Applicant: **Rwomushana, Ivan**
Organisation: **CABI**
Funding Sought: **£501,479.00**

DIR28S2\1050

Protecting biodiversity through biocontrol of papaya mealybug in East Africa

Papaya mealybug (PMB) invaded East Africa between 2016 - 2020, causing 57% yield and £2,224/ha household economic losses annually. Farmers manage PMB using highly hazardous pesticides, thus harming native insect biodiversity. A more ecologically sound climate smart approach is biological control using the parasitoid, Acerophagus papayae. Biological control espouses sustainable pest control and the biodiversity protection/conservation nexus. This project proposes to release A. papayae as part of the Integrated pest management for PMB and to protect East Africa's native biodiversity.

PRIMARY APPLICANT DETAILS

Title	Dr
Name	Ivan
Surname	Rwomushana
Organisation	CABI
Website (Work)	[redacted]
Tel (Mobile)	[redacted]
Email (Work)	[redacted]
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Section 1 - Contact Details

PRIMARY APPLICANT DETAILS

Title	Dr
Name	Ivan
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Organisation	CABI
Website (Work)	[redacted]
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Address	[redacted]

GMS ORGANISATION

Type	**Organisation**
Name	CABI
Phone (Work)	[redacted]
Email	[redacted]
Address	[redacted]

Section 2 - Title, Ecosystems, Approaches & Summary

Q3. Title:

Protecting biodiversity through biocontrol of papaya mealybug in East Africa

What was your Stage 1 reference number? e.g. DIR28S1\1123

DIR28S1\1303

Q4. Key Ecosystems, Approaches and Threats

Select up to 3 biomes that are of focus, up to 3 conservation actions that characterise your approach, and up to 3 threats to biodiversity you intend to address, from dropdown lists.

Biome 1

Intensive land-use systems (agric., plantations and urban)

Biome 2

Tropical-subtropical forests

Biome 3

Savannas and grasslands

Conservation Action 1

Land/water management (area, invasive control, restoration)

Conservation Action 2

Species management (harvest, recovery, re-introduction, ex-situ)

Conservation Action 3

Education & awareness (incl. training)

Threat 1

Invasive & other problematic species, genes & diseases

Threat 2

Agriculture & aquaculture (incl. plantations)

Threat 3

No Response

Q5. Summary

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 the website.

Please write this summary for a non-technical audience.

Papaya mealybug (PMB) invaded East Africa between 2016 - 2020, causing 57% yield and £2,224/ha household economic losses annually. Farmers manage PMB using highly hazardous pesticides, thus harming native insect biodiversity. A more ecologically sound climate smart approach is biological control using the parasitoid, Acerophagus papayae. Biological control espouses sustainable pest control and the biodiversity protection/conservation nexus. This project proposes to release A. papayae as part of the Integrated pest management for PMB and to protect East Africa's native biodiversity.

Section 3 - Title, Dates & Budget Summary

Q6. Country(ies)

Which eligible host 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	Kenya	**Country 2**	South Sudan
Country 3	Uganda	**Country 4**	*No Response*

Do you require more fields?

⦿ No

Q7. Project dates

Start date:	End date:	Duration (e.g. 2 years, 3 months):
01 June 2022	31 March 2025	2 years, 10 months

Q8. Budget summary

Year:	2022/23	2023/24	2024/25	Total request
Amount:	£163,675.00	£168,989.00	£168,815.00	**£** 501,479.00

Q9. Proportion of Darwin Initiative budget expected to be expended in eligible countries: % [redacted]

Q10a. Do you have matched funding arrangements?

⦿ Yes

What matched funding arrangements are proposed?

(1) CABI PlantwisePlus contribution of [redacted] in staff and direct costs for the parasitoid modelling work in UK; (2) Bench fees for use of the mass rearing facility for Acerophagus papayae production at the KALRO Muguga for 2 years, 10 months (34 months) at [redacted] /month amounting to [redacted]; (3) refurbishment and equipping of the mass rearing facility at NARO-Uganda and University of Juba amounting to [redacted] from CABI PlantwisePlus; (4) Waiver of hiring charges for use of KEPHIS, KALRO, NMK, UoJ vehicles amounting to [redacted]; (5) In-kind weekends overtime by KEPHIS, KALRO, NMK and UoJ amounting to [redacted] (6) In-kind contribution by all partners such as office space, laboratory, museum storage of [redacted].

Q10b. Total confirmed & unconfirmed matched funding (£) [redacted]

Q10c. If you have a significant amount of unconfirmed matched funding, please clarify how you fund the project if you don't manage to secure this?

No Response

Section 4 - Problem statement

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?

Please cite the evidence you are using to support your assessment of the problem (references can be listed in your additional attached PDF document which can be uploaded at the bottom of the methodology page).

Since the first report of papaya mealybug (PMB), Paracoccus marginatus, in Kenya in 2016 (Macharia et al., 2017), this invasive pest of American origin has rapidly spread in the greater East African region, to neighbouring Uganda and the fragile state of South Sudan (Gama et al., 2020; Nankinga et al., unpubl, 2021). A CABI study predicted that if not sustainably managed, PMB would continue to rapidly spread into novel areas in East Africa (Finch et al., 2020). This pest causes a 57% yield loss on papaya, resulting in household economic losses of £2,224/ha annually. Farmers spray up to 16 times in a season to control PMB, using highly hazardous WHO class II and 1b pesticides (Kansiime et al., 2020). Excessive use of pesticides negatively impacts insect biodiversity by eliminating native pollinators and natural enemies of pests (Geiger et al., 2020). Only 70-90% of ground applied pesticides reach their target, with the remainder having these unintended consequences on insect biodiversity. Subsequently, pesticides are reported to be the second most important driver for the worldwide decline in insect populations (Sánchez-Bayo & Wyckhuys, 2019). Anecdotal evidence suggests that production of cucurbits and avocado, crops heavily reliant on insect pollination has been declining where pesticides are widely used against PMB. Resource-limited smallholder farmers, especially women, are most affected by biodiversity loss as they are most directly dependent on insect pollinators for their crop production. A biological control approach provides sustainable management of pests, while protecting insect biodiversity in crops, supporting greater yield, and reducing reliance on pesticides. Classical biological (CBC) control of PMB has been identified through stakeholder activities under a Darwin funded project that highlighted the lack of sustainable control measures, which led to farmers relying on pesticides, sometimes in untrialled cocktails, and getting caught on a “pesticide treadmill”. Kenyan regulators therefore issued a permit to release the parasitoid, after laboratory parasitism of 77.5 %, 72.5 % and 47.5 % in adult females, third and second instars respectively was established. A recent baseline study by CABI in Kenya (Constatine et al, unpublished) showed that 85% of farmers viewed the release of a biological control agent to manage PMB positively (11% and 3% held neutral or negative views, respectively), and most farmers (94%) would support a biological control programme for PMB in their community. CABI has also received requests from Uganda and South Sudan to expand the release of the parasitoid to these countries. Therefore this regional initiative will seek to control PMB in the greater East Africa, thereby reducing the heavy reliance on pesticides and thus protecting native insect diversity and ensuring a healthier ecosystem. There is a high probability of success as studies show that withdrawal of pesticide applications against PMB has positive benefits to biodiversity, increasing the natural enemy complex for other pests in small scale papaya farming systems (Regupathy & Ayyasamy R, 2011), and release of. A. papayae saved farmers and consumers $121 million to $309 million in the first year alone (Myrick et al., 2013).

Section 5 - Darwin Objectives and Conventions

Q12. Biodiversity Conventions, Treaties and Agreements

Q12a. Your project must support the commitments 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.

- ☑ Convention on Biological Diversity (CBD)
- ☑ Global Goals for Sustainable Development (SDGs)

Q12b. National and International Policy Alignment

Please detail how your project will contribute to national policy (including NBSAPs, NDCs, NAP etc.) and in turn international biodiversity and development conventions, treaties and agreements that the country is a signatory of.

This project addresses the CBD objective to “conserve biodiversity” through the use of Classical Biological Control (CBC), which provides an eco-friendlier pest control alternative to pesticides which can be harmful to non-target organisms. The efficacy of CBC for the management of invasive alien species (IAS) has been recognised by COP13 Decision XIII. CBD guidelines will be followed for the introduction of A. papayae including International Standards of Phytosanitary Measures (ISPM) 3 that provides the phytosanitary measures applicable for safe use of biocontrol agents and other beneficial organisms. Kenya, South Sudan and Uganda are contracting parties to the International Plant Protection Convention (IPPC), represented by the National Plant Protection Organizations namely; Kenya Plant Health Inspectorate Service (KEPHIS), Ministry of Agriculture and Food Security and Ministry of Agriculture Animal Industry and Fisheries, respectively. CABI has completed undertaking pest risk assessments of A. papayae in Kenya in partnership with Kenya Agricultural and Livestock Research Organisation (KALRO) and KEPHIS, and has obtained approval to release the parasitoid in the country.

The risk assessments for Kenya will be used to obtain approval for release in the rest of the East African project countries using regionally harmonized protocols.

The CBC programme will make use of genetic resources from a jurisdiction in West Africa where A. papayae was released in 2010 (Goergen et al., 2014). CABI has obtained the requisite jurisdiction export permits, and recipient jurisdiction phytosanitary and import permits for the transboundary movement of papaya mealybug (PMB) to Kenya, and will do the same for South Sudan and Uganda following ISPM 3. It is noted that CBC of PMB has little recoverable monetary benefit to the originating country and will become a regional public good once established. However, there will be other benefits to East African farmers through reduced contamination from pesticides, protection of existing non-target biodiversity from harmful chemicals, and sustainable control of PMB. Non-monetary benefits will also include capacity building of farmers and protection of other natural enemies and beneficial invertebrates.

This project also aims to deliver on the Aichi Biodiversity Targets of the three countries namely; IAS and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment. The National Biodiversity Strategy and Action Plans for the three countries (Kenya 2019-2030), South Sudan (2018-2027) and Uganda (2015-2025) recognise invasive species such as PMB as serious threats to native plants, animals, and pastures. The different IPPC focal points in the three countries will be invited to be part of the advisory panel for the project to provide oversight

Section 6 - Method, Change Expected, Gender & Exit Strategy

Q13. Methodology

Describe the methods and approach you will use to achieve your intended Outcome and contribute towards your Impact. Provide information on:

- **How you have analysed historical and existing initiatives and are building on or taking work already done into account in project design. Please cite evidence where appropriate.**
- **The rationale for carrying out this work and a justification of your proposed methodology.**
- **How you will undertake the work (materials and methods).**
- **How you will manage the work (roles and responsibilities, project management tools, etc.).**

Ecological modelling shows that East Africa is becoming more suitable for PMB with the changing climate, resulting in rapid proliferation in Kenya, South Sudan and Uganda. There is a high probability of success as A. papayae released in 1ha can spread to 50 hectares in 3 months. Studies in India show that withdrawal of pesticide applications against PMB had positive benefits to biodiversity, increasing the natural enemy complex for other pests in small-scale papaya farming systems (Regupathy & Ayyasamy R, 2011). Acerophagus papayae also reduced PMB infestations by 99.7%, 97% and 99% in Dominican Republic, Puerto Rico and Guam, respectively. The release of A. papayae in India saved farmers and consumers $121 million to $309 million respectively, in the first year alone (Myrick et al., 2013). CABI has conducted laboratory studies that established parasitism of 77.5 %, 72.5 % and 47.5 % in adult females, third and second instars respectively, with similar results expected in the field. CABI has implemented classical biological of PMB in Pakistan using A. papayae, and will leverage on the rich experience in East Africa.

Our methodology combines biological and socio-economic research to address the current management practices for PMB that are driving biodiversity loss, although a climate resilient solution that would increase productivity, incomes, food and nutritional security of papaya smallholder growers at a landscape scale exists elsewhere. This project aligns with the Darwin Initiative aims — rates of biodiversity loss and degradation are slowed, halted or reversed, and poverty reduced in developing countries — by using biological control to achieve biodiversity protection-poverty reduction win-win. The following activities shall be undertaken to address the regional PMB and biodiversity threat;

Lack of sustainable pest control measures for P. marginatus has led farmers to resort to chemical pesticides which is detrimental to native insect biodiversity. This will be addressed by:
- Using ecological niche modelling to establish the environmental suitability of A papayae across East Africa and identify the optimal release areas sites
- Undertaking a baseline study at selected “biological control learning sites” to determine the native insect biodiversity under farmers practices
- Conducting area-wide field releases of A. papayae at “biological control learning sites” in East Africa, deploying technology

such as drones where feasible, and monitoring establishment, efficacy and parasitoid range expansion post-release.
- Establishing A. papayae reservoirs on farmers' fields for mass rearing of the parasitoid for augmentative releases, and strengthening the skills of farmers to produce the parasitoid insitu during naturalization that ensures long-term sustainability of pest control - biodiversity nexus.

Lack of capacity to manage PMB particularly for women farmers. This will be addressed by:
- Conducting training at the local level and cross-regional experiential visits to increase awareness about the value of insect biodiversity, and how biocontrol could aid in overall system productivity increases and livelihoods, targeting farmers, extension officers and community members.

Lack of sufficient data to assess and quantify impacts of pests and pesticides on livelihoods and biodiversity. This will be addressed by building an evidence base for classical biological control and the biodiversity conservation nexus by:
- Conducting regular field surveys to document any negative impacts of the classical biological control agent on non-target scale insects
- Undertaking field surveys in the 3 East African countries to determine the impacts of the parasitoid on yield and incomes of smallholder farmers following its release and naturalization, and on other insect pollinated crops such as cucurbits and avocado.
- Conducting studies in different papaya agro-ecologies (pre and post release) to establish the effect of pesticide use on native insect biodiversity, comparing abandoned and severely infested fields, infested but yielding fields with and without the parasitoid, and fields with farmers pesticide practices and generate data of biodiversity changes.

Lack of knowledge to manage PMB and the pest control - biodiversity conservation nexus (and its impact on smallholder income); This will be addressed by:
- Developing and disseminating information on appropriate management tools for PMB, with increased emphasis on climate-smart practices, biocontrol and biodiversity conservation, using novel communication approaches targeting men and women farmers
- Conducting in-country and East Africa regional stakeholder workshops for extension officers, researchers, policy makers and general public to create awareness about the concept of biological control as an international public good and the nexus with biodiversity conservation, and developing regional harmonized release approaches.

A Project Board comprising senior members of the partner organisations, with IPPC focal points as advisors will be constituted with responsibility of quality assurance and ensuring project activities and milestones are met.

Q14. Capability and Capacity

How will you support the strengthening of capability and capacity in the project countries at organisational or individual levels, please provide details of what form this will take and the post-project value to the country.

The project will have a strong capacity building component, targeting different stakeholder categories. At the district and county levels, the project partners will train farmers and agricultural extension officers through training-of-trainers (ToTs) and farmer workshops to enhance their knowledge on biological control on insect pests. CABI and partners will further support the trainers to pass on the knowledge to more farmers, thus ensuring scaling out and up for wider outreach about biological control at the national level. Various training approaches such as the use of farmer field schools (FFS) and biological control learning sites will be employed. Through all the trainings, there will be an effort to ensure gender equity by deliberately involving women, youth and vulnerable groups to benefit from acquisition of the knowledge. CABI will provide dedicated training and information materials such as practical manuals and handouts which farmers and extension officers will use beyond the project to spread environment-friendly practices and methods to develop pest-resilient agroecosystems.

A specific module for classical biological control modules will also be embedded in the curricula for CABIs plant doctors, particularly in Kenya and Uganda where this concept exists. This module will also be provided regionally through the Centre of Phytosanitary Excellence hosted by KEPHIS – Kenya`s NPPO, to offer capacity to African countries` phytosanitary and plant health practitioners to conceptualize the biological control - biodiversity conservation nexus. Key stakeholders from the three countries will be supported to spend some time at COPE undertaking training on the same, and take the lessons back to their countries.

Q15. Gender equality

All applicants must consider whether and how their project will contribute to reducing inequality between persons of different gender. Explain how your understanding of gender equality within the context your project, and how is it reflected in your plans.

Women are highly involved in the production of papaya in East Africa, and more likely to be highly impacted by papaya mealybug (PMB) because of limited access to information, labour and finance to use conventional control methods. A study on impacts of PMB showed that women incurred higher economic losses due to the pest, and their papaya productivity was 48% less than that for men, resulting from differences in access to resources, credit and labour and use of management practices. The biocontrol of PMB will be beneficial to women farmers by reducing the labour and cost of using chemical pesticides to control the pest. Bological control is an international public good and involves area-wide release of parasitoids, accessible to both men and women without additional costs and labour. The project will carry out surveys to better understand participation, benefits and impediments to both women and men's participation in project activities such as insitu rearing of A. papayae employing gender disaggregated data. We will particularly try to understand how the application and use of biological control for pest control affects women and men farmers' time, labour and income and draw out lessons on how to better enhance equitable gender outcomes across the three countries. It will categorize women into women farmers in male headed households and women farmers heads of households, to understand the impacts on different groups of women and make recommendations. The communication and awareness raising about biological control will include diverse strategies aimed at reaching different groups of women farmers as well as men farmers. Capacity building for vulnerable and less advantageous groups (including women and youth) will also be given priority throughout the project implementation. Additionally, 9 (75%) of the key project implementers from partner organizations are women.

Q16. Awareness and understanding

How will you raise awareness and understanding of biodiversity-poverty issues in your stakeholders, including who are your stakeholders, what approaches/formats/products will you use, how you will ensure open and free access to all data, and how will you know that the messages are understood?

The primary target of the communication activities will be smallholder farmers growing papaya (at least 50% women), who will receive information on classical biocontrol of P. marginatus and conservation biocontrol approaches to enhance biodiversity management. Extension networks, researchers, project partners and policy makers will be targeted with information on the biocontrol-biodiversity conservation nexus contributing to an ever-growing preparedness for the actors ton this concept. In order to reach specific target groups, different dissemination activities and communication material will be adopted.

Dissemination activities:
Altogether at least four dissemination events will be held during the project:
i) Kick-off East Africa regional meeting to inform key stakeholders of the project and implementation plan.
ii) Policy engagement meeting to share project results, discuss policy requirements, and develop a road map for scaling up results to the region and local levels.
iii) Scientific conferences to present project results for wider adoption to different contexts.
iv) Closing meeting aimed at disseminating project outputs and results in a clear, well-structured and easily understandable way.

Communication tools:
Communication tools will be developed to reach scale of information dissemination. A gendered formative research will be undertaken in target project areas to understand communication needs and appropriate tools for reaching men and women farmers, to guide design of materials and selection of channels to use. The following will be considered:
• Fact sheets for farmers presenting classical biocontrol of papaya mealybug, in situ conservation of the parasitoid, and conservation biocontrol of pests.
• Project webpage and social media communications aimed at reaching researchers, policy makers, academia and the general public.

Hosted media programs and publication of articles in the traditional media, magazines and bulletins that represent a good platform for the dissemination of project results aimed at reaching farmers, key project stakeholders and the general public.

Q17. Change expected

Detail the expected changes to both biodiversity and poverty reduction, and links between them, 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).

When talking about how people will benefit, please remember to give details of who will benefit, differences in benefits by gender or other layers of diversity within stakeholders, and the number of beneficiaries expected. The number of communities is insufficient detail – number of households should be the largest unit used.

The project will mitigate the negative impacts of untargeted pesticide application for papaya mealybug on crop yield and natural enemy biodiversity. Applying an integrated pest management (IPM) will reduce pesticide use and associated costs, improve papaya yields and protect the native biodiversity (Meyerdirk et al, 2004; Muniappan et al, 2006).

Short term benefits
1) Nearly15,000 smallholder farmers, community members and the general public will gain novel understanding of classical and conservation biological practices for crop pests
2) A 5% percent increase in distribution and abundance of native insect biodiversity in areas where A. papayae has established will be attained
3) Nearly 3,000 smallholder farmers will directly benefit from the release of A. papayae on their farms through better management of PMB
4) On at least 3000 smallholder farms, yield losses related to inappropriate control of PMB through indiscriminate pesticide use (which exacerbates pest problems) will decrease to less than 20%
5) A 50% reduction in the frequency of pesticide spraying and pesticides expenditure on smallholder farms will be achieved
6) Targeted application of biological control over wide areas will result in release 300,000 A. papayae individuals (100,000/country). Estimates of 250 parasitoids per hectare spreading to 50 hectares in 1-3 years have been projected. A conservative estimate of 75,000 hectares is projected for area that papaya mealybug is sustainably controlled and biodiversity enhanced.

Long term benefits
1) Incomes for impacted smallholder farmers will increase by 40% due to better quality produce fetching better prices and savings from reduced pesticide use
2) A reduction in pesticide use will positively impact beneficial invertebrates, soil organisms, and species higher up the food chain, leading to increased diversity and abundance of these species in papaya growing agro-ecosystems. A reduction in pesticides will also have a positive impact on the local groundwater quality and health of farmers from reduced spraying
3) There will be a positive benefit to cost ratio from classical biological control from the investment, as has been shown in similar programmes in Africa such as against the cassava mealybug, where an extremely high benefit to cost ratio (149:1) was obtained. In Ghana, the classical biological control intervention of papaya mealybug using A. papayae, within the period 2011 and 2013 yielded an aggregate level total economic surplus of £2.0 million, with producers and consumers benefiting to a tune of £1.1 million and £0.97 million respectively, at an estimated intervention cost of £0.12 million (Offei et al, 2015). In India, the annual economic benefits for the five most important crops affected by the biocontrol program ranged from $121 million to $309 million, and the net present value of benefits over five years totalled $524 million to $1.34 billion (Myrick et al, 2013). Similarly for the three East African countries, positive economic benefits are anticipated once the parasitoid establishes

Q18. Pathway to change

Please outline your project's expected pathway to change. This should be an overview of the overall project logic and outline how you expect your Outputs to contribute towards your overall Outcome and, longer term, your expected Impact.

The extent to which smallholder farmers can implement sustainable practices for pest control is limited by many factors including; lack of effective pest control technologies, lack of access to actionable information and capacity to implement, and inadequate incentives for adoption. Agricultural stakeholders also lack capacity to quantify impacts of pests on households and the environment. Consequently, smallholder farmers continue to incur crop losses related to inappropriate and indiscriminate pesticide use, which exacerbates pest problems, affecting their food security and biodiversity. This project aims to achieve sustainable and environmentally friendly management of PMB in the East Africa region, thus supporting food security and protecting biodiversity. We will promote classical biocontrol of P. marginatus

using an introduced parasitoid, A. papayae in Kenya, South Sudan and Uganda, to serve as a scalable model for sustainable management of the pest in other affected countries including Tanzania and Burundi. Capacity of farmers and extension agents will be strengthened for conservation and augmentative release of A. papayae, along with climate-smart conservation practices, providing long term benefits to households and the environment. Socio-economic and biological impact assessments, and communication activities will be implemented, further providing information necessary for implementing sustainable pest management practices.

Q19. Exit Strategy

How the project will reach a sustainable point and continue to deliver benefits post-funding? Will the activities require funding and support from other sources, or will they be mainstreamed in to "business as usual"? How will the required knowledge and skills remain available to sustain the benefits? How will your approach, if proven, be scaled?

A key aspect of our projects' sustainability shall be stakeholder involvement and feedback. We will establish new and further strengthen existing strategic partnerships with stakeholders and community members in the target countries at an early stage of project implementation, to ensure stronger involvement in decision-making, particularly as biological control is a self-perpetuating method of pest control, and needs community buy-in to conserve the natural enemies. A recent baseline study by CABI in Kenya (unpublished) showed that 85% of farmers viewed the release of a biological control agent to manage PMB positively (11% and 3% held neutral or negative views, respectively), and most farmers (94%) would support a biological control programme for PMB in their community. Farmers expressed own willingness to be involved in monitoring natural enemies and PMB levels on their farms, attending community meetings, reducing their chemical pesticides use, monitoring natural enemy and PMB levels at the community level, adopting practices to support natural enemy establishment, taking on lead farmer roles and using their farms as demonstration plots. We will engage especially with the local government administration to closely align the project to their strategic plans on pest control. A well-elaborated communication strategy will enable the project team to share results and ensure buy-in at community level and policy makers in each country. The training of community members in in-situ multiplication of the parasitoid and release in their field will ensure that a sustainable knowledge base on biological control remains at the community level when the project completes. Community-based feedback mechanisms that enable the project team to review the activities in a bottom-up manner and to respond to emerging issues from the field experiences will promote sustainability. We will further leverage on existing synergies and projects within the release areas to extend our reach for instance PlantwisePlus.

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

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pdf 4.47 MB

Section 7 - Risk Management

Q20. Risk Management

Please outline the 6 key risks to achievement of your Project Outcome and how these risks will be managed and mitigated, referring to the Risk Guidance. This should include at least one Fiduciary, one Safeguarding, and one Delivery Chain Risk.

Projects should also draft their initial risk register using the Risk Assessment template provided, and be prepared to submit this when requested if they are recommended for funding. Do not attach this to your application.

Risk Description	Impact	Prob.	Gross Risk	Mitigation Header	Residual Risk

Fiduciary Exchange rate fluctuations across 3 local currencies and unacceptable reporting by partners due to institutional policies	Moderate	Unlikely (>5%< 20%)	Moderate	The lead institution will maintain operating currency to GBP. Partner accountants will be trained on good financial management practice at the onset of the project, and spot checks done regularly. Partners will use own-institutional financial policies where applicable. An audit will be conducted when the project ends.	Minor
Safeguarding Partners compliance with General Data Protection Regulations (GDPR)	Minor	Unlikely (>5%< 20%)	Minor	Data collected in the course of implementation by all partners will be upheld using key GDPR principles. Partners will be trained on the principles of GDPR by CABI experts.	Minor
Delivery Chain Securing regulatory approvals for parasitoid releases in South Sudan and Uganda	Moderate	Unlikely (>5%< 20%)	Moderate	Data from the risk assessments done in Kenya will be availed to the competent authorities in South Sudan and Uganda for purposes of securing release permits. The programme will be premised on regional cooperation and aligned to priorities and strategic plans on invasive species and biodiversity.	Minor
Risk 4 Covid-19 requirements of the project countries restricting travel to project sites for implementation and increasing costs	Moderate	Unlikely (>5%< 20%)	Moderate	National partners have been identified in each country and will take lead on national level activities. For regional meetings, all partners will be required to be vaccinated. Sufficient budget will be provided for Covid-19 testing for travel.	Minor
Risk 5 Cultural barriers in accepting the classical biological control agent, but not to the extent that growers would be reticent to uptake the technology given the PMB menace	Insignificant	Unlikely (>5%< 20%)	Minor	The project shall seek Prior Informed Consent (PIC) from every community before the release of the parasitoid. Stakeholder awareness will be done in each community prior to introduction of the agent to educate them on the technology.	Minor
Risk 6 Anticipated matched funding not materializing in time	Minor	Unlikely (>5%< 20%)	Minor	Matched funding from partners will be denominated as in-kind contribution whenever possible. The matched funding from CABI has been secured, and will to a large extent be used in Kenya thereby dedicating a larger portion of the Darwin funding to South Sudan and Uganda.	Minor

Section 8 - Implementation Timetable

Q21. Provide a project implementation timetable that shows the key milestones in project activities

Provide a project implementation timetable that shows the key milestones in project activities. Complete the Word template as appropriate to describe the intended workplan for your project.

Implementation Timetable Template

Please add/remove 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.

R28_Darwin_Implementation_Timetable_Template_24 Jan 2022
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Section 9 - Monitoring and Evaluation

Q22. Monitoring and evaluation (M&E)

Describe 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 Guidance**).**

CABI will lead the overall Monitoring and Evaluation (M&E) process, ensuring that project activities are on track and outputs are delivered on time. A monitoring and evaluation plan will be developed at the inception to spell clearly the milestones, outputs and measurable indicators of project progress. CABI's M&E Manager will follow this M&E plan to make sure that milestones and deliverables are met, assessing progress against output indicators from the Logframe. A dedicated Project Board will meet every 6 months to review progress based on the M&E plan, communicate on progress, allowing the project team to make any adjustments which may be needed to successfully deliver the outcome in consultation with the Darwin Secretariat.

Initial and final biological and socio-economic surveys will be undertaken to assess changes in knowledge, perceptions and practices, including gender-based roles in pest management by smallholder farmers; pest control practices used by women and men farmers; and impacts of the project on biodiversity and livelihoods of smallholder farmers. The partners will monitor the establishment and spread of the parasitoid A. papayae that includes multiple sampling sites along key farm intensification gradients, and generate an inventory of native invertebrate diversity in papaya agro-ecosystems, contributing to the national lists. The observed diversity and abundance of native insect species in and around the release sites, will be used to document the impact of the project on native biodiversity in the papaya growing systems.

All gathered data will be analysed and used to write the necessary technical reports. These reports, in addition to periodic reports by all partners, will be used to monitor and evaluate continuously the technical value of the project, its impact on livelihoods and the influence it is having on restoring native biodiversity where it has been damaged

Total project budget for M&E in GBP (this may include Staff, Travel and Subsistence costs)	[redacted]
Percentage of total project budget set aside for M&E (%)	[redacted]
Number of days planned for M&E	60

Section 10 - Logical Framework

Q23. Logical Framework

Darwin Initiative projects will be required to monitor and report against their progress towards their Outputs and Outcome. 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.

- Stage 2 Logframe Template

Please complete your full logframe in the separate Word template and upload as a PDF using the file upload below. – **please do not edit the template structure other than adding additional Outputs if needed as a logframe submitted in a different format may make your application ineligible**. Copy your Impact, Outcome and Output statements and your activities below - these should be the same as in your uploaded logframe.

Please upload your logframe as a PDF document.

- R28_Darwin_St2_Logical_Framework_Template_24 Jan 2022
- 26/01/2022
- 15:32:13
- pdf 43.74 KB

Impact:

Sustainable management of papaya mealybug achieved in East Africa through biological control thereby enhancing livelihoods and protecting native insect biodiversity threatened by pesticide use

Outcome:

East Africa will have an increased regional capacity to manage papaya mealybug using climate-smart biocontrol thereby reducing the risk of native insect biodiversity loss and increasing incomes of farmers

Project Outputs

Output 1:

The A. papayae parasitoid released and naturalized in East Africa for the sustainable biological control of papaya mealybug and protection of native insect biodiversity

Output 2:

Capacity of crop inspectors, small-holder farmers, extension providers and the general public enhanced on in situ management of A. papayae to support sustainable management of papaya mealybug and biodiversity conservation

Output 3:

Scientific evidence base generated on impacts of classical biological control of A. papayae on livelihoods and native insect biodiversity

Output 4:

Information on classical biocontrol of papaya mealybug and conservation biocontrol approaches to support natural pest regulation and better management of biodiversity packaged and disseminated to increase farmer knowledge and technology adoption

Output 5:

No Response

Do you require more Output fields?

It is advised to have fewer 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, 1.3 are contributing to Output 1.

1.1: Conduct ecological niche modelling to evaluate the environmental suitability for A. papayae across East Africa to identify potential release areas
1.2: Undertake a baseline study at selected biological control learning sites to determine the native insect biodiversity under farmers practices
1.3: Conduct area-wide releases of A. papayae in Kenya, South Sudan and Uganda using hand releases and also deploying technology such as drones and landscape scale
1.4: Establish A. papayae reservoirs on farmers' fields for parasitoid mass production in situ for augmentative field releases during naturalization
1.5: Conduct monitoring to determine post-release establishment and parasitoid efficacy as well as expansion outside the release areas
2.1: Train crop inspectors in identification of papaya mealybug and related scale insects, the A. papayae parasitoid and the biological control-biodiversity conservation nexus
2.2: Train extension workers and community facilitators on conservation of A. papayae in the field, to support the process of naturalization
2.3: Train farmers on in situ production of A. papayae in their farms
3.1: Undertake surveys to establish the effect of pesticide use on native insect biodiversity, comparing fields with and without the parasitoid and fields with farmers pesticide practices
3.2: Conduct socio-economic studies to determine the impacts of the CBC approach on the population of papaya mealybug and crop infestation
3.3: Undertake surveys to assess the impacts of A. papayae biological control on yield and incomes of smallholder households
3.4: Generate an inventory of native insect biodiversity pre-and post-release of A. papayae to determine the positive impacts of the classical biological control programme on insect biodiversity
3.5: Conduct surveys to establish impacts of the classical biological control agent on non-target scale insects
4.1: Develop an effective, gender responsive communication plan, integrating multi-channel communication approaches appropriate for reaching men and women smallholder farmers
4.2: Produce and disseminate different information products on targeting different stakeholders on dual purpose - pest control and biodiversity conservation nexus

Section 11 - Budget and Funding

Q24. Budget

Please complete the appropriate Excel spreadsheet, which provides the Budget for this application. Some of the questions earlier and below refer to the information in this spreadsheet. Note that all Darwin Main should be using the over £100,000 template. Please refer to the Finance Guidance **for more information.**

- Budget form for projects over £100k

Please ensure you include any co-financing figures in the Budget spreadsheet to clarify the full budget required to deliver this project.

N.B.: 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.

DIR28S11303-Darwin Round 28 CBC Budget
28/01/2022
13:51:43
xlsx 86.23 KB

Q25. Financial Risk Management

Explain how you have assessed the risks and threats that may be relevant to the successful financial delivery of this project. This includes risks such as fraud, bribery or corruption, but may also include the risk of fluctuating foreign exchange, delays in procurement or recruitment and internal financial processes such as storage of financial data.

CABI has a code of business conduct and is governed by an independent board. CABI implements a risk management strategy, and follows international standards of financial management with an Anti-Fraud Policy and Response Plan, that requires acting honestly and with integrity and refraining from deception, bribery, forgery, extortion, corruption, theft, conspiracy, embezzlement, misappropriation, false representation and accounting (including the falsification of documentation), concealment of material facts and collusion. CABI also has in place a whistle blowing policy.

The Kenya, South Sudan and Uganda partners are national institutions with demonstrated high-standard financial management, accounting and audit systems. CABI has worked with these partners and there is proven evidence that their financial controls are reliable and consistent with international standards. In terms of the engagement with partners, CABI will utilize their existing financial controls, evidenced by invoices and receipts, and will link payments to the actual delivery of specific outputs.

The three East African countries have varied local currencies (KES, UGX and SSD), and exchange rates. Therefore the project account will be operated in CABIs core currency (GBP) to mitigate the risks of exchange losses to the project finances while operating in three different local currencies.

Q26. Funding

Q26a. Is this a new initiative or does it build on existing work (delivered by anyone and funded through any source)?

⦿ Development of existing work

Please provide details:

This project builds on the Darwin funded “Biodiversity and Agriculture: addressing scale insect threats in Kenya project” that identified 30 scale insects, of which papaya mealybug was the most destructive and greatest threat to biodiversity. During 2019/2021, with funding from FCDO and DGIS, CABI conducted three studies; one on crop losses and economic impact associated with papaya mealybug in Kenya that determined that this pest affects 73% of papaya farmers, causing 57% yield loss and household economic losses of £2,224/ha annually, and that 51% of farmers manage this pest using highly hazardous pesticides (Kansiime et al, 2020). CABIs research on potential global distribution of papaya mealybug highlighted potential expansion into novel areas in East Africa, which poses a threat to countries neighbouring Kenya (Finch et al, 2020). Lastly a recent 2021 baseline study showed that 94% of farmers would support a biological control programme for PMB in their community (Constantine et al, Unpublished). Another publication by KEPHIS on

characterization and risk assessment of papaya mealybug in Kenya under changing climate has shown that its potential range is wider than originally thought, exacerbating the threat of the pest throughout the country if not sustainably mitigated (Heya et al, 2020).

Q26b. Are you aware of any current or future plans for similar work to the proposed project?

⦿ Yes

Please give details explaining similarities and differences, and explaining how your work will be additional and what attempts have been/will be made to co-operate with and learn lessons from such work for mutual benefits.

In Kenya, KALRO and CABI have secured approval to release A. papayae, although the funding can only support pilot scale releases at a few sites. Darwin funding would enable the releases to be done at scale and reach more farmers and cover larger hectares of papaya farms, resulting in a greater impact on biodiversity. In Uganda, NARO has conducted a scoping study where farmers in several districts (Luweero, Nakaseke, Wakiso and Kayunga districts) decried the impact of the papaya mealybug problem on their farms, and reported declining productivity in other crops due to over-use of pesticides that could be affecting pollinators (Nakinga et al, 2021 Unpublished report). In South Sudan, the University of Juba has reported this pest to be ravaging 7 counties of Jubek State (Juba, Kator, Rejaf, Luri, Gondokoro, Lokiliri, and Mongalla) and sought collaboration to mitigate its wider spread. Given that CABI has the biological control agent in Kenya and secured a permit for its field release, this provides a good opportunity for regional collaboration to manage this pest while conserving biodiversity that is threatened by excessive pesticide use.

Q27. 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. If you are requesting more than 10% capital costs, please provide your justification here.

No capital items. These have already been financed from a related project and other capital items needed are already in possession by our proposed partners in the project.

Q28. Value for Money

Please describe why you consider your application to be good value for money including justification of why the measures you will adopt will secure value for money.

Classical biological control approaches are low-cost because the agent can continue to multiply and spread on its own once its initially released and established, thus minimal investment is required in long-term mass rearing. About 250 parasitoids released in one hectare can spread to 50 hectares in 3 months, reducing the cost of expensive mass production within a short time after release, in addition to the low-cost field reservoirs to be established at the community level. Estimates of economic impact of classical biological control of papaya mealybug in India from an investment of £367,000 showed that excellent control of papaya mealybug was obtained within five months and pesticide usage was reduced. The annual economic benefits for the biocontrol program on papaya ranged from £11 million in the first year to £48 million over five years (Myrick et al, 2013). Similar trends positive returns from the investment are expected from Kenya. In terms of partnerships, the choice of government institutions maximises value for money; they have regional offices in the project area, and a network of collaborators among smallholder communities, minimising travel and staff costs. Project aims and outcomes match all partners' mandates ensuring more project implementation responsiveness. The project shall leverage capital equipment like the quarantine facility and vehicles from existing initiatives of the partners. In project Monitoring and Evaluation, value for money will be maximised by the integrated involvement of senior scientists of partner institutions in these activities rather than external parties.

Section 12 - Safeguarding and Ethics

Q29. Safeguarding

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, projects are required to have appropriate safeguarding policies in place.

Please confirm the Lead Partner has the following policies in place and that these can be available on request:

Please upload the lead partner's Safeguarding Policy as a PDF on the certification page.

We have a safeguarding policy, which includes a statement of our commitment to safeguarding and a zero tolerance statement on bullying, harassment and sexual exploitation and abuse	Checked
We have attached a copy of our safeguarding policy to this application (file upload on certification page)	Checked
We keep a detailed register of safeguarding issues raised and how they were dealt with	Checked
We have clear investigation and disciplinary procedures to use when allegations and complaints are made, and have clear processes in place for when a disclosure is made	Checked
We share our safeguarding policy with downstream partners	Checked
We have a whistle-blowing policy which protects whistle blowers from reprisals and includes clear processes for dealing with concerns raised	Checked
We have a Code of Conduct for staff and volunteers that sets out clear expectations of behaviours - inside and outside the work place - and make clear what will happen in the event of non-compliance or breach of these standards	Checked

Please outline how you will implement your safeguarding policies in practice and ensure that downstream partners apply the same standards as the Lead Partner. Please highlight any key safeguarding risks, including human rights issues, their assessment and measures to mitigate and manage them.

CABI commits, through its safeguarding policy, to design and undertake its activities in a way that protects people from any risk or harm that may arise from their coming into contact with CABI - including ways in which information about individuals in our programmes is gathered and communicated. CABI also abides by the General Data Protection Regulations (GDPR) and ensures that data collected in the course of running a project is upheld within the key GDPR principles.

CABI's policy is not to collaborate with third parties where there is reasonable suspicion that the partner is complicit in the acts of bribery, fraud or modern slavery and/or where there are failures in safeguarding. We include a safeguarding clause in agreements with partner institutions to communicate our position and expectations of them to uphold the same. Reporting a safeguarding concern includes having an impartial third-party contact for independence. CABI has an appointed safeguarding lead who maintains an incidence log to reflect all cases. These records are used to reflect on vulnerabilities and their mitigations, to learn from safeguarding incidents and to report to relevant authorities where necessary and to donors/funders and other key stakeholders.

Q30. Ethics

Outline your approach to meeting the key ethical principles, as outlined in the guidance.

CABI has adopted a universal ethical code that it expects its scientists to uphold, in conjunction with a code of business conduct. The code of business conduct sets out fundamental standards to help ensure compliance with legal requirements. Those collaborating with CABI in formal association are expected to follow comparable standards.

CABI Africa's regional office domiciled in Kenya has a headquarters agreement with the Government since 1993, and meets all country legal and ethical obligations. A headquarters agreement between CABI and the Government of Uganda is

nearing conclusion to have a physical presence in Uganda. The application for importation of the parasitoid into Kenya followed all national guidelines, and is in line with CABIs access and benefit-sharing policy. FAO's Code of Conduct for the Import and Release of Exotic Biological Control Agents outlined in ISPM No 3, will be strictly followed for the release of the parasitoid.

The project partners include national institutions with the mandate in agricultural research and biological control, and communities directly involved in the project, thus strengthening the partnerships that have been established through a previous Darwin project. At the community level, the project shall respect the rights, privacy, and safety of the intended beneficiaries, whether direct or indirect and seek their Prior Informed Consent (PIC) before the release of the parasitoid. Transparency and open communication in declaring conflicts of interest will be at the core; including in the reporting of research data collection methods; analysis and interpretation of data; and making research findings widely available.

Section 13 - FCDO Notifications

Q31. FCDO Notifications

Please state whether there are sensitivities that the Foreign Commonwealth and Development Office will need to be aware of should they want to publicise the project's success in the Darwin Initiative in any country.

No

Please indicate whether you have contacted FCDO Embassy or High Commission to discuss the project and attach details of any advice you have received from them.

⦿ Yes, advice attached

Please attach details of any advice you have received.

DIR28S11303-FCDO Contacted
25/01/2022
15:23:18
pdf 188.68 KB

Section 14 - Project Staff

Q32. Project staff

Please identify the core staff (identified in the budget), their role and what % of their time they will be working on the project.

Please provide 1-page CVs or job description, further information on who is considered core staff can be found in the Finance Guidance.

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?
Ivan Rwomushana	**Project Leader**	13	Checked
Selpha Opisa Miller	Biological control specialist (CABI)	15	Checked
Monica Kansiime	Socioeconomics coordinator (CABI)	9	Checked
Mary Bundi	M&E coordinator (CABI)	12	Checked

Do you require more fields?

⦿ Yes

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?
Bethel Terefe	Gender Coordinator (CABI)	9	Checked
Johnson Nyasani	Biological control specialist (KALRO)	10	Checked
Mellon Kabole	Plant Health Inspector (KEPHIS)	5	Checked
Wanja Kinuthia	Biodiversity monitoring (NMK)	10	Checked
Nankinga Caroline Mary K	Biological control specialist (NARO - MAAIF)	10	Checked
Peter B S Gama	Horticulture Specialist (University of Juba)	10	Checked
No Response	*No Response*	0	Unchecked
No Response	*No Response*	0	Unchecked

Please provide 1 page CVs (or job description if yet to be recruited) for the project staff listed above as a combined PDF.

Ensure the file is named clearly, consistent with the named individual and role above.

DIR28S11303-Curriculum Vitae
26/01/2022
09:49:33
pdf 273.35 KB

Have you attached all project staff CVs?

⦿ Yes

Section 15 - Project Partners

Q33. Project partners

Please list all the Project Partners (including the Lead Partner - i.e. the partner who will administer the grant and coordinate the delivery of the project), clearly setting out their roles and responsibilities in the project including the extent of their engagement so far and planned.

This section should demonstrate the capability and capacity of the Project Partners to successfully deliver the project. Please provide Letters of Support for all project partners or explain why this has not been included.

The partners listed here should correspond to the Delivery Chain Risk Map (within the Risk Register template) which you will be asked to submit if your project is recommended for funding.

Lead partner name:	CAB International

Website address:	www.cabi.org
Details (including roles and responsibilities and capacity to engage with the project):	CABI is a global, intergovernmental, not-for-profit organization whose aim is to improve people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and environment. The CABI team led by Dr. Ivan Rwomushana comprises expertise in insect biological control (Selpha Miller), social sciences (Kansiime Monica), monitoring and evaluation (Mary Bundi), gender (Bethel Terefe) and data management (Idah Mugambi) required for implementation of key activities. CABI has led the design and development of this project and will coordinate regional activities, specifically providing biological control expertise in mass rearing and release, studies on economic impacts and post release assessments, developing communication materials and creating awareness of communities about biological control, and conservation techniques, and ecological niche models for the parasitoid. CABI will also support all regional workshops, trainings and experiential visits. CABI has documented 20 mealybug pests in Kenya, with papaya mealybug ranked highly.
Allocated budget (proportion or value):	[redacted]
Represented on the Project Board	⦿ Yes
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:	Kenya Agriculture and Livestock Research Organization
Website address:	www.kalro.org
Details (including roles and responsibilities and capacity to engage with the project):	The mandate of Kenya Agriculture and Livestock Research Organization (KALRO) is to promote, streamline, coordinate and regulate all aspects of research in agricultural and livestock development and to promote the application of research findings and technologies in Kenya. It is the government agency responsible for crops and livestock research, agricultural technology and innovation generation, and developing mechanisms for their utilization. The facility for parasitoid mass rearing is hosted by KALRO Muguga. The KALRO team led by Dr. Johnson Nyasani will participate in the mass rearing of A. papayae, field releases in Kenya, post release assessments and facilitate capacity building for insitu community production. KALRO was part of the Darwin project that established that there are 20 mealybug pests in Kenya, and documented the most damaging species of which papaya mealybug ranked highly
Allocated budget:	[redacted]

Represented on the Project Board	⊙ Yes
Have you included a Letter of Support from this organisation?	⊙ Yes

2. Partner Name:	Kenya Plant Health Inspectorate Service
Website address:	www.kephis.org
Details (including roles and responsibilities and capacity to engage with the project):	Kenya Plant Health Inspectorate Service (KEPHIS) is Kenya's National Plant Protection Organization (NPPO) whose responsibility is to regulate all matters relating to plant protection, administer and enforce sanitary and phytosanitary measures. It further assures the quality of agricultural inputs and produce to prevent adverse impact on the economy, the environment and human health. KEPHIS further undertakes capacity building in line with its mandate to foster compliance to international SPS market requirements. KEPHIS is the Secretariat to the Kenya Standing Technical Committee on Imports and Exports (KSTCIE) that coordinates the approval of exotic parasitoid introductions and releases in the country. The KEPHIS led by Ms. Mellon Kabole will carry out post release assessments on behalf of KSTCIE/KEPHIS. KEPHIS was part of the Darwin project that established that there are 20 mealybug pests in Kenya, and documented the most damaging species of which papaya mealybug ranked highly
Allocated budget:	[redacted]
Represented on the Project Board	⊙ Yes
Have you included a Letter of Support from this organisation?	⊙ Yes

3. Partner Name:	National Museums of Kenya
Website address:	www.museums.or.ke
Details (including roles and responsibilities and capacity to engage with the project):	The National Museums of Kenya (NMK) is the national custodian of biodiversity and advises Kenyan government ministries and institutions dealing with forestry, wildlife, invasive species, fisheries, quarantine and mining, on biodiversity conservation, specimen identification, and biodiversity databasing, as well as species distribution and mapping, in support of fulfilling national and international agenda. NMK participated in the Darwin project “Biodiversity and Agriculture: addressing scale insect threats in Kenya” that established that there are 20 mealybug pests in Kenya, and documented the most damaging species of which papaya mealybug ranked highly. The NMK team led by Dr. Wanja Kinuthia will conduct pre- and post-parasitoid release to determine abundance and diversity of native invertebrates in papaya agro-ecosystems. NMK will particularly support the fragile state of South Sudan to initiate museum collections fr native biodiversity.
Allocated budget:	[redacted]

Represented on the Project Board	⊙ Yes
Have you included a Letter of Support from this organisation?	⊙ Yes

4. Partner Name:	National Agricultural Research Organization - Uganda
Website address:	www.naro.go.ug
Details (including roles and responsibilities and capacity to engage with the project):	The National Agricultural Research Organization (NARO) is an agency of the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) with the mandate to coordinate and oversee all aspects of public funded agricultural research in Uganda. NARO is mandated to undertake research in all aspects of agriculture including crops, livestock, fisheries, forestry, agro-machinery, natural resources and socio-economics. The NARO team led by Caroline Nankinga will coordinate the biological control releases in Uganda, conduct pre and post release studies, conduct socio-economic studies in Uganda and training of farmers in the country on biological control approaches.
Allocated budget:	[redacted]
Represented on the Project Board	⊙ Yes
Have you included a Letter of Support from this organisation?	⊙ Yes

5. Partner Name:	University of Juba - South Sudan
Website address:	www.uoj.edu.ss
Details (including roles and responsibilities and capacity to engage with the project):	University of Juba is a Public University located in Juba, South Sudan, founded in 1975 in response to the need for Higher Education in Southern areas of Sudan. The University has set its goal to conduct training, research and community outreach programmes for sustained peace, eradicating poverty, and enhancing socio-economic growth in South Sudan. UoJ will coordinate the biological control releases in South Sudan, conduct pre and post release studies, conduct socio-economic studies in South Sudan and training of farmers in the country on biological control approaches.

Allocated budget:	[redacted]
Represented on the Project Board	⦿ Yes
Have you included a Letter of Support from this organisation?	⦿ Yes

6. Partner Name:	*No Response*
Website address:	*No Response*
Details (including roles and responsibilities and capacity to engage with the project):	*No Response*
Allocated budget:	£0.00
Represented on the Project Board	◯ Yes ◯ No
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.

DIR28S11303-Support Letters
28/01/2022
14:40:41
pdf 1.73 MB

DIR28S11303-Response to review comments
27/01/2022
09:36:29
pdf 65.98 KB

Section 16 - Lead Partner Capability and Capacity

Q34. Lead Partner Capability and Capacity

Has your organisation been awarded a Darwin Initiative funding 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
DPLUS157	Robert Reeder	Managing the pathogens threatening St Helena's biodiversity and food security
DPLUS074	Norbert Maczey	Improving biosecurity and biological control capacity in the Falkland Islands
DPLUS033	Norbert Maczey	Enhancing biosecurity and biological control capacity in the Falkland Islands
22/001	Steve Edgington	Rescuing and restoring the native flora of Robinson Crusoe Island
16/008	David Minter	Conservation of Microfungi: a voice for unprotected and vulnerable organisms
15/004	Dave Moore	Conserving and Using Entomopathogenic Fungi and Nematodes within Chile

Have you provided the requested signed audited/independently examined accounts?

If yes, please upload these on the certification page. Note that this is not required from Government Agencies.

⦿ Yes

Section 17 - Certification

Q35. Certification

On behalf of the

Company

of

CAB International

I apply for a grant of

[redacted]

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 enclosed CVs for project key project personnel, letters of support, budget, logframe, safeguarding policy and project implementation timetable (uploaded at appropriate points in application)**
- **Our last two sets of signed audited/independently verified accounts and annual report are also enclosed.**

Checked

Name	Morris Akiri
Position in the organisation	Senior Regional Director - CABI Africa
Signature (please upload e-signature)	DIR28S11303-CABI certification 28/01/2022 13:47:12 pdf 273.17 KB
Date	28 January 2022

Please attach the requested signed audited/independently examined accounts.

CABI financial statement 2020 signed
26/01/2022
09:45:46
pdf 1.57 MB

CABI annual report and accounts 2019 signed
26/01/2022
09:45:37
pdf 2.21 MB

Please upload the Lead Partner's Safeguarding Policy as a PDF

Safeguarding Policy 2020
26/01/2022
09:46:26
pdf 712.75 KB

Section 18 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance, including the "Darwin Initiative Guidance**", "**Monitoring Evaluation and Learning Guidance**", "**Risk Guidance**" and "**Financial Guidance**".**	Checked
I have read, and can meet, the current Terms and Conditions **for this fund.**	Checked
I have provided actual start and end dates for the project.	Checked

I have provided my budget based on UK government financial years i.e. 1 April – 31 March and in GBP.	Checked
I have checked that our budget is complete, correctly adds up and I have included the correct final total at the start of the application.	Checked
The application been signed by a suitably authorised individual (clear electronic or scanned signatures are acceptable).	Checked
I have included a 1 page CV or job description for all the Project Staff identified at Question 32, including the Project Leader, or provided an explanation of why not.	Checked
I have included a letter of support from the Lead Partner and partner(s) identified at Question 33, or an explanation of why not.	Checked
I have included a cover letter from the Lead Partner, outlining how any feedback received at Stage 1 has been addressed where relevant.	Checked
I have included a copy of the Lead Partner's safeguarding policy, which covers the criteria listed in Question 29.	Checked
I have been in contact with the FCDO in the project country/ies and have included any evidence of this. If not, I have provided an explanation of why not.	Checked
I have included a signed copy of the last 2 annual report and accounts for the Lead Partner, or provided an explanation if not.	Checked
I have checked the Darwin website **immediately prior to submission to ensure there are no late updates.**	Checked
I have read and understood the Privacy Notice on the Darwin Initiative website**.**	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 the application form, including personal data, will be used by Defra as set out in the **Privacy Notice**, available from the Forms and Guidance Portal.

This **Privacy Notice must be provided to all individuals** whose personal data is supplied in the application form. Some information may be used when publicising the Darwin Initiative including project details (usually title, lead partner, project leader, location, and total grant value).