Applicant: **Deklerck, Victor**
Organisation: **Royal Botanic Gardens, Kew**
Funding Sought: **£98,240.00**

IWTEVR9S2\1005

Unlocking DNA barcoding to identify illegal timber

Species identification is essential to monitor and halt illegal timber trade (ITT). DNA-based identification (DNA barcoding) can be cheaper and more accurate than commonly used techniques (e.g. spectrometry, anatomy), but technical challenges have so far prevented its wide application to timber identification. Here, we will enable better ITT monitoring and regulation through DNA barcoding by providing research-based evidence of 1) the conditions for successful implementation of timber DNA barcoding, and 2) DNA barcoding methods applicable to key timber species.

PRIMARY APPLICANT DETAILS

Title   Dr
Name   Victor
Surname   Deklerck
Tel (Work)   ████████████████

Email (Work) ████████████████████████

Address   ██████
                  ██████
████████████████████████
                  ██████

IWTEVR9S2\1005

Unlocking DNA barcoding to identify illegal timber

Section 1 - Contact Details

PRIMARY APPLICANT DETAILS

Title	Dr
Name	Victor
Surname	Deklerck
Tel (Work)	████████
Email (Work)	████████
Address	████
	████
	██
	████████████
	████

GMS ORGANISATION

Type	Organisation
Name	Royal Botanic Gardens, Kew
Phone (Work)	████
Email (Work)	████
Address	████████
	██
	████
	██
	████████████
	████

Section 2 - Objectives, Species & Summary

Q3. Title:

Unlocking DNA barcoding to identify illegal timber

What was your Stage 1 reference number? e.g. IWTEVR9S1\1001

WTEVR9S1\1013

Q4. Which of the four key IWT Challenge Fund objectives will your project address?

Please tick all that apply. Note that projects supporting more than one will not achieve a higher score, and ticking objectives that your project does not address may negatively affect project scores.

- ☑ Ensuring effective legal frameworks and deterrents
- ☑ Strengthening law enforcement

Q5. Species project is focusing on

Please include both the common name and scientific name.

Entandrophragma angolense (Tiama, IUCN Red list: NT)	Entandrophragma candollei (Kosipo, IUCN Red list:VU)
Entandrophragma cylindricum (Sapelli, IUCN Red list: VU)	Entandrophragma utile (Sipo, IUCN Red list: VU)

Do you require more fields?

- ⦿ Yes

Lovoa trichilioides (Dibétou, IUCN Red list: LC)	Khaya anthotheca (Acajou d'Afrique, suggested to be put on CITES Appendix II at COP19, IUCN Red list: VU)
Khaya ivorensis (Acajou d'Afrique, suggested to be put on CITES Appendix II at COP19, IUCN Red list: VU)	Swietenia macrophylla, S. mahagoni and S. humilis (Mahogany, CITES Appendix II, IUCN Red list: VU, NT, EN)

Q6. 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 the website.

Please write this summary for a non-technical audience.

Species identification is essential to monitor and halt illegal timber trade (ITT). DNA-based identification (DNA barcoding) can be cheaper and more accurate than commonly used techniques (e.g. spectrometry, anatomy), but technical challenges have so far prevented its wide application to timber identification. Here, we will enable better ITT monitoring and regulation through DNA barcoding by providing research-based evidence of 1) the conditions for successful implementation of timber DNA barcoding, and 2) DNA barcoding methods applicable to key timber species.

Section 3 - Title, Dates & Budget Summary

Q7. Country(ies)

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

Country 1	Congo (DRC)	**Country 2**	Gabon
Country 3	*No Response*	**Country 4**	*No Response*

Do you require more fields?

○ Yes
○ No

Q8. Project dates

Start date:	**End date:**	**Duration (e.g. 2 years, 3 months):**
01 April 2023	31 March 2024	1 year

Q9. Budget summary

Year:	2023/2024	2024/25	Total Request
Amount:	▇▇▇▇	▇▇▇	▇▇▇▇

Q10. Proportion of IWT Challenge Fund budget expected to be expended in eligible countries: %   ▮

Q11a. Do you have matched funding arrangements?

⊙ Yes

What matched funding arrangements are proposed?

World Forest ID USA (USA, ▇▇▇▇) WFID expeditions and sample collections for the key timber species group we are focussing on.

RBGK (UK, ▇▇▇▇): Accessioning, curation, and custodial care of physical WFID samples at Kew. World-leading DNA analysis expertise (wider Tree of Life team).

Q11b. Total confirmed & unconfirmed matched funding (£)   ▇▇▇▇

Q11c. 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?

This is all confirmed.

Section 4 - Problem statement & Gap in existing approaches

Q12. Problem the project is trying to address

Please describe the problem your project is trying to address in terms of illegal wildlife trade and its relationship with poverty. What is the need, challenge or opportunity?

Please describe the level of threat to the species concerned.You should also explain which communities are affected by this issue, and how this aspect of the illegal trade in wildlife relates to poverty or efforts of people and/or states to reduce poverty.

Please cite the evidence you are using to support your assessment of the problem (references can be listed in your additional attached PDF document) and outline whether there have been any specific requests for this work.

The illegal timber trade (ITT) is the most profitable natural-resource crime, costing 50-152 billion USD/year [1,2]. Up to 90% of tropical timber may be illegally sourced [3]. ITT drives about half of forest loss, with devastating consequences including loss of biodiversity, natural capital, and long-term income for local communities and producer countries [4]. The illegal logging pressure on highly valued wood species is significant, leading to vulnerability, exhaustion or even near-extinction of the species [5]. The consequences of these illegal activities are not limited to ecological damage; legitimate concession holders, governments, and local communities are denied vital revenue and armed conflict and corruption are promoted [6-8].

A key obstacle to ITT regulation are look-alike species (with similar visual macroscopic and/or microscopic features) that are often intermixed in trade. To enforce timber regulations through local and international frameworks (UKTR, EUTR, Lacey Act, CITES), cost-effective high-throughput tools are required to identify traded timber species in producer and consumer countries.

Currently, timber species identification relies on wood anatomy and mass spectrometry, which require costly equipment and specialist expertise. A more accurate and cheaper method is species identification using DNA regions ("barcodes"). However, studies are lacking to identify the timber trade points (e.g. exploitation, distribution, consumer) and conditions at which DNA barcoding will be most useful. Moreover, the degraded nature of timber DNA raises technical challenges that remain to be fully addressed [9].

This project will provide the knowledge and scientific evidence required for better monitoring and regulation of ITT through the wide and novel implementation of timber DNA barcoding. We will focus on mahogany look-alike species, a group of protected species known to be difficult to monitor in trade (see [10]). This is now increasingly important as the African Khaya species have been accepted to be listed on CITES Appendix II at COP19. We will collaborate with researchers from the Democratic Republic of the Congo and Gabon, which are ITT and illegal deforestation hotspots [11], which leads to dramatic consequences for local communities [6-8]. Ultimately, this project will enhance in-country DNA analysis capacity, and strengthen law-enforcement tools, which will foster legal timber trade.

Q13. Gap in existing approaches

What gap does your project fill in existing approaches? Evidence **projects should describe how the improved evidence base will be used to design an intervention and the gap the intervention will fill.**

Timber species can be identified based on microscopic characters (anatomy), chemical profile (mass spectrometry) or genetic profile (DNA barcoding). Of these, DNA barcoding is the most performant to distinguish closely-related species [12,13]. Although this method has already been used for monitoring cycad or herbal medicine trades [14], its use for monitoring ITT is not widespread due to two main knowledge gaps. First, it remains unclear at what point(s) in the timber trade DNA barcoding would be most efficiently used, and what type of DNA barcoding approach would be most suitable. Second, DNA from timber products is generally degraded, which prevents the use of cheap "traditional" plant DNA barcoding. So far, the scarcity of genomic data from timber species and of systematic protocol optimisation experiments have prevented the design of DNA barcodes adapted to timber trade monitoring. By filling these knowledge gaps and overcoming these methodological limitations, we will build an evidence base that will support future large-scale implementation of the right DNA barcoding tools at the right points in the trade.

Section 5 - Objectives & Commitments

Q14. Which national and international objectives and commitments does this project contribute towards?

Consider national plans such as NBSAPs and commitments such as London Conference Declarations and the Kasane and Hanoi Statements. Please provide the number(s) of the relevant commitments and some brief information on how your project will contribute to them. There is no need to include the text from the relevant commitment.

The DRC and Gabon, have signed the London Conference Declaration and took part in the Kasane Conference. Developing ITT monitoring tools adapted to the species and economic realities of the DRC and Gabon is necessary to make their commitments on law enforcement and changes of practices, especially relating to the London Conference Declaration and Kasane statement, a reality.
This project aims at developing efficient methods to identify species in trade of high commercial interest and risk of over-exploitation, such as the CITES-listed Swietenia species, the soon to be CITES Appendix II (COP19) listed African Khaya species, and Entandrophragma species, cited as among the most over-exploited species in DRC's NBSAP. This will enable easier enforcement of the CITES treaty and other legal frameworks to develop a sustainable gestion of timber resources in the focus countries, which is a key objective of both DRC's and Gabon's NBSAPs (DRC's NBSAP Action 2.1.6; Gabon's Fifth report Objectives 4,11). Other key strategic objectives are the protection of biodiversity, benefit sharing, and the promotion of taxonomic research and knowledge acquisition (DRC's NBSAP Priority axes 5,6,9; Gabon Fifth Report Objectives 10, 18, 21,24). Training local scientists in plant DNA barcoding, will contribute towards these three objectives. DNA barcoding brings together taxonomy and genetics to tackle real-life problems, with applications beyond timber, for instance in the sustainable management and authentication of non-timber forest products, which are an important source of revenue in the focus countries (e.g. Section 1.1.2.6 of DRC's NBSAP; p. 14 of Gabon's Fifth Report).

Section 6 - Method, Change Expected, Gender & Post Project Sustainability

Q15. 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 reflected on and incorporated evidence and lessons learnt from past and present activities and projects in the design of this project.
- The specific approach you are using, supported by evidence that it will be effective and justifying why you expect it will be successful in this context.
- How you will undertake the work (activities, materials and methods).
- What will be the main activities and where will these take place?
- The specific approach you are using, supported by evidence that it will be effective and justifying why you expect it will be successful in this context.
- How you will manage the work (governance, roles and responsibilities, project management tools, risks etc.).

A challenge to implementing new tools for timber species identification is the diversity of practical, economic and logistic constraints along the timber supply chain. To avoid this pitfall, our first objective will be to better understand these constraints, and partners from the DRC and Gabon will be involved in all project phases.

In addition to this implementation challenge, previous attempts to apply DNA barcoding to timber identification have been hindered by 1) the lack of a reference DNA database against which to match the DNA of the samples of interest [15], 2) the difficulty to sequence traditional plant DNA barcodes from degraded timber DNA [16], and 3) the poor performance of these traditional barcodes at distinguishing some timber species from each other [17]. Our wide experience in sequencing degraded DNA [18,19] and bioinformatics expertise [20] will enable us to address these issues by better characterising the properties of timber DNA, optimizing methods for its extraction, building reference DNA datasets, and using these to identify barcodes that can be used on a wide range of DNA qualities and species. The key role played by the project's partners in previous projects involving timber trade monitoring and/or plant DNA barcoding exemplifies our capacity to succeed in overcoming these challenges [21-24].

OUTPUT 1: New data and knowledge providing a better understanding of the requirements for DNA barcoding implementation at key points of the timber trade supply chain
We will review the literature and organise remote and in-person (in Gabon and at the Royal Botanic Gardens, Kew (RBGK)) workshops and meetings between partners and stakeholders (NOG's, universities) to exchange knowledge and to identify requirements, incentives, challenges and potential pathways towards DNA barcoding implementation at various stages of the supply chain (suppliers, saw mills, companies, consumers).

OUTPUT 2: A better understanding of timber DNA properties and of DNA extraction techniques that can improve its quality
We will review existing protocols and design an experimental plan for timber heartwood DNA extraction protocol optimisation, keeping in mind logistic/cost limitations in focus countries. We will apply the experimental plan on the Mahogany focus species, and on a few other key timber species to confirm the protocol's broad applicability. Focus species are high quality timber species that are threatened (Swietenia species are CITES listed, and Khaya species that have been proposed to be CITES listed at COP19), and/or intermixed in trade, and/or exported from our focus countries, and available in the wood and herbarium collections of World Forest ID and RBGK.

OUTPUT 3: A better understanding of the DNA barcodes and methods that can be used to monitor the

trade of a key timber group

We will develop a comprehensive reference DNA dataset for the focus look-alike species and closely-related species by sequencing hundreds of nuclear, plastid, and mitochondrial loci (including traditional plant DNA barcodes) from expert- identified, georeferenced samples from the WFID and RBGK collections. This will be done by combining shallow Illumina sequencing and target capture sequencing of genetic regions that can distinguish between closely-related species and be sequenced from any angiosperm group [25-27]. We will use this new data and existing data [13,28] to identify candidate barcodes for the focus species by using existing tools [e.g. 29,30]. Some of these barcodes, and methods to sequence them under different logistic and economic constraints (Sanger sequencing of mini-barcodes vs Illumina sequencing), will then be tested on heartwood samples to identify the most appropriate approach depending on the timber supply chain level. The labwork will be done at RBGK, and the evidence generated will be used later to apply for funding to build DNA barcoding labs at UNIKIS and CENAREST. As part of these activities, partners from CENAREST and UNIKIS will be trained (at RBGK, in country and remotely) in DNA barcode design, sequencing and analysis.

Project Delivery and Risk Management

Project delivery and risk management will be led by Deklerck, with support from other partners. Tools such as the ASANA project manager software and a Slack Workspace will be used for budget management and task assignment and tracking. Monthly full team (all partners) meetings will take place via TEAMS, in addition to weekly meetings between Deklerck, Bellot and the RA, so that problems are quickly addressed and all partners can input throughout the project. Lab and bioinformatics training will be conducted by Bellot, labwork and data analysis will be conducted by the research assistant with input from Bellot, Ndiade Bourobou and Lisingo. Stakeholder consultation and literature review will be conducted by Deklerck, Bellot, Lisingo and Ndiade Bourobou.

Q16. 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.

Within the project, a knowledge and skill transfer will take place between researchers from CENAREST (Gabon), UNIKIS (DRC) and RBGK (UK).

The literature review and conversations with stakeholders (output 1) will provide an open knowledge base on the requirements to implement DNA barcoding within timber trade traceability with a specific focus on the needs in our focus countries. This will be used by organisations and individuals interested in developing timber trade monitoring actions (organisations having expressed such interest include UNODC) and foster closer collaboration between in-country stakeholders and research centers (CENAREST and UNIKIS).

The timber DNA extraction protocol, DNA barcodes and data analysis pipelines developed in this project will be available for implementation in the focus countries and beyond.

The DNA barcoding knowledge and lab and computing skills acquired by the partners based in the focus countries, as well as the tools and data generated in the project will allow them to lead future DNA barcoding projects and to train more people in their country.

We aim to continue this collaboration by applying for an IWT Extra grant in the next round to build local DNA barcoding labs and implement DNA-based timber trade monitoring in the focus countries.

In summary, this project will lead to (1) strengthening the stakeholder network within the focus countries, (2) development of DNA barcoding knowledge and DNA sequencing and analysis skills in the focus countries and (3) a long-term collaboration between RBGK and CENAREST and UNIKIS.

Q17. 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.

The income-generating activities of women in forest communities depend on the availability of non-timber forest products, which is directly impacted by illegal logging. By developing identification tools we can interrupt illegal chains and support the protection of natural resources. Legality frameworks can support women dependent on timber trade, forestry and forest-risk commodities [31]. Moreover, the involvement and fair treatment of women scientists that are stakeholders in the project is established in the organisation of the participating teams. The scientists who will receive training at RBGK are Dyana Ndiade Bourobou (female, CENAREST) and Janvier Lisingo (male, UNIKIS). The lead scientist who will deliver the DNA protocol training at RBG, Kew is Sidonie Bellot (female). We must note here that we are purposefully investing in early career researchers as one of our goals is to find future funding (for example IWT Extra grant) to support these researchers to become future leaders in their field.

Q18. Change expected

Detail the expected changes to both illegal wildlife trade and poverty reduction this work will deliver. You should identify what evidence will be gathered and how it might be used to inform future interventions. Please include who will benefit from these interventions, considering both people and species of focus a) in the short-term (i.e. during the life of the project) and b) in the long-term (after the project has ended) and the potential scalability of the approach.

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. Demand reduction projects should demonstrate their indirect links to poverty reduction.

Increased knowledge on current restrictions and conditions for successful DNA barcoding for timber species identification will provide a baseline for implementing timber DNA barcoding under various conditions; this will benefit scientists, policy makers, traders, and NGOs interested in applying this method to timber, in the short-term through knowledge exchange and networking, and in the long-term via (1) efficient implementation of timber DNA barcoding and (2) via the development of local capacity for DNA analysis to halt illegal timber exports from Gabon and DRC.

Establishing a baseline of the requirements needed to implement optimised protocols for heartwood DNA extraction will enable focus species DNA barcoding in the short-term, and provide an experimental framework to study other species, benefiting the genetics scientific community in the long-term. Reference data and DNA barcodes for the focus group will benefit scientists interested in the genetics of these species and allow implementation of DNA barcoding for timber identification for these species in the short- and long-term. The evidence and protocols gathered here will be scaled to additional species and geographic locations to widely implement DNA-based timber identification via four long-term outputs: 1) An effective and cost-efficient timber identification DNA toolkit using protocols, reference data and barcodes developed during this project, applicable to more species in the future. 2) Enhanced capacity for DNA analysis and bioinformatics in the focus countries. This project will train people to train others and develop a clear understanding of the resources required to form fully functional local labs, enabling in-country testing in future. 3) Evidence and demonstration of the potential to scale, enabling follow-on

IWT CF applications. 4) Increased protection of forest resources and associated livelihoods. The stakeholder network, DNA toolkit, and increased local lab capacity will empower forest resource suppliers, traders, and enforcement personnel to tackle ITT. This will lead to reduced illegal deforestation and conservation of forest resources and protect local communities from exploitation while helping them develop or maintain sustainable livelihoods, creating the conditions where community-based conservation can thrive.

Q19. Pathway to change

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

The illegal timber trade is rampant but cost-efficient and effective species identification techniques are lacking. By reviewing the state of the art, while identifying local constraints, we will identify actions needed to develop and implement efficient tools. By rigorously testing and optimising protocols, and by generating well-curated reference DNA datasets, we will enable the development of efficient DNA extraction and DNA barcoding for timber species. By including knowledge exchange and student co-supervision in our activities for each output, we will ensure that all partners acquire an autonomy sufficient to continue to develop DNA barcoding in their context beyond the end of the project. This Evidence project will be firmly embedded in Defra's strategy to restore and enhance the environment for next generations, especially by protecting the world's protected habitats and wildlife from illegal logging and exploitation, by providing genetics as a critical novel dimension to supply chain traceability. The development of this tool, in collaboration with local researchers from the focus countries, will lead to a more efficient and improved enforcement of legal timber frameworks. This project will also be developed into a full intervention as part of follow-on applications to the IWT Challenge Fund.

Q20. Post project sustainability

How will the project reach a sustainable point and continue to deliver benefits post-funding? How will the required knowledge and skills remain available to sustain the benefits? How will your approach, if proven, be scaled?

The development of reference data and the successful transfer of skills to our local researchers is the key aspect of this grant. This knowledge will be useful post-project as well, as we continue to build towards the implementation of illegal wildlife trade traceability tools. Together with our collaborators, we will apply for follow up grants (IWT Extra grant) and researchers from CENAREST, UNIKIS and RBGK will be actively engaged in any future DNA work on the World Forest ID sample collection. In addition, there will be future field sample expeditions in both Gabon and DRC under the World Forest ID umbrella to create local wood collections which can be used for DNA reference database creation, in addition to other timber forensic techniques. The development of this local capacity, both in terms of skills, knowledge and protocols will be used in the future timber identification cases.

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

No Response

Section 7 - 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.

⤓ BCF_Implementation_Timetable_Template_20
  22-23_FINAL
🗓 17/12/2022
🕐 08:11:14
📄 docx 35.36 KB

Section 8 - 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.

IWT Challenge Fund 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**).**

The M&E will be led by RBGK. This will be done collaboratively by weekly meetings between Deklerck, Bellot and the RA and monthly between all project partner to discuss whether we are on track to reach our deliverables, to compare against the logframe and to determine whether an adjustment is necessary. Meetings will be recorded (note-taking) and put on a shared folder so that all partners can go back to these reports.

Monitoring: Monitoring will be done by Deklerck, supported by the Research Assistant. At project kick-off, a logframe (Results Chain / Pathway to Change) will be developed based on the submitted timetable and our SMART indicators. Although a Theory of Change is not required for an evidence grant, we still think it is worthwhile to implement, keeping in mind future funding goals (IWT Extra) and extended impact of the proposed workplan.

Evaluation and Learning: The proposed monthly meetings between all project partners will be our key evaluation points. These meetings are meant to provide a systematic comparison between current progress and the logframe. The weekly meetings are meant for quick updates, next steps and potential trouble shooting. Based on the monthly meetings, we will adjust our methodology and approach as needed. Reflections on the project delivery, lessons learned and recommendations for next steps will be included in the end-of-project's report.

Total project budget for M&E in GBP (this may include Staff, Travel and Subsistence costs)	██████
Percentage of total project budget set aside for M&E (%)	█
Number of days planned for M&E	12

Section 9 - Indicators of success

Q23. Indicators of success

Please outline the Outcome and Outputs of the project and how will you show that they have been achieved by using SMART indicators and milestones.

See the Monitoring, Evaluation and Learning Guidance for advice on selecting SMART indicators and milestones.

Please note that the number of participants in training is not an output, please consider how to measure the success of the training rather than participation in training.

In the table below please outline your Outcome and between 1-4 Outputs. Each statement should have between 2-3 SMART indicators and end target (figure/state/quality) including how you would evidence achievement – i.e. "Means of Verification".

	SMART Indicator	Means of Verification

Outcome

A body of evidence and international
network that will support improved
monitoring and regulation of the timber trade through the use of DNA barcoding.

1. Q3 YR1 We have identified stakeholders, and requirements for implementation of DNA barcoding at key points of the timber trade.

2. Q2 YR1 We have created and made available a reference DNA dataset for ca. 20 timber species, including multiple samples per species and comprising hundreds of nuclear and plastid genes for each sample.

3. Q3 YR1 Using the reference dataset, we have identified DNA regions that can allow species identification in the group of look-alikes.

4. Q3 YR1 We have characterised the range of DNA qualities that can be obtained from timber products of the focus species, and protocol modifications that can improve DNA quality.

5. Q4 YR1 We have identified what DNA barcodes and DNA sequencing approaches could fit logistic and economic requirements for DNA barcoding implementation at key points of the timber trade.

6. Q4 YR1 At least one person from each of the focus countries has the labwork and bioinformatic skills required to perform DNA barcoding.

1. A publicly accessible report presenting our findings is available on the World Forest ID at RBGK webpage (Report 1).

2. The genetic data are available online (Treegenes and/or GenBank databases).

3 & 4. A publicly accessible report presenting the reference dataset, the DNA extraction protocols and DNA quality assessment results and the DNA regions (barcodes) is available on the World Forest ID at RBGK webpage (Report 2).

5. At least one article presenting all our results and conclusions drawn from combining both the supply chain analysis (Report 1) and DNA analysis (Report 2) lines of evidence has been drafted, ready to submit to a peer-reviewed journal and the draft is available on the World Forest ID at RBGK webpage (Article 1).

6. After their visit at Kew, the international collaborators are able to independently perform DNA extraction and sequencing. This will be showcased via a presentation as well (see output 3).

Output 1 New data and knowledge providing a better understanding of the requirements for DNA barcoding implementation at key points of the timber trade supply chain	1.Q2 YR1 Key supply chain stages, timber processing steps and stakeholders have been identified, including key locations in the supply chain for DNA barcoding implementation, and relevant questions to ask to stakeholders have been agreed upon. 2. Q3 YR1 At least one workshop conducted in Gabon (Q2) and 1 workshop conducted remotely (Q3) + individual meetings (Q2-Q3) with key stakeholders have been conducted in country or remotely 3. Q4 YR1 For these key steps in the chain, DNA barcoding pros and cons and conditions for implementation have been identified.	1. Flowchart presenting the results, list of relevant stakeholders to consult, and list of questions to ask the stakeholders are available on the World Forest ID at RBGK webpage as part of Report 1. 2. Minutes or anonymized summary of all conversations available on the World Forest ID at RBGK webpage 3. Written synthesis on DNA barcoding applicability and pathways towards implementation available on the World Forest ID at RBGK webpage as part of Report 1.
Output 2 A better understanding of timber DNA properties and of DNA extraction techniques that can improve its quality	1. Q1 YR1 Promising existing protocols for extracting DNA from timber have been identified and an experimental framework for protocol optimisation has been designed. 2. Q3 YR1 Protocols have been tested and optimised for the focus species and a few other timber species.	1. Written synthesis of promising protocols and experimental design available on the World Forest ID at RBGK webpage as part of Report 2. 2. Optimised DNA extraction protocol for the focus group + recommendations for timber in general are available on the World Forest ID at RBGK webpage as part of Report 2.

Output 3		
Output 3 A better understanding of the DNA barcodes and methods that can be used to monitor the trade of a key timber group	1. Q2 YR1 A reference DNA dataset has been generated for the focus group, including multiple samples per species and comprising hundreds of nuclear and plastid genes for each sample. 2. Q3-Q4 YR1 A set of candidate DNA barcodes adapted to different DNA analysis methods has been identified for the focus group. 3. Q4 YR1 Methods and barcodes have been classified depending on if they can or cannot be used at key points of the supply chain, due to logistic/economic requirements. 4. Ndiade Bourobou and Lisingo have successfully produced and analysed high-throughput DNA barcoding data and are able to transmit their knowledge to local students	1. The genetic data are available online (Treegenes and/or GenBank databases). 2 & 3. The barcodes and conclusions on barcodes and methods adapted to implementation at different points of the supply chain are presented in Report 2 available on the World Forest ID at RBGK webpage, and are prepared in the draft of in Article 1. 4. A one hour lecture will be given to local students at Kew by Ndiade Bourobou and Lisingo to showcase how to produce and analyse DNA barcoding data, the lessons learnt and how it can be implemented in the DRC and Gabon.
Output 4 *No Response*	*No Response*	*No Response*

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.

Each activity should start on a new line and be no more than approximately 25 words.

1.1: We will review the literature on timber trade and traceability and leverage our network of international partners.

1.2: We will hold meetings with timber suppliers and traders, law enforcers (e.g. BEIS-OPSS) and policy makers, focusing on DRC and Gabon.

1.3: A 3-day workshop will be organised in Gabon , including participants from all project partner organisations.

1.4: Report 1 will be written containing all results from Output 1.

2.1: We will review existing protocols, identify protocol steps to optimise (reagents utilised, amount of starting material, DNA purification strategy).

2.2: Improvement options will be tested keeping in mind the logistic/economic constraints in the focus countries (DRC and Gabon), following discussion among the partners.

2.3: We will apply the protocol optimisation plan to leaf (positive control), cambium, heartwood and

processed/old
heartwood samples of a species of each of the genera.
2.4: At least 3 replicates per treatment per sample type per species will be performed for up to ca. 500 DNA extractions.
2.5: Depending on resources and time, the optimised protocol may then be tested on representative timber species of a few additional key genera such as Dalbergia and Pterocarpus.
2.6: Labwork will be performed by RBGK Research Assistant.
3.1: To generate the reference DNA dataset, we will sample >3 individuals from ca. 22 species (focus group + congeneric species)
3.2: Samples will be selected, prioritizing well identified, vouchered and georeferenced specimens. Air or silica-dried leaf samples will be prioritized and completed by herbarium samples.
3.3: Some wood samples from WFID collection and xylaria will be included to test the use of wood samples for making DNA reference datasets.
3.4: Samples will be submitted to DNA extraction and DNA library preparation.
3.5: Part of the library will be submitted to shotgun Illumina sequencing to recover ribosomal DNA, plastid and mitochondrial genes.
3.6: Rest will be submitted to target sequence capture with Angiosperms-353 probe kit + Illumina sequencing, allowing sequencing the same 353 nuclear regions in all samples.
3.7: To identify candidate DNA barcodes adapted to different DNA analysis methods, data from 3.5/3.6 will be analysed together with published data for the focus species.
3.8: Amplification and sequencing of some of these candidate barcodes will be tested on heartwood DNA samples of the focus species.
3.9: Different methods will be tested to establish what combination of barcodes-method could be applied under
logistic/economic constraints identified for different supply chain stages and countries.
3.10: Labwork will be performed by RBGK Research Assistant in collaboration with local researchers from DRC and Gabon who will be invited at Kew.
3.11: The local researchers will be trained in DNA barcode design, sequencing and analysis.
3.12: The local researchers will transmit their new knowledge to local students through at least 1 seminar.
3.13: Report 2 will be written, containing summary and data from all activities of Outputs 2 and 3.
3.14: Article 1 will be drafted
3.15: All genetic data will be submitted to GenBank and/or Treegenes

Important Assumptions

Please describe up to 6 key assumptions that, if held true, will enable you to deliver you Outputs and Outcome.

We are able to identify key implementation challenges and incentives. Mitigation: we are well implanted in the timber trade sector.

The DNA quality obtained from wood samples will enable the use of cheap DNA barcoding methods. Mitigation: multiple "mini-barcodes" can be used in combination [32], and some actors of the supply chain could accommodate expensive approaches working on degraded DNA.

The DNA regions targeted to build the reference dataset vary sufficiently to enable the identification of DNA barcodes characteristic of each species Mitigation: these regions have been shown to vary between closely-related species in many plant families [16,17,18].

Section 10 - 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.

Budget spreadsheet

Note that there are different templates for projects requesting under £100,000 and over £100,000 but all Evidence projects should use the under £100,000 form. Please refer to the Finance Guidance for more information.

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 IWT Challenge Fund cannot agree any increase in grants once awarded.

Please upload evidence of the Lead Partner's financial capacity at the certification page at the end of the application form.

- ⬇ BCF_Budget_under__100K_MASTER_Apr22
- 🗓 17/12/2022
- 🕐 08:34:24
- 📄 xlsx 39.52 KB

Q25. Funding

Q25a. Is this a new initiative or does it build on existing work (delivered by anyone and funded through any source)?

⊙ New Initiative

Please provide details:

The proposed grant is a new initiative, but it builds upon the existing efforts of World Forest ID and RBGK to create the world's largest georeferenced timber collection to provide reference databases which allow to identify illegal timber. The project also builds upon existing knowledge in terms of DNA analysis and timber trade monitoring at CENAREST, UNIKIS and RBGK.

Q25b. 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.

The presented topic is of high priority for CENAREST, UNIKIS, RBGK and World Forest ID, as one of our main goals is to strengthen local capacity in timber forensic identification techniques. Although there are currently no plans for similar work, we will pursue the development of this topic in future grants if this

application proves to be unsuccessful.

Q26. Capital items

If you plan to purchase capital items with IWTCF 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.

The presented topic is of high priority for CENAREST, UNIKIS, RBGK and World Forest ID, as one of our main goals is to strengthen local capacity in timber forensic identification techniques. Although there are currently no plans for similar work, we will pursue the development of this topic in future grants if this application proves to be unsuccessful.

Q27. 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.

The only capital items included in this project proposal are the research grade laptops for the research assistant (RA), who will be employed under this grant, and for the local researchers in Gabon and DRC. The RA laptop will be used by other future staff at RBGK when this project ends. In case our planned follow-up application (IWT Extra grant) proves successful, this laptop will be incorporated in that project as well. The laptops for our local collaborators will continued to be used in their laboratories after this grant, and can be incorporated in follow-up applications as well.

Section 11 - Risk Management

Q28. 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 Risk, and one Delivery Chain Risk.

Projects should also draft their initial risk register, using the Risk Assessment template**, 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	Residual Risk

Fiduciary The project budget could be misappropriated.	Minor	Unlikely	Minor	RBGK has a transparent acquisition pipeline which allows accounting for all expenditure. MOU's will also be outlined between partners which will outline the collaboration and work agreement.	Minor
Safeguarding Participants may be alienated or pressured into stressful project delivery situations.	Minor	Rare	Minor	We will follow/offer all collaborators and participants access to the reporting procedure in Kew's mandatory safeguarding training.a	Minor
Delivery Chain DNA extracted from timber remains of low quality even after DNA extraction protocol optimisation	Moderate	Possible	Moderate	DNA extraction protocols test results will still be a valuable source of information to the community and the inclusion of modern DNA sequencing techniques that can accommodate very low DNA quality significantly reduces this risk	Moderate
Risk 4 Potential UK visa issues for our collaborators in Gabon and DRC. Both in obtaining them and duration of procedure to obtain them.	Moderate	Possible	Moderate	RBGK has a long standing expertise of inviting international travellers and will make sure to offer sponsorship and invitation letters. Visits timing at Kew can be shifted if need be. We will start the visa application process as soon as we know whether we have the grant.	Moderate

Risk 5 Access to stable internet can prevent optimal remote meetings/workshops and hinder DNA processing in country	Moderate	Unlikely	Minor	We will work together with our partners to set up the most robust system for remote meetings. We will also contact the IT department at Kew for their help in creating a stable connection if problems arise.	Minor
Risk 6 Danger of not finding the right stakeholders which leads to misidentifying requirements for useful and efficient use of DNA barcoding	Minor	Unlikely	Minor	We will work together with our partners to identify key stakeholders. In addition, all partners have existing relationships which can be tapped into with other organisations involved in this sector in both Gabon and DRC.	Minor

Section 12 - Safeguarding and Ethics

Q29. Safeguarding

Projects funded through the IWT Challenge Fund 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 for all people impacted by the project.

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

We have a safeguarding policy, which includes a statement of our commitment to safeguarding and a zero tolerance statement on human rights abuses, bullying, harassment and sexual exploitation.	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 all 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 all partners apply the same standards as the Lead Partner.

If your project involves data collection and/or analysis which identifies individuals (e.g. biometric data, intelligence data), please explain the measures which are in place and/or will be taken to ensure the proper control and use of the data. Please explain the experience of the organisations involved in managing this information in your project.

RBGK's safeguarding code of conduct will be shared at project onset with all partners and will be followed by all partners. This will be ensured via completion of Kew's international safeguarding risk assessment form. Safeguarding issue reporting will follow the protocol outlined in Kew's code of conduct. The World Forest ID reference database, which logs all metadata related to the timber samples, has been established keeping into account GDPR regulation and safeguarding protocols.

Q30. Ethics

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

We will ensure that the project meets all legal and ethical obligations of all countries involved in the project. As our project deals with genetic resources, we can rely on Kew's long-standing expertise in handling Nagoya, CBD and ABS requirements. We will include our partners in DRC and Gabon in these assessments. We will encourage participation from the DRC and Gabon and the communities affected by the illegal wildlife trade to incorporate their perspectives and knowledge into this project. Within the workshop meeting in Gabon, we will ensure active participant engagement from different stakeholder groups and we will develop a summary guide after the meeting which will be shared with each participant. At the project kick-off, we will explain how the project will deal with the collection, storage and use of personal data. We will ensure to respect the rights, privacy and safety of the people who are impacted (in-)directly by the project activities.

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 IWT Challenge Fund 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

Please attach evidence of request or advice if received.

  ⛬ ContactEmbassyGabon
  📅 17/12/2022
  🕐 08:40:57
  📄 docx 123.65 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?
Victor Deklerck	**Project Leader**	5	Checked
Sidonie Bellot	DNA barcoding methodology development and training (lab and bioinformatics), DNA data analysis	5	Checked
Laszlo Csiba	DNA extraction methods research and lab training	5	Checked
Research Assistant (to be recruited)	Literature review, DNA extraction and sequencing in the lab and DNA data analysis	100	Unchecked

Do you require more fields?

⊙ Yes

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?

Dyana Ndiade Bourobou	Dyana Ndiade Bourobou DNA barcodes design and analysis and local capacity development	10	Checked
Janvier Lisingo	Dyana Ndiade Bourobou DNA barcodes design and analysis and local capacity development	10	Checked
No Response	*No Response*	0	Unchecked
No Response	*No Response*	0	Unchecked
No Response	*No Response*	0	Unchecked
No Response	*No Response*	0	Unchecked
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.

⤓ Combined_CV
🗓 17/12/2022
🕐 09:23:08
📄 pdf 625.11 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), 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:	Royal Botanic Gardens, Kew

Website address:	https://www.kew.org/
Why is this organisation the Lead Partner, and what value to they bring to the project? (including roles, responsibilities and capabilities and capacity):	RBGK has a long-standing history in natural collection management and the development of methods to extract and analyse the DNA from these collections to tackle fundamental and applied questions in the fields of plant taxonomy, evolution and identification. It is also the main curation center for the World Forest ID collection. The team at RBGK will lead on the DNA barcoding method development and DNA reference database creation in collaboration with researchers from DRC and Gabon. RBGK also provides supporting world-leading DNA expertise via the Tree of Life Team.
International/ In-country Partner	In-country
Allocated budget (proportion or value):	▮▮▮
Representation on the Project Board (or other management structure):	⊙ 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:	National Center for Scientific and Technology Research (CENAREST), Gabon
Website address:	http://www.cenarest-gabon.org/?p=accueil

What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):	(Max 200 words) Dr. Ndiade Bourobou obtained her PhD at the University of Montpellier (France) and she leads the General Research Programs Management at CENAREST. The CENAREST is a Gabonese public institution for scientific research within the Ministry of Higher Education and Scientific Research. It is led by Commissioner General, Prof. Alfred Ngomanda. CENAREST is the technical body for the coordination and implementation of the national research policy, and on the other hand, scientific manager for the research issues of the Emerging Gabon Strategic Plan (PSGE), scientific support of reference for the preservation of the environment and the Congo Basin Forest. Dr. Ndiade Bourobou is also an expert on genetic diversity on African tree species. CENAREST will co-develop the DNA toolkit methodology and co-develop the flowchart on local constraints for DNA barcoding in Gabon supply chains and how to implement the protocol. Dr. Ndiade Bourobou will visit RBGK for a couple of weeks to develop the protocols together with RBGK and UNIKIS researchers.
International/ In-country Partner	International
Allocated budget (proportion or value):	▮
Representation on the Project Board (or other management structure):	⊙ Yes
Have you included a Letter of Support from this organisation?	⊙ Yes

2. Partner Name:	University of Kisangani (UNIKIS), Democratic Republic of the Congo
Website address:	http://www.unikis.ac.cd/
What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):	UNIKIS is one of the 5 best universities in the DRC, teaching more than 6000 students. The main scientific collaborator from UNIKIS is Dr. Lisongo, an expert in DNA analysis. Dr. Lisongo obtained his PhD at UNIKIS and continued to develop his DNA expertise with a postdoctoral position at the Free University of Brussels (Belgium). UNIKIS will co-develop the DNA toolkit methodology and will co-develop the flowchart on local constraints for DNA barcoding in DRC supply chains and how to implement the protocol. Dr. Lisingo will visit RBGK for a couple of weeks to develop the protocols together with RBGK and CENAREST researchers.
International/ In-country Partner	International

Allocated budget (proportion or value):	▮▮▮
Representation on the Project Board (or other management structure):	⦿ Yes
Have you included a Letter of Support from this organisation?	⦿ Yes

3. Partner Name:	World Forest ID
Website address:	https://worldforestid.org/
What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):	Since 2019, World Forest ID has trained collectors on five continents to sample timber to build reference collections. Within Africa, World Forest ID has collected over 750 timber samples, including 410 samples in Gabon and 130 samples in the DRC). World Forest ID will provide access to the sample collections and will provide support and in-kind contributions for additional field sampling missions in both DRC and Gabon. In addition, World Forest ID has an existing relationship with CENAREST for timber sampling (Gabon). World Forest ID also has a African Collection Lead, Nathalie Bouville (Central African Republic), who will provide support during the project.
International/ In-country Partner	International
Allocated budget (proportion or value):	£0.00
Representation on the Project Board (or other management structure):	⦿ Yes
Have you included a Letter of Support from this organisation?	⦿ Yes

4. Partner Name:	*No Response*

Website address:	*No Response*
What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):	*No Response*
International/ In-country Partner	*No Response*
Allocated budget (proportion or value):	£0.00
Representation on the Project Board (or other management structure):	○ Yes ○ No
Have you included a Letter of Support from this organisation?	○ Yes ○ No

5. Partner Name: *No Response*

Website address:	*No Response*
What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):	*No Response*
International/ In-country Partner	*No Response*
Allocated budget (proportion or value):	£0.00

Representation on the Project Board (or other management structure):	○ Yes ○ No
Have you included a Letter of Support from this organisation?	○ Yes ○ No

6. Partner Name:	*No Response*
Website address:	*No Response*
What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):	*No Response*
International/ In-country Partner	*No Response*
Allocated budget (proportion or value):	£0.00
Representation on the Project Board (or other management structure):	○ 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.

Section 16 - Lead Partner Capability and Capacity

Q34. Lead Partner Capability and Capacity

Has your organisation been awarded IWT Challenge Fund, Darwin Initiative, or Darwin Plus 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
IWT114	Carly Cowell	Harnessing technology to end the illegal trade in succulent plants
DARCC014	Aishay Faruk	Enhancing the capacity and capability of orchid conservation in Armenia
DPLUS144	Rosemary Newton	Protecting South Georgia's terrestrial communities from climate change-invasion synergies
REF28-012	Maria Vorontsova	Native grass forage management to feed people and protect forests
No Response	*No Response*	*No Response*
No Response	*No Response*	*No Response*

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

Certification

On behalf of the

Trustees

of

Royal Botanic Gardens, Kew

I apply for a grant of

███████████

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 key project personnel, a cover letter, letters of support, a budget, logframe, safeguarding policy and project implementation timetable
- Evidence of our financial capacity (see Finance Guidance) is also enclosed.

  Checked

Name	Victor Deklerck
Position in the organisation	Research Leader
Signature (please upload e-signature)	⮋ <u>Signature</u> 🗓 17/12/2022 🕙 09:27:21 📄 jpg 9.89 KB
Date	17 December 2022

Please attach the requested signed audited/independently examined accounts.

⮋ <u>Audit - RBG Kew - Annual Report and Accounts 2021-22</u>
🗓 17/12/2022
🕙 09:25:53
📄 pdf 761.3 KB

⮋ <u>Audit - RBG Kew - Annual Report 2020-2021 Web accessible - final</u>
🗓 17/12/2022
🕙 09:25:53
📄 pdf 822.21 KB

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

⮋ <u>Safeguarding-Policy-January-2022</u>
🗓 17/12/2022
🕙 09:25:58
📄 pdf 389.28 KB

Section 18 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance, including the "IWT Challenge Fund 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 attached my completed logframe **as a PDF using the template provided**	Checked
(If copying and pasting into Flexi-Grant) I have checked that all my responses have been successfully copied into the online application form.	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 other evidence of financial capacity as set out in the Financial Guidance, or provided an explanation if not.**	Checked
I have checked the IWT Challenge Fund website **immediately prior to submission to ensure there are no late updates.**	Checked
I have read and understood the Privacy Notice on the IWT Challenge Fund 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 IWT Challenge Fund and our sister grant scheme, the Darwin Initiative. 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).

Project Title:

Provide a **Project Implementation Timetable** that shows the key milestones in project activities. Complete the following table as appropriate to describe the intended workplan for your project. Quarters are based on UK FYs (**1 April – 31 March** - Q1 therefore starts April 2023).

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 shade only the quarters in which an activity will be carried out. The activity numbers should correspond to the activities in your logical framework (logframe). The workplan can span multiple pages if necessary.

This template covers multiple Biodiversity Challenge Funds schemes, so ensure you check the eligible dates/project length for the scheme you are applying to and feel free to delete later years if not applicable for your project.

	Activity	No. of months	Year 1 (23/24)			
			Q1	Q2	Q3	Q4
Output 1	**New data and knowledge proving a better understanding of the requirements for DNA barcoding implementation at key points of the timber trade supply chain**					
1.1	Literature review on timber trade traceability + identification of supply chain steps most relevant for DNA barcoding applications + stakeholders to consult + planning for stakeholder consultation	4	██	██		
1.2	Conversations (remote or in person when possible) about DNA barcoding pros and cons and conditions for field implementation with stakeholders (timber suppliers and traders, law enforcers e.g. BEIS-OPSS, and policy makers, focusing on DRC and Gabon)	4		██	██	
1.3(a)	3- day workshop between partners and key stakeholders to exchange knowledge and to identify requirements, incentives, challenges and potential pathways towards DNA barcoding implementation at various stages of the supply chain	<1		██		
1.3(b)	Writing a synthesis on DNA barcoding pros and cons and conditions for field implementation at relevant steps of the supply chain	2			██	██
Output 2	**A better understanding of timber DNA properties and of DNA extraction techniques that can improve its quality**					

Project Title:

	Activity	No. of months	Year 1 (23/24)			
			Q1	Q2	Q3	Q4
2.1	Review existing protocols for timber heartwood extraction protocol optimisation	2	■			
2.1	Design experimental plan for timber heartwood protocol optimisation	<1	■			
2.2	Application of experimental plan on the look-alike Mahogany focus species, and on a small set of other key timber species. Plan will be tested on leaf (positive control), cambium, heartwood and processed/old heartwood samples.	4		■	■	
Output 3	**A better understanding of the DNA barcodes and methods that can be used to monitor the trade of a key timber group**					
3.1	Sample selection for the development of a comprehensive reference DNA dataset for the focus look-alike species and closely related species using mostly air/silica-dried leaves (i.e. no need for optimised DNA extraction protocol at this stage)	1	■			
3.1	DNA extraction and generation of genomic data for the reference DNA dataset	4	■	■		
3.1	Visit from partners from DRC and Gabon to Kew to take part in lab and data analysis work	1			■	
3.2	Identify candidate barcodes adapted to different DNA analysis methods for the focus species by analysing reference data together with existing data	3		■	■	
3.3	Testing of barcodes and sequencing methods on heartwood of the focus species under different logistic and economic constraints	3			■	■
3.3	Synthesize results from all activities in report on barcodes and methods adapted to implementation at different points of the supply chain and plan future work	2				■

Biodiversity Challenge Funds Implementation Timetable Template