itasy and Antsirabe regions. School children, teachers, and care takers are interested in the nutritional and cultural values of traditional vegetables and other Malagasy food plants. These schools will include traditional vegetables in emerging school-feeding programs.

Q15. Gender

All applicants must consider whether and how their project will contribute to reducing inequality between persons of different gender. Explain how your project will collect gender disaggregated data and what impact your project will have in promoting gender equality.

As in many other countries, women lack access to agricultural input, information and technology; and earn significantly lower wages and business profits than men in Madagascar. As a result, women are more vulnerable and have less development opportunities - http://hdl.handle.net/10986/26303. In addition, women farmers grow traditional vegetables rather than men farmers. This project therefore supports women farmers in growing traditional vegetables and producing seeds as business opportunities and new options for livelihood diversification.
Household surveys with women farmers will be held at the project start and end. To document agro-biodiversity use, women and men focus-group discussions will be organized in at least six communities. These allow to analyse the context in which women and men use agro-biodiversity focusing on traditional vegetables in diets, income generation, and farm diversification. This will help to understand and examine gender dimensions of the project. In a similar way, these focus-group discussions will be organized for young adults and elder people to understand differences between generations.
The project will develop the capacity of 200 women farmers in vegetable production to encourage gender equality in vegetable production and seed production of promising vegetables for commercialization. At least 60% of the 25 extension workers who train these women farmers will be women to enhance gender

diversity and women perspectives in farmer support. At least 10 progressive women farmer leaders are trained in seed production for commercialization, to enhance and integrate women's role in seed system development of vegetable crops in Madagascar.
Network analyses will help to understand how knowledge and seed are being shared from farmer-to-farmer, and how this affect women's and men's access to seed and knowledge. These analyses provide insights into how the project interventions enhance the involvement of women farmers in farming and income generation.

Q16. Exit Strategy

State whether or not the project will reach a stable and sustainable end point. If the project is not discrete, but is part of a progressive approach, give details of the exit strategy and show how relevant activities will be continued to secure the benefits from the project. Where individuals receive advanced training, for example, what will happen should that individual leave?

Intensive capacity development activities ensure the sustainability of the project results. Twenty-five local extension workers and 200 women farmer leaders are intensively trained with one or more trainings per year to become leaders in sustainable vegetable growing. The extension workers can use their acquired skills for vegetable growing and seed saving in other activities beyond the project. The women farmer leaders are able to continue growing vegetables successfully after the project and can teach other women of local farmer associations in vegetable production.
For scaling, the project has a two-fold strategy. First, the project will collaborate with the seed company SEMANA to train at least ten progressive women farmers in seed production to establish seed businesses to provide seeds of the most popular varieties to thousands of farmers. Second, the project will develop capacities in NGOs and government institutions in the Itasy and Antsirabe that promote production and consumption of traditional vegetables.
Genetic resources of traditional vegetables and their wild relatives will be maintained ex-situ in the WorldVeg genebank in Tanzania for long-term conservation and further research. A regional conference will be organized on how to incorporate traditional vegetables and threatened food plants in existing regional school garden programs.

Please provide supporting documentation e.g. maps, diagrams etc., using the File Upload below:

No Response

Section 9 - Existing works, Ethics & Safeguarding

Q17a. Harmonisation

Is this a new initiative or a development of existing work (funded through any source)?

⊙ New Initiative

Q17b. Are you aware of any other individuals/organisations/projects carrying out or applying for funding for similar work?

⊙ No

Q18. Ethics

Outline your approach to meeting the Darwin Initiative's key principles for research ethics as outlined in the Guidance.

The project will be in permanent communication with the national focal point of the ITPGFRA and WorldVeg policy counsellor to ensure compliance with all relevant access and benefit sharing legislation pertaining to germplasm collection and the utilization of genetic resources and associated traditional knowledge.
Following the recommendations of Ms Michelle Andriamahazo, the national focal point of the ITPGRFA, FOFIFA will have a leading role in the project to ensure that national perspectives, interests and wellbeing of local communities are properly addressed.
By carrying out focus-group discussions on the use of agro-biodiversity and carrying out on-farm evaluation with farmers, the project recognises the value and relevance of traditional knowledge. For the focus-group discussions, on-farm evaluation, school activities, and other participatory research activities with humans, the project will follow WorldVeg`s guidelines on ethical considerations in human-subject research. In that way, the project will respect the rights, privacy, and safety of the people involved, especially of potentially vulnerable groups such as the women farmers and school children.
As part of the project`s ethical guidelines, country approval and Prior Informed Consent will be obtained from farmer groups, care takers of school children, and teachers for the following activities: interviews, focus-group discussions, school activities, on-farm evaluation, and germplasm collection.
The project is committed to protect the health and safety of all staff working full and part time on their project, and will provide guidelines in terms of traveling and field visits.
The project team will conduct solid research that will be subjected to peer-review for publication. Data will be made openly available after publication through WorldVeg`s HARVEST repository system for verification and further use of the data by other researchers and practitioners.

Q19. Safeguarding

(see Guidance Note 3.8)

Projects funded through the Darwin Initiative must fully protect vulnerable people all of the time, wherever they work. In order to provide assurance of this, we would like projects to ensure they have the appropriate safeguarding policies in place. Please tick the box to confirm you have relevant policies in place and that these can be available on request.

Checked

Section 10 - Biodiversity & Project Information

Q20. Raising awareness of the potential worth of biodiversity

If your project contains an element of communications, knowledge sharing and/or dissemination please provide a description of your intended audience, how you intend to engage them, what the expected products/materials will be and what you expect to achieve as a result. For example, are you expecting to directly influence policy in your host country or is your project a community advocacy project to support better management of biodiversity?

The project advocates for better conservation and use of traditional vegetables in Madagascar to enhance nutrition and income options for farmer families, especially women, and to safeguard agro-biodiversity. M&E household surveys will provide data on the economic, agro-ecological, and nutritional benefits of growing traditional vegetables. Different channels will be used to raise awareness about the benefits of traditional vegetables for nutrition, culture, diversification of farming systems, protection against climate shocks, and income generation.
The project will inform Malagasy people through articles in national newspapers about the importance of traditional vegetables for nutrition, culture, farming systems, and income generation. With the development of an agro-biodiversity catalogue and biodiversity-rich school gardens, the project aims to raise awareness among school children and care takers about the values of vegetable farming and Malagasy food plant

diversity.
The 200 skilled women farmers and the 25 extension workers will share knowledge with other farmers and provide an example on how to grow and commercialize traditional vegetables. They act as ambassadors of growing and safeguarding traditional vegetables.
A regional conference will be organized in year 3 to discuss among researchers, practitioners, policy makers, and donors on how to incorporate local food plant diversity in regional school garden programs. Such activities would and promote the use of these local food plants and improve their conservation status. Media will be invited to send a message to the general public about the benefits of traditional vegetables for healthier diets and climate-resilient farming systems.
During the Annual Genebank Meeting organized by the Crop Trust and other international venues, WorldVeg will raise awareness about the importance of including vegetable genetic resources in the MultiLateral System of the ITPGRFA.
The project will publish in WorldVeg Newsletter 'Fresh' to communicate about the advances of the project to a wide audience of practitioners.

Q21. Capacity building

If your project will support capacity building at institutional or individual levels, please provide details of what form this will take and how this capacity will be secured for the future.

The project allocates more than 15% budget to capacity building to sustain and scale the project results. An intensive program of capacity development of 25 extension workers and 200 women farmers will ensure the sustainability of the project results.
Twenty-five extension workers, of which at least 60% are women, will be intensively trained in yearly short courses in vegetable growing and seed saving to provide training to men and women farmers during the project. At the end of the project, these persons have been skilled to continue giving training in vegetable cultivation.
The project focuses on intensive training of 200 women farmers in a series of five short courses during the project duration. By providing this series of short courses, the involved women farmers will deepen their understanding in vegetable production and can become community leaders in vegetable growing. By the end of the project, the 200 women farmers are fully prepared to produce vegetables without further support by the project. The training of 200 farmers will have a multiplier effect because these farmers will inspire other women and men farmers who want to start vegetable production and commercialization.
The project will develop capacities of personnel of NGOs such as GSDM and AGRISUD, staff from local government organizations that work already in existing school garden programs, and teachers from primary schools in growing traditional vegetables, seed saving, and good practices in vegetable production. The agro-biodiversity catalogue and biodiversity-rich school gardens will help primary school teachers to explain and discuss with their students and their care takers the relevance of agro-biodiversity as a biocultural heritage, a source for human diets, and the importance of this diversity for nutrition.

Q22. Access to project information

Please describe the project's open access plan and detail any specific funds you are seeking from the Darwin to fund this.

All scientific papers will be published with open-access in ISI-indexed journals. Budget is being requested in this Darwin Initiative proposal to cover the costs of one open-access publication during the project duration. More scientific papers may be published after the project ends. All papers will have an explicit reference to the support of the UK Darwin Initiative in their acknowledgements.
Datasets will be made available following institutional guidelines on the WorldVeg' HARVEST portal https://worldveg.tind.io/ after publication of the scientific publications. Each dataset will contain metadata

to explain the dataset and a DOI for reference.
Seed saving videos will be uploaded to Youtube for free access to everyone with access to Internet in Madagascar, which is currently about 5% of the population, and which is expected to increase in the coming years.
The 200 women farmers play an important role in exchanging knowledge and seeds to other farmers. The network analyses will provide insights how this information is being spread across farmers.
The conference on how to incorporate local food plant diversity in regional school garden programs, will allow to connect the project results to NGOs and government organizations that coordinate existing school garden programs in the regions. Passport data of at least 400 accessions collected in Madagascar will be uploaded to the Webpage of the Genesys, the global portal to genetic resources https://www.genesys-pgr.org/ and WorldVeg database AVGRIS http://seed.worldveg.org/ so that people can access the information and contact details to request and access germplasm.

Section 11 - Logical Framework

Q23. Logical Framework

Darwin projects will be required to report against their progress towards their expected Outputs and Outcome if funded. This section sets out the expected Outputs and Outcome of your project, how you expect to measure progress against these and how we can verify this.

Impact:

Traditional vegetable production is culturally and commercially attractive for small-scale vegetable growers in Madagascar, offering a wide range of vegetables to improve food and nutrition security of Malagasy households.

Project summary	Measurable Indicators	Means of verification	Important Assumptions

Outcome: Protection and enhancement of genetic resources of traditional vegetables in Madagascar resulting in increased access to vegetables for 15,000 Malagasy people, climate-resilient farming systems, and improved protection of vegetable biodiversity.	0.1. At least 1,000 farmer households in the Itasy and Antsirabe regions report a 25% increase of their overall income and an 25% more stable income by growing traditional vegetables (survey sample = 200 farmers participating directly in the project and 200 randomly selected farmers not participating directly) 0.2. Farmer families that grow traditional vegetables are food and nutrition secure through the whole year. 0.3. At least 400 accessions of vegetable landraces from Madagascar are protected ex-situ. 0.4. School children in the participating primary schools increased their knowledge and improved their attitude regarding consumption, nutrition, and taste of traditional vegetables 0.5. 100% increase in sales of traditional vegetable seeds.	0.1. Development outcome household survey developed by WorldVeg socio-economist is used as baseline and monitoring at the beginning and end of the project. These assessments allow to measure improvements in livelihoods of women farmers and their households in the project intervention sites during and after project. 0.2. A survey report about growing, consumption, and selling of traditional vegetable crops at the beginning and end of the project allows measuring the increase in utilization of traditional vegetables by farmers in the Itasy and Antsirabe regions. 0.3. Passport data of at least 400 accessions are uploaded to the Genesys Webpage, the global portal to genetic resources https://www.genesys-pgr.org/ so that people can access the information and contact details to access germplasm. 0.4. Focus-group discussions with school children and their care takers in year 2 and 3 of the project allows to understand increase in knowledge and	The project estimates to indirectly impact 15,000 Malagasy people on the basis of the following assumptions: For each of 1,000 farmers growing traditional vegetables in the Itasy region, at least 3 households with on average 5 household members will increase their consumption of traditional vegetables because of improved access to the vegetables. 3 households x 5 members x 1,000 farmers = 15,000 Malagasy people

		appreciation of traditional vegetables by school children and their care takers. 0.5. Statistics on the seed sales of traditional vegetables by progressive women farmers and the seed company SEMANA at the beginning and end of project allow measuring the increase in seed commercialization.	
Output 1: Good understanding of the status of agro-biodiversity in Malagasy food systems	1.1. Hotspots of Malagasy crop diversity in year 1 determined on the basis of GIS analysis and GBIF herbarium records of food plants listed to grow in Madagascar. 1.2. Agro-biodiversity four-cell assessments in at least six communities in different agroecological zones to understand the use and consumption of vegetables and other cultivated and wild food plants in Madagascar in year 1 and 2.	1.1. Species diversity maps developed to identify geographic patterns of the diversity of traditional vegetable crops. 1.2. Report made available about the agro-biodiversity four-cell assessments.	Communities can be accessed for, and are willing to participate in the agro-biodiversity four-cell assessments.

Output 2: Protected and characterized genetic resources of vegetable diversity	2.1. Germplasm collection of traditional vegetables and their wild relatives in different agroecological zones in collaboration with farmer groups in year 2. 2.2. Seed multiplication and characterization of collected vegetable landraces in Madagascar and Arusha in year 1, 2 and 3. 2.3. At least 1 publication submitted on morphological characterization of landraces of traditional vegetables in year 3.	2.1. Passport data of at least 400 collected vegetable landraces is being uploaded to the Webpage of the Genesys, the global gateway to plant genetic resources https://www.genesys-pgr.org/. 2.2a. Report with characterization data of the collected vegetable landraces is made available. 2.2b. External review of seed multiplication and conservation done by the Crop Trust. 2.3. Confirmation of journal of receipt of manuscript.	FOFIFA will obtain permits with the corresponding national authorities in consultation with the ITPGRFA focal point to collect and ship seeds to the WorldVeg genebank of traditional African vegetables in Arusha, Tanzania.

Output 3: Malagasy extension workers, trained on seed saving and production of traditional vegetables	3.1. 25 extension workers, of which at least 60% women, attend a 3-day training-of-trainers course on seed saving of traditional vegetables and vegetable growing in year 1, 2, and 3. 3.2. Seed saving videos translated into Malagasy in year 1. 3.3. 1 seed saving leaflet in Malagasy developed in year 1. 3.4. 1 home garden guide in Malagasy developed in year 1. 3.5. 200 small-scale women farmers receive five 2-day trainings during the project duration by extension workers on seed saving of traditional vegetables and vegetable growing. 3.6. 250 seed kits developed per year of promising varieties of African nightshade, African eggplant, amaranth, Ethiopian mustard among other crops to provide seeds to the 200 women farmers for varietal evaluation and NGOs that participate in regional school and home garden programs in year 1 and 2. 3.7. Participatory evaluation by 200 women farmers of promising introduced	3.1. Minutes and five photos per training course. 3.2. YouTube link to seed saving video. 3.3. Signed receipt by women farmers of seed saving leaflets. 3.4. Signed receipt by women farmers of home garden leaflets. 3.5. Minutes and five photos per capacity development event. 3.6. Signed receipt by farmers of received seed kits. 3.7. Data deposited on WorldVeg repository. 3.8. Report on network analyses made available. 3.9. Household survey data deposited on WorldVeg repository	Communities can be accessed by extension workers and MSc students to support capacity development of women farmers and to support school gardens and other agro-biodiversity activities in primary schools.

	and local varieties of traditional vegetables in year 2 and 3. 3.8. Two network analyses in respectively the Itasy and Antsirabe regions to understand flow of seeds supplied to women farmers within communities in year 3. 3.9. Household surveys for monitoring and evaluation with 200 women farmers involved in the project and 200 who are not involved.		
Output 4: School garden programs strengthened to promote conservation and use of agro-biodiversity	4.1. Biodiversity-rich school gardens established in five primary schools in year 2 and 3. 4.2. Focus-group discussions with school children and care takers to understand their awareness, knowledge, perceptions about traditional vegetables in year 2 and year 3. 4.3. Agro-biodiversity catalogue of Malagasy vegetables year 2. 4.4. Conference organized with NGOs, regional authorities, and school directors organized on how to incorporate local food plant diversity in regional school garden programs in year 3.	4.1. Reports available on the school garden establishment. 4.2. Report available on the focus-group discussions. 4.3. Agro-biodiversity catalogue in Malagasy and English 4.4. Workshop proceedings.	School directors give permission to establish school gardens. School directors and care takers give permission to interview school children. Students and teachers maintain school gardens.

Output 5: Malagasy women farmers trained on seed production for commercialization.	5.1. At least 10 progressive women farmers attend a 3-day training course on seed production, storage, and commercialization of promising varieties of traditional vegetables in year 1, 2, and 3. 5.2: At least 10 progressive farmers will develop seed business to sell seeds of traditional vegetables in local markets or as part of collaboration with the seed company SEMANA in year 2 and 3.	5.1. Minutes of and five photos of capacity development events. 5.2. Amount of seed sold by women seed producers in collaboration with the seed company SEMANA.	Progressive women farmers are interested to develop seed businesses

Do you require more Output fields?

It is advised to have less than 6 Outputs since this level of detail can be provided at the Activity level.

⊙ No

Activities (each Activity is numbered according to the Output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

The word count for each individual activity should be no more than 25 words.

Activity details

Activity Number

1.1. Determination of hotspots of traditional vegetable diversity with GIS in year 1

Activity Details

Geographic patterns of traditional African vegetables diversity will be analysed using herbarium records available at the Global Biodiversity Information Facility. WorldVeg has developed a list of 534 traditional vegetables from Asia and Africa on the basis of the Plant Resources of Tropical Africa and other key resources. This list will be enriched with a selection of endemic food plants from Madagascar according to Plant Resources of Tropical Africa and other key resources. R software will be used to identify geographic areas with high observed richness of traditional vegetables following existing methods developed by WorldVeg and partners https://doi.org/10.1111/ddi.12724. Resampling without replacement will be carried out to reduce sampling bias in the herbarium records. The extent of occurrence and area of occupancy in combination with information on local use of these food plants will allow to assess the conservation status of these food plants. This analysis will provide a scientific basis to understand the geography and conservation status of food plant diversity in Madagascar and will contribute to target geographic areas for germplasm collection in activity 2.1 and provide key information for the agro-biodiversity catalogue that will be developed for school children and the general public in activity 4.3.

Activity details

Activity Number

1.2. Agro-biodiversity four-cell assessments in at least six communities in year 1 and 2.

Activity Details

Focus-group discussions segregated by gender and age will be organized to understand the current use and conservation status of traditional vegetables and other Malagasy food plants. These actions allow to prioritize food plants that require urgent protection because of their low usage, and to identify popular vegetables that are promising for vegetable production and consumption. The assessments will be done in different agroecological zones in Madagascar including the Itasy and Antsibare regions.

In each community, a women and men focus-group discussion will be organized. These segregated assessments allow to analyse the context in which women and men use agro-biodiversity focusing on traditional vegetables in diets, income generation, and on-farm diversification. This will help to understand and examine gender dimensions of the project. In a similar way, these focus-group discussions will be organized for young adults and elder people to understand differences between generations. Each focus-group discussion will take about 5 hours. The information collected provide key information to prioritize traditional vegetables for promotion and conservation, and secondly to target food plants that are threatened because of low usage for ex-situ protection and incorporation in biodiversity-rich school gardens.

MSc students from the University of Antananarivo will be trained to carry out these assessments. After data collection, they will taxonomically identify all food plants that were documented under supervision of the participating researcher from the University of Antananarivo who is a specialist in Malagasy plant diversity.

Activity details

Activity Number

2.1. Germplasm collection in year 2

Activity Details

Two germplasm collection will be carried out. One germplasm collection focuses on popular and threatened traditional vegetables in the communities that were visited during the four cell assessments. The other collection mission focuses on the endemic and endangered wild cowpea, Vigna keraudrenii.

The targeted communities will be in Itasy and Antsirabe regions. If other regions maintain high diversity of traditional vegetables, they will also be visited. Germplasm collection will be done in coordination and with the consent of the involved farmer communities, in addition to the national permits for germplasm collection. These national permits will be requested from the ministry of agriculture in coordination with the national focal point of the ITPGRFA.

On the basis of the information from the four-cell assessments, vegetable crops are prioritized because of their potential for consumption and production, their threat status, or both. With the information of the four-cell assessment, seed harvesting periods are determined to coordinate with the communities the best month to visit their areas for germplasm collection.

For Vigna keraudrenii, a collection sheet will be developed with images, observed and modelled distribution maps, and known information about the time period of flowering and seed production. Exploratory visits will be made to the 12 known locations where herbarium collections were observed according to the Global Biodiversity Information Facility to

identify populations for germplasm collections. If these populations are gone because of land use change, a species distribution model using ensemble modelling of the BiodiversityR package will be developed. This model will be used to identify potential areas of occurrence in nearby areas with natural vegetation and similar climate and soil conditions as found in the original collection sites. These areas will then be visited to find still-existing populations of Vigna keraudrenii.

Seed of the collected germplasm will be shared between WorldVeg and the national partners.

Activity details

Activity Number

2.2. Seed multiplication and characterization in year 1, 2 and 3.

Activity Details

WorldVeg has ample experience in seed multiplication of breeding lines and accessions. For seed kits distribution and on-farm evaluation, the seed of promising accessions and breeding lines will be multiplied initially in Arusha, Tanzania. Staff of FOFIFA will be trained in the seed production to carry out seed multiplication in Madagascar of WorldVeg lines. FOFIFA will also multiply seed of locally promising varieties after approval by local farmer communities and in consultation with the national focal points of ITPGRFA and the Nagoya protocol. For the collected germplasm, accessions will be regenerated in Tanzania following WorldVeg's protocols to maintain genetic integrity to avoid cross-pollination, which includes seed production in net cages. Morphological characterization will be carried out in two environments, in Tanzania and in the FOFIFA experimental station in the Antsirabe region

Activity details

Activity Number

2.3. Development of publication on morphological characterization of landraces of traditional vegetables in year 3

Activity Details

On the basis of results from the four-cell assessments, germplasm collection and morphological characterization a paper will be developed with the project partners for an ISI-indexed journal.

Activity details

Activity Number

3.1. Training of trainers for 25 extension workers in year 1, 2, and 3.

Activity Details

At least 25 Malagasy extension workers will develop capacities in seed saving, vegetable growing, and participatory evaluation in one 3-day course/year. They will be trained by WorldVeg and FOFIFA staff. At least 60% of the 25 extension workers will be women to enhance gender diversity and women perspectives in farmer support.

Activity details

Activity Number

3.2. Translation of seed saving videos into Malagasy in year 1

Activity Details

Existing WorldVeg Youtube seed saving videos on African nightshade, eggplant, amaranth, pumpkin and tomato will be adjusted, translated into Malagasy by FOFIFA https://avrdc.org/saving-seed/. The translated seed saving videos will be uploaded to Youtube for free access to everyone with access to Internet in Madagascar, which is currently about 5% of the population, and which is expected to increase in the coming years

Activity details

Activity Number

3.3. Development of 1 seed saving guide in Malagasy in year 1

Activity Details

An existing farmer guide for seed saving will be adjusted and translated into Malagasy by FOFIFA http://203.64.245.61/web_docs/manuals/save-your-own-veg-seed.pdf for dissemination to women farmer groups in the Itasy and Antsibare regions.

Activity details

Activity Number

3.4. Development of 1 home garden leaflet in Malagasy in year 1

Activity Details

These home garden leaflets accompany the vegetable seed kits that will be distributed. They provide basic agronomic information on how to grow and manage vegetables and provide basic nutritional values of the traditional vegetables that can be grown with the seed kits.

Activity details

Activity Number

3.5. Training of 200 small-scale women farmers in year 1, 2, and 3

Activity Details

The skilled 25 extension workers previously trained by the project will train 200 women farmers from different women farmer groups in the Itasy and Antsirabe region during at least five 2-day training in seed saving, production, cooking, and selling of traditional vegetables. These courses will be carried out in the local communities where the women farmers live. Each extension worker will train eight women farmers. Because of this intensive and individualized training program, it can be anticipated that the 200 women farmer become leaders who are able to continue growing vegetables successfully after the project and can teach and inspire other women of local farmer associations in vegetable production.

Activity details

Activity Number

3.6. Development of 250 seed kits per year of promising varieties in year 1, 2, and 3

Activity Details

WorldVeg has an ample experience in the development of vegetable seed kits. For this project, each seed kit will contain six seed samples of three prioritized traditional vegetables and three varieties consisting of selections and breeding lines from the WorldVeg genebank and local promising selections from Madagascar. These seed kits will be distributed to the 200 women farmers to grow vegetables and evaluate different crops and varieties. Seed kits will be developed with different crop and variety compositions to enable on-farm evaluation for a wide range of crops. Women farmers will thus receive different sets of crops and varieties that they will evaluate in their own farm.
In addition, 50 seed kits will be made available for NGOs in the region that have home and school garden projects.
By introducing new varieties in combination with safeguarding threatened landraces and food plants ex-situ, the project will strengthen Malagasy seed systems of traditional vegetables and finds a balance between the promotion and rescue of the diversity of traditional vegetables and other food plants.

Activity details

Activity Number

3.7. Participatory evaluation by 200 women farmers in year 2 and 3

Activity Details

The 200 women farmers will receive seed kits with three crops with three varieties each to test how they perform on their farms. The project will apply new participatory approaches such as Tricot that combine straightforward ranking with innovative statistical software
https://doi.org/10.1017/S0014479716000739. These novel ranking statistical methods allow to evaluate a large number

of varieties and crops combining data from on-farm evaluations of different crop and variety combinations. In other words, the 200 women farmers will evaluate different crops and varieties. Their ranking data can be merged into a single ranking analysis for a large number of crops and a list of varieties. On the basis of two years of evaluating different crops and different varieties, a single ranking analysis will be constructed to select the most promising crop and varieties per region and per agroecological zone. These crops and varieties will be recommended to women farmers in each of the two regions for commercial vegetable production. These most promising varieties and crops will also be targeted for commercial seed production by the women farmers.
The women farmers will give an overall rank for the crops and varieties that they evaluate. They also will make more specific rankings on the basis of climate resilience, pest and disease tolerance, taste, commercial potential, among others. The on-farm evaluation of these crops and varieties can be done in a small space of their home garden, at a farm edge or other small piece of terrain. This will minimize risks and opportunity costs for the participating women farmers in case of damage or loss of the lines that they evaluate.
The crops and varieties for evaluation will be selected during the inception meeting and in consultation with the women farmer groups to which the 200 women farmers pertain. Four popular vegetables have high chances to be included: African eggplant (Solanum aethiopicum), African nightshade (Solanum spp.), vegetable cowpea (Vigna unguiculata), and mungbean (V. radiata). African eggplant and nightshade were identified as popular vegetables during the scoping study DARSC182 on Utilizing biodiversity of traditional African vegetable species. Vegetable cowpea and mungbean are important legume food crops in Madagascar that were introduced by African and Austroasian settlers http://www.pnas.org/content/113/24/6635.

Activity details

Activity Number

3.8. Seed network analyses in the Itasy and Antsirabe regions in year 3

Activity Details

Two MSc students will carry out social farmer seed network analyses to understand how seed and knowledge passes from farmer-to-farmer, and how this affect women's and men's access to seed and knowledge. They will do their study in one or more communities in the Itasy and Antsirabe regions. Their study will consist of focus-group discussions and individual interviews with women and men farmers to map the social seed networks. For the focus-group discussion and each interview they will request prior informed consent and explain to the participants how their data will be used. Tracings seeds and mapping seed networks provide insights into how the project interventions enhance the involvement of women farmers in farming and income generation. It will further provide a better understanding of the effectiveness of seed kit distribution in seed system development of vegetables. The multiplier effect of seed exchange between recipients of seed kits and non-recipients can substantially contribute to the diversification of seed supply over a large territory https://doi.org/10.1016/j.foodpol.2015.07.008. All data will be anonymized in data publication.

Activity details

Activity Number

3.9. Household surveys with 200 women farmers involved in the project and 200 not involved

Activity Details

Household surveys for monitoring and evaluation will be carried out at the beginning and end of the project with 200

women farmers in the Itasy and Antsirabe regions who are involved in the project and 200 randomly selected women farmers in the study areas who are not directly involved. These assessments allow to measure improvements in income, income stability, gender equality and food and nutrition security of farmer households in the project intervention sites. They are a baseline for monitoring the improvement in livelihoods during and after the project. The development outcomes of receiving training and growing traditional vegetables can be measured by comparing progress between women farmers who participated in the project and those who did not. In addition, it will be of special interest to see whether the women farmers who are not directly involved have started to grow more traditional vegetables after farmer-to-farmer exchange of knowledge and seed during the project. WorldVeg Enabling Impact team has an ample experience in developing household surveys to measure development outcomes of growing traditional vegetables. They will develop these household surveys accordingly. Extension workers of FOFIFA will interview the women farmers. They will request prior informed consent and explain to the respondents how the information provided will be used. All data will be anonymized for data publication.

Activity details

Activity Number

4.1. Establishment of biodiversity-rich school gardens in five primary schools in year 2 and 3

Activity Details

In five primary schools across the Itasy and Antsirabe regions, the project pilots the establishment of biodiversity-rich school gardens to maintain and raise awareness for local food plant diversity. These schools will be invited to participate on the basis of their interest to grow local food plant diversity including popular traditional vegetables and threatened food plants. The project includes budget to establish these school gardens and to train teachers and school staff how to continue maintaining the school gardens after the project ending. The teachers will further develop capacities on how to grow traditional vegetables and other local food plants. The schools will receive seed of local popular traditional vegetables as well as threatened food plants that are used by only a few people. These schools will be examples for existing school garden programs in the region and other parts of Madagascar on how to incorporate local food plant diversity in school gardens.

Activity details

Activity Number

4.2. Focus-group discussions with school children and care takers in year 2 and year 3.

Activity Details

Focus-group discussions with school children and care takers in the five schools will be carried out in year 2 and 3 of the project to understand attitudes and perceptions towards traditional vegetables and how school activities such as the establishment of biodiversity-rich school gardens can help to promote the use of traditional vegetables and to raise awareness to maintain local food plant diversity

Activity details

Activity Number

4.3. Development of agro-biodiversity catalogue in year 2.

Activity Details

An agro-biodiversity catalogue will be developed for teachers, school children and the general public to learn about Malagasy food plant diversity. This catalogue will present the different food plants that were documented during the four-cell assessments. Each species will be presented with its local name, images, uses, distribution and conservation status on the basis of their distribution range and current usage. The catalogue will be translated into English and Malagasy for both local users including teachers and school children as well as a general public in Madagascar and outside. With the development of an agro-biodiversity catalogue and biodiversity-rich school gardens, the project aims to raise awareness among school children, teachers, care takers, and the general public about the values of vegetable farming and Malagasy food plant diversity.

Activity details

Activity Number

4.4. Organization of a conference on how to incorporate local food plant diversity in Malagasy school garden programs in year 3

Activity Details

A conference will be organized in which the biodiversity-rich school gardens and the agro-biodiversity catalogue will be presented to policy makers, practitioners, and donors. Governmental organizations, regional authorities, school directors and NGOs that coordinate school gardens in different parts of Madagascar will be invited to present their experiences. A discussion session will be organized to develop an action plan how school garden programs in Madagascar can incorporate activities to promote and maintain local food plant diversity.

Activity details

Activity Number

5.1. Yearly training courses on seed production and commercialization for at least 10 progressive women farmers in year 1, 2, and 3.

Activity Details

The progressive women farmers will be trained to increase seed quality and health of varieties of traditional vegetables that are being evaluated on-farm. This will be done in a yearly course of three days. The feasibility and suitability of a range of seed storage options will be reviewed with the women farmers and the seed company SEMANA to save seeds for commercialization.

Activity details

Activity Number

5.2. Development of seed businesses by at least 10 progressive women farmers in year 1, 2, and 3

Activity Details

Training on seed production and commercialization will be combined with the development of action plan to establish seed businesses by year 3. This action plan will be developed in year 1 by the women farmers in collaboration with the seed company SEMANA and in consultation with the national focal points of the ITPGRFA and Nagoya protocol. The action plan will include targets for year 1, 2, and 3. These targets will be determined be the same participants and can include year-round planning scheme established in year 1; local seed storage for healthy seed assured in year 2, and seed selling or seed-producing contracts established in year 3. During the establishment of the action plan, the women farmers and SEMANA will look at the feasibility of different business models and identify the most promising one to pursue. The different business models include the development of local seed businesses of own-produced seeds; or contract seed-production of traditional vegetables for SEMANA and retail seed business of traditional vegetable seed packs of SEMANA. By developing these seed businesses thousands of farmers can be reached with clean and healthy seeds of improved varieties. This will increase the supply of traditional vegetables contributing to income opportunities in the Itasy and Antsirabe regions as well as food sovereignty, and improved nutrition in Madagascar.

Section 12 - Implementation Timetable

Q24. Provide a project implementation timetable that shows the key milestones in project activities

Please complete the Excel spreadsheet linked below to describe the intended workplan for your project.

Implementation Timetable Template

Please add columns to reflect the length of your project.

For each activity (add/remove rows as appropriate) indicate the number of months it will last, and fill/shade only the quarters in which an activity will be carried out. The workplan can span multiple pages if necessary.

Time table of implementation - WorldVeg final
03/12/2018
15:00:07
xlsx 12.52 KB

Section 13 - Monitoring and Evaluation

Q25. Monitoring and evaluation (M&E) plan

Describe, referring to the Indicators above, how the progress of the project will be monitored and evaluated, making reference to who is responsible for the project's M&E.

Darwin Initiative projects are expected to be adaptive and you should detail how the monitoring and evaluation will feed into the delivery of the project including its management. M&E is expected to be built into the project and not an 'add' on. It is as important to measure for negative impacts as it is for positive impact. Additionally, please indicate an approximate budget and level of effort (person days) to be spent on M&E (see "Finance for Darwin and IWT Guidance").

Researchers from WorldVeg Enabling Impact team are responsible for M&E. In collaboration with the national partners and MSc students the project will collect and analyse M&E data to develop a baseline for future impact studies and to measure the advances in better nutrition and progress out of poverty during this project.

M&E activities are built into of the project:
Agro-biodiversity four-cell assessments will be organized at the beginning of the project in at least six communities to understand the role of women and men, young and elder in the use of agro-biodiversity in farming, diets, sales, and purchases. These studies will be used as baseline to monitor the use and conservation status of food plants by communities over time and to follow the trends in on-farm conservation of crop diversity. Six MSc students will carry out the data collection and analysis. Estimated number of days of data collection: 132 days. Estimated number of days of analysis and reporting: 528 days.
The Crop Trust will carry out an external review of the germplasm conservation, characterization, and seed multiplication at the WorldVeg genebank in Tanzania. This will ensure the quality of the whole genebank collection, including the accessions collected in Madagascar. Estimated number of days of data collection: 10 days. Estimated number of days of analysis and reporting: 10 days.
Focus-group discussions with school children and care takers will be carried out in year 2 and 3 of the project to understand attitudes and perceptions towards eating vegetables. These discussions are being held after receiving Prior Informed Consent of care takers and school directors. Estimated number of days of data collection: 30 days. Estimated number of days of analysis and reporting: 30 days.
M&E household surveys will be carried out at the beginning and end of the project with 200 women farmers who are involved in the project and 200 randomly selected women farmers who are not directly involved. These surveys can be used as baseline for monitoring the improvement in livelihoods during and after the project.
These assessments allow to measure improvements in income, income stability, gender equality and food and nutrition security of farmer households in the project intervention sites. Estimated number of days of data collection: 267 days. Estimated number of days of analysis and reporting: 40 days.
Network analyses will be carried out by two MSc students in the project sites to understand how seeds are being distributed by women and men farmers in local seed systems, how this affects to quality in access to new crop diversity. These network analyse will help to understand the multiplier effect of the trained women farmers in disseminating knowledge and seed to other farmers and their role in strengthening local seed systems. Estimated number of days of data collection: 88 days. Estimated number of days of analysis and reporting: 132 days.

Total project budget for M&E (this may include Travel and Subsistence Costs)	**Staff and**
Number of days planned for M&E	1,267

Percentage of total project budget set aside for M&E	10

Section 14 - Funding and Budget

Q26. Budget

Please complete the Excel spreadsheet linked below, which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet.

Darwin and IWT Budget Template

Please refer to the Finance for Darwin/IWT Guidance for more information.

NB: Please state all costs by financial year (1 April to 31 March) and in GBP. The Darwin Initiative cannot agree any increase in grants once awarded.

Please upload your completed Darwin Budget Form Excel spreadsheet using the field below.

- **Budget_Darwin_-_WorldVeg final**
- 03/12/2018
- 08:40:37
- xlsx 42.73 KB

Q27. Value for Money

Please explain how you worked out your budget and how you will provide value for money through managing a cost effective and efficient project. You should also discuss any significant assumptions you have made when working out your budget.

For effective project implementation, the project builds on WorldVeg' s experiences in East Africa on breeding and distribution of traditional vegetable breeding lines, and establishment of home gardens.

Farmer families can quickly incorporate traditional vegetables in their farming systems. Several studies have confirmed the cost-effectiveness of seed kit distribution and home garden projects for nutrition and improving gender equality in rural households - https://doi.org/10.1079/PHN2003595. WorldVeg home garden projects in Bangladesh increased vegetable consumption by 8% (19.3g per capita day) of the household members of farmer families involved https://www.tandfonline.com/doi/full/10.1080 /19439342.2016.1231704. WorldVeg home garden projects in Cambodia show that farmer families save GBP 186 per year on vegetable consumption or earn this money by selling the produced vegetables (data not yet published).

On the basis of these figures, a conservative estimate can be made. Considering that each of the 200 involved Malagasy women farmer would earn or save at least 100 GBP/year by growing traditional vegetables then this sums up to 20,000 GBP/year.
Considering a multiplier effect of 5 because of farmer-to-farmer exchange, the value would be 100,000 GBP/ year. Link to existing school garden activities would multiply the value to 200,000 GBP/year generated

by this project. Expected value would be much higher because the project promotes commercial production of traditional vegetables rather than home gardens. To scale project results and reach thousands of small-scale farmers, commercial seed production is promoted with support of the seed company SEMANA.

The project will have a non-quantifiable, lasting impact on the conservation of traditional vegetables in Madagascar because at least 400 landraces will be conserved ex situ by WorldVeg and eventually backed up in the Svalbard Global Seed Vault. The seed of these landraces will be made available for breeders, scientists, and farmers under the conditions as agreed with the Malagasy authorities.

Q28. Capital items

If you plan to purchase capital items with Darwin funding, please indicate what you anticipate will happen to the items following project end.

No plan to purchase capital items

Q29. Match funding (co-financing)

Are you proposing co-financing?

⊙ Yes

Secured

Provide details of all funding successfully levered (and identified in the Budget) towards the costs of the project, including any income from other public bodies, private sponsorship, donations, trusts, fees or trading activity, as well as any your own organisation(s) will be committing.

Donor Organisation	Amount	Currency code	Comments
None	0	GBP	No match funding is secured at the moment. Please see the unsecured section.
No Response	*No Response*	*No Response*	*No Response*
No Response	*No Response*	*No Response*	*No Response*
No Response	*No Response*	*No Response*	*No Response*

Unsecured

Provide details of any co-financing where an application has been submitted, or that you intend applying for during the course of the project. This could include co-financing from the private sector, charitable organisations or other public sector schemes.

Date applied for	Donor Organisation	Amount	Currency code	Comments

30 April 2019	BMZ		GBP	These funds cannot yet be secured because they are confirmed and allocated on a year-by-year basis by BMZ, the core donor of the WorldVeg genebank in Arusha Tanzania.
30 April 2020	BMZ		GBP	These funds cannot yet be secured because they are confirmed and allocated on a year-by-year basis by BMZ, the core donor of the WorldVeg genebank in Arusha Tanzania.
30 April 2021	BMZ		GBP	These funds cannot yet be secured because they are confirmed and allocated on a year-by-year basis by BMZ, the core donor of the WorldVeg genebank in Arusha Tanzania.
No Response	*No Response*	*No Response*	*No Response*	*No Response*

Do you require more fields?

⊙ No

Q30. Financial Risk Management

Explain how you have considered the risks and threats that may be relevant to the success of this project, including the risks of fraud or bribery.

Partners selected to collaborate in the project implementation are legitimate and legally-sound organizations. Collaborations will be sealed with formal agreements that are legally binding and contain clauses on anti-fraud and corruption, audit and review and prohibited use of funds to minimize such risks and threats. Furthermore, transfer of payments to collaborators is to be done in multiple instalments with a requirement to report statement of expenditures with certified copy of supporting documentations. At

least 80% of the funds transferred has to be spent prior to request for subsequent transfers. WorldVeg employs independent external entities to annually audit its financial status and health. Annual financial statements are publicly available in WorldVeg's website https://avrdc.org/financial-statements/

Section 15 - FCO Notifications

Q31. FCO Notifications

Please put an X in the box if you think that there are sensitivities that the Foreign and Commonwealth Office will need to be aware of should they want to publicise the project's success in the Darwin competition in the host country.

Unchecked

Please indicate whether you have contacted your Foreign Ministry or the local embassy or High Commission (or equivalent) directly to discuss security issues (see Guidance Notes) and attach details of any advice you have received from them.

⊙ Yes, written advice

Email communication FCO Madagascar
03/12/2018
08:50:09
pdf 115.78 KB

Section 16 - Certification

Q32. Certification

On behalf of the

Company

of

World Vegetable Center

I apply for a grant of

£319,800.00

I certify that, to the best of our knowledge and belief, the statements made by us in this application are true and the information provided is correct. I am aware that this application form will form the basis of the project schedule should this application be successful.

(This form should be signed by an individual authorised by the applicant institution to submit applications and sign contracts on their behalf.)

- **I have uploaded CVs for project principals and letters of support.**
- **I have uploaded our most recent signed audited/independently verified accounts and**

annual report.

Checked

Name	DAVID W JOHNSON
Position in the organisation	DEPUTY DIRECTOR GENERAL - RESEARCH
Signature (please upload e-signature)	Certification page WorldVeg 03/12/2018 08:52:54 pdf 263.98 KB
Date	28 November 2018

Section 17 - Submission Checklist

Stage 2 Application - Checklist for submission

	Check
Have you read the Guidance (including Guidance for Applicants and Finance for Darwin and IWT Guidance)	Checked
Have you read, and can you meet, the current Terms and Conditions for this fund?	Checked
Have you provided actual start and end dates for your project?	Checked
Have you provided your budget based on UK government financial years i.e. 1 April – 31 March and in GBP?	Checked
Have you checked that your budget is complete and correctly adds up?	Checked
Has your application been signed by a suitably authorised individual?	Checked
Have you uploaded a 1 page CV for all the Project Staff on this project, including the Project Leader?	Checked
Have you uploaded a letter of support from the main partner(s) organisations?	Checked
Have you included a cover letter from the lead organisation, outlining how any feedback received at Stage 1 has been addressed?	Checked
Have you been in contact with the FCO in the project country/ies and have you included any evidence of this?	Checked
Have you uploaded a signed copy of the last 2 years annual report and accounts for the lead organisation?	Checked

Have you checked the Darwin website to ensure there are no late updates?	Checked
Have you read and understood the Privacy Notice on GOV.UK?	Checked

We would like to keep in touch! Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under the Darwin Initiative and our sister grant scheme, the IWT Challenge Fund. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our quarterly project newsletter. You are free to unsubscribe at any time.

Checked

Data protection and use of personal data

Information supplied in this application form, including personal data, will be used by Defra as set out in the latest copy of the Privacy Notice for Darwin, Darwin Plus and the Illegal Wildlife Trade Challenge Fund available **here**. This Privacy Notice must be provided to all individuals whose personal data is supplied in the application form. Some information, but not personal data, may be used when publicising the Darwin Initiative including project details (usually title, lead organization, location, and total grant value) on the GOV.UK and other websites.

Information relating to the project or its results may also be released on request, including under the 2004 Environmental Information Regulations and the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality nor will we act in contravention of our obligations under the General Data Protection Regulation (Regulation (EU) 2016/679).