



## **Grant application:** Conservation of threatened tree species in three Tropical Important Plant Areas (TIPAs) of Guinea

### **Applicant information**

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<b>Mission of the organization:</b> Royal Botanic Gardens, Kew (RBGK) is a UNESCO World Heritage Site, founded in 1840, renowned as an international centre of excellence for plant science tackling urgent environmental challenges, with unrivalled collections (c. 8.5 million items) and staff expertise (c. 800 staff, > 500 volunteers). Its mission is to be a global resource for plant knowledge, and the world's leading botanic garden. In 2015, it published a Science Strategy with three main strategic priorities: (1) To document and conduct research into global plant and fungal diversity and its uses for humanity; (2) To curate and provide data-rich evidence from Kew's unrivalled collections as a global asset for scientific research; and (3) To disseminate our scientific knowledge of plants and fungi, maximising its impact in science, education, conservation policy and management. RBGK has partnerships in c. 100 countries. The gardens receive >2 million visitors annually and serve as a platform to communicate RBGK's Science and promote awareness of conservation, plant diversity and other major issues. RBGK contributes to the UN Sustainable Development Goals (SDG) and the implementation of the Global Strategy for Plant Conservation (GSPC). Collection data of living plants are available via BGCI's PlantSearch. RBGK is an accredited member of ArbNet.

### **Executive Summary**

Endemic and near-endemic tree species and the habitats in which they occur are heavily impacted by human activities in Guinea and need urgent conservation attention to prevent globally unique species to be lost forever. Building on the outcomes of recent projects which: (1) identified 22 Tropical Important Plant Areas (TIPAs) and 9 threatened habitat types in Guinea; (2) produced IUCN Red List assessments for many of Guinea's 273 indigenous threatened plant species; and (3) produced Conservation Action Plans (CAPs) for 20 species, we now aim to improve the conservation status of 13 target tree species by establishing tree nurseries to support reforestation. We also aim to reduce threats by fire to the target tree species by 50% in the three target TIPAs. Equally, we aim to achieve policy change on *in situ* conservation through the creation and acceptance of a National Action Plan which will provide official protected status for 27 globally threatened tree species in Guinea, and which will include them in forest reforestation programmes. Lastly, we aim to create public awareness, especially amongst schoolchildren, to the fact that: (1) Guinean rare and endemic tree species exist, and (2) are highly threatened by human activities and should be protected.

## Long-term vision

Our long-term vision is to halt biodiversity loss in threatened habitats and reduce the threat of extinction of unique tree species in Guinea through a programme combining on-the-ground conservation actions, capacity building, policy change and opportunities to improve livelihoods through cultivation of native tree species in local communities.

## Duration

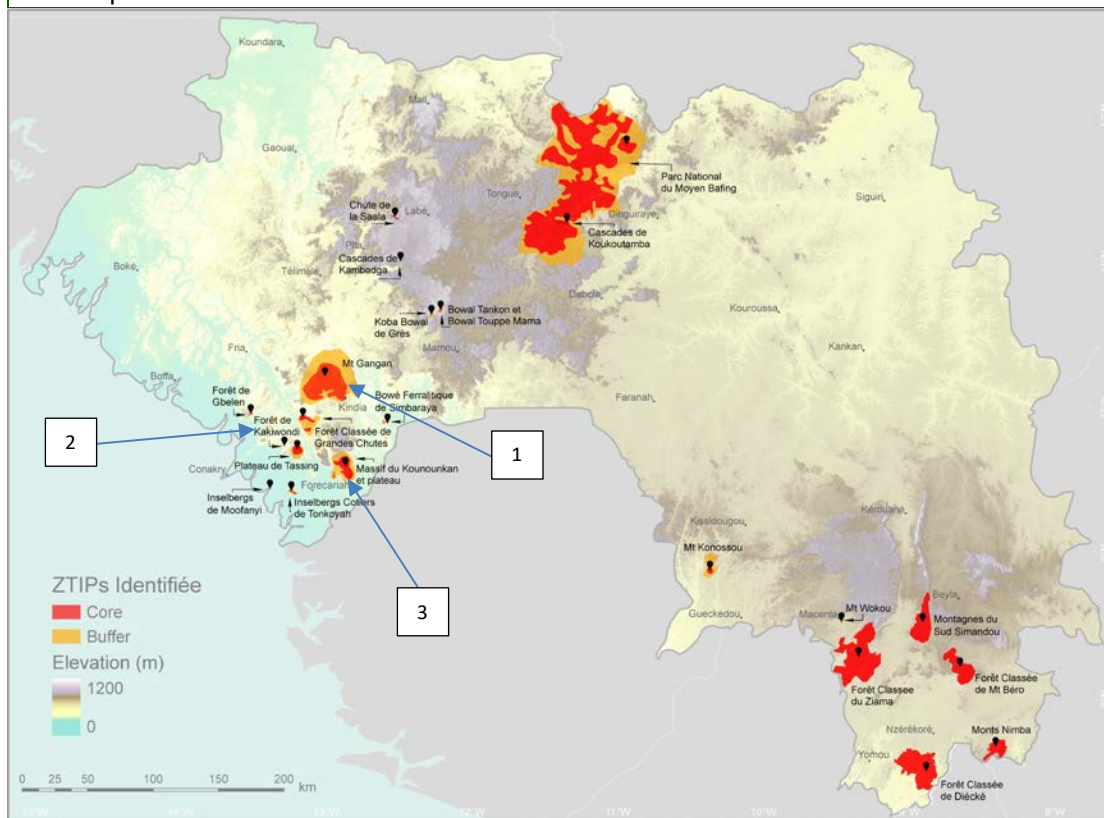
**Project duration:** 36 months

**Project start date:** 01/10/2020

**Project end date:** 30/09/2023

## Project location

The project will take place in the Republic of Guinea, West Africa. Three of the recently identified Tropical Important Plant Areas (TIPAs) in Guinea's Guinée Maritime region: (1) Mt Gangan TIPA, and (2) Kakiwondi TIPA, and (3) Kounounkan TIPA are being targeted with this project. See map below for locations.



### Threatened Species/Habitat Type Targeted

The target species are listed below with their IUCN Red List status and threatened habitat type:

Tree species	IUCN RL status	Threatened habitat	TIPA, Region
<i>Apodiscus chevalieri</i> Hutch.	EN	Sandstone cliffs & Lowland evergreen forest	Mt Gangan, Guinée Maritime
<i>Cola angustifolia</i> K.Schum.	EN	Submontane forest	Kounounkan, Guinée Maritime
<i>Cola lorougnonis</i> Aké Assi	CR	Submontane forest	Kounounkan, Guinée Maritime
<i>Calophyllum africanum</i> Cheek & Q.Luke	CR	Submontane forest (in Mali lowland)	Guinée Maritime
<i>Dactyladenia smeathmannii</i> (Baill.) Prance & White	EN	Lowland evergreen forest	Guinée Maritime
<b><i>Diospyros feliciana</i> Letouzey &amp; F.White</b>	EN	<b>Lowland evergreen forest</b>	<b>Mt Gangan, Kakiwondi, Kounounkan, Guinée Maritime</b>
<i>Fleurydora felicis</i> A.Chev.	EN	Sandstone cliffs	Mt Gangan, Guinée Maritime
<i>Gilbertiodendron tonkolili</i> Burgt & Estrella	EN	Lowland evergreen forest	Guinée Maritime
<b><i>Keetia susu</i> Cheek</b>	EN	<b>Lowland evergreen forest</b>	<b>Mt Gangan, Kakiwondi, Kounounkan, Guinée Maritime</b>
<i>Napoleonaea alata</i> Jongkind	EN	Lowland evergreen forest	Mt Gangan, Guinée Maritime
<b><i>Talbotiella cheekii</i> Burgt</b>	EN	<b>Lowland evergreen forest</b>	<b>Kakiwondi, Guinée Maritime</b>
<b><i>Tarenna hutchinsonii</i> Bremek.</b>	CR	<b>Lowland evergreen forest</b>	<b>Kakiwondi, Guinée Maritime</b>
<i>Ternstroemia guineensis</i> Cheek ined.	CR	Submontane forest	Kounounkan, Guinée Maritime

Targeted threatened habitats: Lowland evergreen forest, Submontane forest and Sandstone cliffs. All recognised as threatened habitats in Guinea (Couch et al., 2019). The species listed in bold have a Species Conservation Action Plan (<http://www.herbiiergee.org/documents-du-projet-bid.html>).

## Current status of project

This project builds on the outcomes of the recently completed Darwin Initiative funded project (funded by the UK Government, Department for Environment, Food & Rural Affairs - DEFRA) called "Important Plant Areas of Guinea-Conakry" and a BID (Biodiversity Information for Development) funded project (funded by the European Union and led by the Global Biodiversity Information Facility - GBIF) entitled "Towards a Red Data Book for Guinea". Data gathered on threatened plant species as part of the BID project were used to produce IUCN Red List assessments. These assessments and fieldwork undertaken as part of the Darwin project and previous expeditions since 2005, were utilised to identify Tropical Important Plant Areas (TIPAs) based on the presence and concentrations of threatened plant species, high plant diversity and threatened habitat in Guinea. As part of the BID project Conservation Action Plans (CAPs) were written for 20 species. The tree species in bold above have species conservation action plans written and approved by the Working Group on TIPAs and CAPs.

This project will expand on and implement these action plans, work with communities in the buffer zones of Important Plant Areas where they occur, to protect them *in situ* and set up village nurseries to collect seed and grow them for replanting into the protected areas.

The project lead Dr Martin Cheek is co-chair of the newly established West Africa Plant Red List Authority recently approved by the IUCN Species Survival Commission. In this capacity, he is in close contact with experts in plant conservation working on West African plants and with Dr Malin Rivers at BGCI / Global Trees Specialist Group to focus conservation efforts where they are most needed.

## Project Budget (in preferred currency)

**Funding request: £272446**

**Total budget: £576915**

**Confirmed matching funds: £153174**

**In-kind contribution: £151295**

### Information on matching funds:

- During the proposed project: RBGK (3 months of salary in-country officer), Ellis Goodman Family Foundation (3 months of salary in-country officer), HNG-UGANC (vehicle maintenance), Rio Tinto (nursery materials).
- Results generated during previous Darwin Initiative and GBIF-BID funded projects have provided baseline information. The Ellis Goodman Family Foundation project will run alongside it in Year 1 focussing on socio-economic plant and fungi species in Guinea paying for PhD students who will support the proposed project during fieldwork, community engagement and training.

### Information on in kind contribution:

- RBGK contributes: 10% of salary of Martin Cheek, 10% of salary of Isabel Larridon, 20% of salary of Xander van der Burgt, and RBGK waives £151295 of its usual overheads on these salaries and the salary of the in-country officer.
- UGANC-HNG contributes: use of 4x4 for fieldwork, office space, nursery space and initial equipment facilities, staff time (of those outside project staff).
- MEEF contribution of staff time (of those outside project staff) for site visits and meetings.
- AGEDD contribution of staff time (of those outside project staff) for site visits and meetings.

## Key Project Staff

Dr Martin Cheek, Head of Africa and Madagascar Team, RBGK, 59y, project lead, general coordination of the project activities with all cooperation partners, project design, contact, fieldwork, project progress reports, co-supervisor of PhD students, 10%.

Prof Dr Isabel Larridon, B.A. Krukoff Curator of African Botany, RBGK, 35y, project support, fieldwork, supervisor of PhD students, training, 10%.

Dr Xander van der Burgt, Curator-Botanist and Field Officer, RBGK, 61y, project support, fieldwork, seed collection, training, 20%.

Charlotte Couch, Technical Advisor to the National Herbarium of Guinea, 42y, coordination of the project activities with Guinea partners incl. government, fieldwork, nursery advisor, 100%.

Dr Sékou Magassouba, General Director of the National Herbarium of Guinea, 53y, in-country partner, liaison, reporting and staff management, 20%.

Saïdou Doumbouya, Deputy Director of the Centre d'Observation de Surveillance et D'Informations Environnementales (COSIE), and GBIF focal point (Ministère de l'Environnement des Eaux et Forêts - MEEF), 50y, Policy documentation and legislation of TIPAs and CAPs, 10%.

Pépé Albert Guilavogui, Student botanist, National Herbarium of Guinea, 32y, fieldwork, seed bank manager, propagation trials, 50%.

Mamadou Diawara, Executive Director Guinée Ecologie, 36y, community relations, 20%.

Colonel Sayba Keita, Director, Office Guinéen des Parcs et Réserves (OGuiPAR, MEEF), 58y, Policy documentation and legislation of TIPAs 10%.

Boubacar Diallo, Coordinator, Association Guinéenne d'Eveil au Développement Durable (AGEDD), 35y, Community and school nurseries and environmental education, 50%.

## Project partners, collaborations, stakeholders and consultations directly involved in implementing and planning this project

*Letters of Support providing written confirmation of the engagement of each of the in-country partners are available upon request.*

**Herbier National de Guinée (HNG)**, Université Gamal Abdel Nasser de Conakry (UGANC) leads botanical exploration and conservation in Guinea and identified a national Red List for plants and site-based conservation prioritisation as key areas for research collaboration with Kew. The staff and associates of HNG-UGANC, together with the students on the Masters in Biodiversity and Sustainable Development organised at HNG-UGANC in collaboration with RBGK, will provide significant input into fieldwork that will enable seed collection and gather knowledge on threats to the tree species. The HNG-UGANC nursery will be used to develop propagation of the threatened tree species.

**Guinée-Ecologie** is Guinea's premier environmental NGO. It lobbies for the protection of nature, trains students in environmental studies and techniques, and works with a network of local communities. They will provide assistance with community engagement and local language translations of posters and training materials.

**Centre d'Observation de Surveillance et D'Informations Environnementales (COSIE)**, Ministère de l'Environnement des Eaux et Forêts (MEEF) (Guinean government). Both the CBD and GBIF focal points are essential in obtaining support from government for implementation of conservation action plans, to enable incorporating threatened tree species in reforestation programmes, and to achieve official national protected status for the 27 CR/EN tree species in Guinea.

**The Office Guinéen des Parcs et Réserves (OGuiPAR, MEEF)** (Guinean government) will be instrumental in working in the buffer areas of protected areas.

**Association Guinéenne d’Eveil au Développement Durable (AGEDD)** NGO based in Maferinyah, Coyah started in 2006 and officially registered in 2011. They focus on environmental education and tree planting with plant nurseries near Coyah. Their aim is to contribute to poverty reduction by providing support to rural communities in handling sustainably their social, economic and environmental challenges. AGEDD will deliver community training and help establish nurseries in schools and villages and will aid us to deliver workshops on tree conservation and its importance.

## Project rationale:

### 1. Background and Justification:

Guinea is a major supplier of the world’s bauxite and has significant reserves of high-grade iron ore, small reserves of diamonds, gold and uranium. As a result, large areas of open cast mining exist in the country and pressure on habitats and vegetation are increasing; this is in addition to unsustainable slash and burn agriculture and a growing population which rely heavily on wood and charcoal for fuel. Fire clearance for pasture and agriculture are a serious threat to forests and communities alike. Effectively, every year the country burns end to end; uncontrolled fires are a growing problem (NASA, 2019).

Guinea has one of the highest plant diversities in Sub-Saharan West Africa and is part of the Upper Guinean Forest ecoregion (Burgess et al., 2004; WWF, 2000) and the Guinean Forests of West Africa biodiversity hotspot (CEPF, 2015). However, lowland evergreen forest is highly threatened in Guinea, with an estimated 96% of forest lost by 1992 (Sayer et al.) and losses have continued since then. This diversity is due in part to the ranges of the Fouta Djallon, Loma-Man and Nimba mountains. There are 273 endemic species in Guinea (Couch et al., 2019). There are large areas of lowland forest in Guinée Forestière (Forest Guinea), and some areas in Guinée Maritime (Coastal Guinea) though most of these forests are now highly fragmented and small (less than 1 km<sup>2</sup>), the largest intact area is found around the Kounounkan massif in Forécariah Prefecture.

The recently completed Darwin Initiative funded project called “Important Plant Areas of Guinea-Conakry” identified 9 threatened habitat types and 22 Tropical Important Plant Areas (TIPAs) in Guinea, assessed using the IPA criteria (Darbyshire et al., 2016). The TIPAs have been accepted by the Guinean government in 2019 and will receive official protected status. This project aims to conserve threatened tree species *in situ* within some of these newly designated biodiverse areas and work with the communities that border them. Data generated during this and other recent project (e.g. Species Conservation Action Plans generated during the abovementioned GBIF-BID project) will support the *in-situ* conservation actions planned in the proposed project.

The proposed project will run in tandem with a project focussing on socio-economic plant and fungi species, currently funded by the Ellis Goodman Family Foundation (which among others supports Guinean PhD students). RGBK will contribute to the proposed project as part of its TIPAs research programme and additional funding will be sought from the Darwin Initiative by the RGBK staff leading on this proposal. The Guinean government is currently putting together a funding bid for the World Bank which, if funded, will include funds for protecting the Kounounkan TIPA, which encompasses the largest area of lowland evergreen and submontane forest left in Guinée Maritime.

### 2. Summary of the conservation status of the target species

*Please also see the list of target species and habitat types above.*

*Apodiscus chevalieri* Hutch. (EN), *Keetia susu* (EN) and *Fleurydora felicis* A.Chev. (EN) are being targeted as they are threatened endemic tree species to Guinea and are restricted in habitat to crevices in the sandstone cliffs of the Mt Gangan TIPA. Protecting these tree species in the Mt Gangan

TIPA will also benefit the woody species *Fegimanra afzelii* (NT) and *Anisotes guineensis*, and the non-woody species *Cyanotis ganganensis* (EN), *Kindia gangan* (EN) and *Pitcairnia feliciana* (EN), and several endemic Melastomataceae species. The area is heavily grazed by cattle and as a result, areas are burnt several times a year to provide new grazing for cattle. The fire ravages the valleys and gorges amongst the sandstone cliffs, destroying the native vegetation and allowing invasive species to colonise. Trees in the area are also cut for charcoal production. Working with the local communities, we will reduce these activities in favour of protecting the area with firebreaks at key sites for the threatened tree species.

Forest is highly threatened in Guinea, with 96% lost already (Sayer et al., 1992). In the last decade, we have seen many forest areas reduced in size due to the demand for charcoal, especially in Guinée Maritime, where mostly small isolated patches are all that is left. *Diospyros feliciana* Letouzey & F.White (EN), *Keetia susu* Cheek (EN), *Tarenna hutchinsonii* Bremek. (CR), and *Talbotiella cheekii* Burgt (EN) are particularly threatened by this. By working with these species and the forest patches in the TIPAs where they occur, other vulnerable legume species (*Cryptosepalum tetraphyllum* (Hook.f.) Benth., \**Gilbertiodendron aylmeri* (Hutch. & Dalziel) J.Léonard, *Tessmannia baikieoides* Hutch. & Dalziel and *Baphia heudelotiana* Baill.) will be preserved and the forest patches will have a chance to regenerate. The lowland forest around Kounounkan transitions into submontane forest, with the newly discovered *Ternstroemia guineensis* (EN), in which two threatened species of *Cola* are present, *C. angustifolia* (EN) and *C. lorougnonis* (CR), which will also be targeted by the project.

The trees *Dactyadenia smeathmannii* (Baill.) Prance & White (EN) *Gilbertiodendron tonkolili* Burgt & Estrella (EN) and *Napoleonaea alata* Jongkind (EN) are all riverine forest species. The three TIPA sites all have rivers crossing their area. Riverine forest across Guinea is being cleared. This is mainly due to farming pressures. Fields are made right up to the river, making the gallery forest vulnerable when fire is used to clear the fields. Increasing the forest zone between the fields and rivers will increase water security. These species will be targeted in and around the buffer zones of the TIPA areas. Working with these species will protect other riverine species such as *Dialium pobeguinii* Pellegr. (VU) and *Placodiscus riparius* Keay (VU).

Species indicated by an asterisk (\*) have been assessed for the IUCN Red List, but their assessments have not yet been published. They are due to be published in the next release of the Red List in 2020. A preliminary conservation assessment of *Ternstroemia guineensis* has been included in the paper publishing it as new to science.

### 3. Social context:

Africa lost c. 15.6 million hectares of forest between 2010 and 2015 (www.iied.org), and biodiversity loss is accelerating, mainly due to agricultural expansion, fuelled by food demand, which is predicted to increase fourfold by 2050 (Hilderink et al., 2012). Throughout history, Africa's plant diversity has provided natural capital assets for millions of people through provisioning of material and non-material benefits (crops, food, timber, fuel) and regulating services (carbon sequestration and water-flow regulation). The regional assessment report on Africa by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2018) noted that this unique plant diversity, richness in ecosystem services, and wealth of indigenous and local knowledge is a strategic asset for achieving the UN Sustainable Development Goals (SDG), offers opportunities to mitigate threats of climate change, and can sustainably and equitably be used to reduce inequality and poverty. Sub-Saharan Africa has some of the most poverty-stricken regions in the world, areas that will be most heavily impacted by

climate change, and poverty and food security represent key challenges. The incredible natural plant resources that Sub-Saharan Africa contains may well provide solutions to these problems, but only if the plant species are properly documented and conserved.

Most people living in the target areas survive by subsistence farming and cattle ranging. They cook using firewood or charcoal. These areas are not too distant from towns e.g. Kindia or the capital, Conakry, which require a continuous vast supply of charcoal. Much of the forest has succumbed to this insatiable demand or has been cleared for farming. With more and more land needed, many of the areas recently being cleared for farming are on steep slopes leading to soil erosion.

In conserving the trees and habitats of the Mt Gangan, Kakiwondi and Kounoukan TIPAs, we will work with and educate communities about the need to preserve their environment and the livelihood benefits it will bring them. It will also provide more resilience to their local environment to mitigate the effects of climate change, protect rivers and water sources and encourage wildlife back into the area.

Establishing village nurseries will provide local employment opportunities and potentially generate income from sales of trees for planting. In some areas, the improvement in the environment may lead to new commercial initiatives such as eco-tourism.

#### 4. Goals and objectives:

**Goal: Improve the *in situ* conservation status of all 27 globally threatened (CR and EN) tree species in Guinea, by focussing on 13 tree species in three Tropical Important Plant Areas (TIPAs) in Guinea.**

**Objective 1:** By growing trees at the HNG-UGANC nursery and in school and village nurseries, increase by 10% in 3 years, the numbers of known individuals of, and reduce threats by fire to species by 50% for 13 globally EN/CR tree species in three Tropical Important Plant Areas in Guinea.

**Objective 2:** Through ongoing close cooperation with the Guinean government's Ministère de l'Environnement des Eaux et Forêts (MEEF) and our other in-country partners, achieve policy change on *in situ* conservation of globally threatened tree species in Guinea through the creation and acceptance of a National Action Plan which will provide official protected status for the 27 globally threatened (CR and EN) tree species in Guinea, and which will include them in forest reforestation programmes. As part of the proposed project, we will ensure direct implementation of this National Action Plan in the Guinée Maritime region.

**Objective 3:** Through the creation of teaching materials to be distributed in schools and by organising workshops for teachers, we aim to create public awareness, especially amongst schoolchildren, to the fact that: (1) Guinean rare and endemic tree species exist, and (2) are highly threatened by human activities and should therefore be protected to ensure a healthy environment which provides ecosystem services.

#### 5. Description of the proposed activities and justification of their effectiveness and benefits:

Consultations will be held with local communities to agree and designate areas in schools and villages for tree nurseries, agree terms to provide labour, and construct with equipment and materials bought by the project. Training will be given to communities and schools in nursery construction and maintenance, correct use of materials and plant propagation, supported by RBGK staff and the NGO AGEDD. This will ensure that we find motivated people who buy into the project and will help make it a success. Building the nurseries with local individuals will give them ownership and ensure long term survival of the nurseries beyond the scope of the project. Providing skills training will ensure a higher success rate over the course of the project. Support and monitoring of progress will be provided through weekly by phone reports and monthly inspections particularly during propagation phase



(January-June). This will allow for any problems to be resolved quickly and ensure that the nurseries are being well maintained.

Existing data on the threatened tree species will be reviewed and used to plan location and timing of seed collection of the 13 target tree species. Fieldwork to identify seed parent trees (size of populations), take cuttings and collect seed as outlined in Species Conservation Action Plans (CAPs). This approach will be applied to all species in the list. Labelling and mapping of individuals will help to monitor the population and any threats can be identified and resolved. Ensuring that seed and cuttings are collected from a large gene pool will reduce the risks of genetic bottle-necking in the propagated plants.

Germination patterns, propagation techniques and growth rates will be monitored at the HNG-UGANC nursery to develop protocols for use in future propagation. The successful methods will be passed on to the school and village nurseries for efficient plant propagation.

Planting areas for the target species within or close to newly identified TIPA sites for replanting will be identified by OGuiPAR and the villagers. This will give clarity and local partner buy-in, essential if we want villagers to protect the forest. In order to protect the existing forest, community meetings will be held to discuss and agree the installation of firebreaks. Uncontrolled fires are a major threat to the TIPA areas and fire breaks are a simple and effective solution. This will be achieved in collaboration with MEEF (Ministère de l'Environnement des Eaux et Forêts), and the NGOs AGEDD and Guinée Ecologie.

Equipment and training supplied by project to local communities to enable creation of firebreaks. Fire from field clearance and hunting is major threat, especially for small forest patches. Creating and maintaining fire belts will significantly reduce this threat.

The existing Working Group on Conservation Action plans (CAPs) and TIPAs will write a Conservation Action Plan to international standards for each of the 27 threatened tree species in Guinea with recommendations to plant threatened tree species as part of current reforestation programmes run by MEEF. The Working Group to devise recommendations for a National Action Plan over 4 meetings. Engage Forestry departments and tree planting NGOs to propagate threatened indigenous species and include them in their plantation mixes. The aim is to engage local forestry and NGO reforestation projects to use indigenous species in their plantation mixes and promote diversity in plantations over monocultures of exotic species such as *Gmelina arborea*, *Tectona grandis*, *Acacia mangium* etc. this will increase dissemination of threatened and indigenous species across the Guinee Maritime and encourage greater environmental resilience in the long term.

The list of 27 threatened EN/CR tree species with justification developed for inclusion in National Biodiversity Strategy and for national protected status, by end Year 1.

Three workshops held at HNG-UGANC with the Working Group for Conservation Action Plans (includes MEEF staff (including CBD focal point/National Protected Areas head), conservation NGOs, and University horticulturalists/botanists) to develop documents needed for incorporation by the Guinean government into legislation.

The Working Group which includes MEEF staff (including CBD focal point/National Protected Areas head), conservation NGOs, and University horticulturalists/botanists), has been instrumental in writing Species CAPs and validating the TIPA assessments, the group is well placed to write a National Conservation Action Plan for threatened trees that can be presented to the higher authorities for inclusion in legislation.

The project team, with input and review from the Working Group for Conservation Action Plans, in consultation with the Guinean Ministry of Secondary Education, to draft the text for a revised edition of the secondary schools' brochure on threatened plants and habitats of Guinea. Engage designer and printer to produce copies for dispersal through secondary schools.

Creation of school gardens and tree planting groups to plant and care for newly planted areas. This is identified in the Species Conservation Action Plans since this will engage the next generation in the need for protecting the forests and their heritage as well as their importance in combatting climate change. This will consolidate ownership over the areas and their protection, whilst collecting data on the survival rates of species.

Competition to create an emblem for the project based on the target tree species with the local schools, with the aim to use this emblem for t-shirts etc. to promote the project and engagement with the target species.

## 6. Outcomes:

Tree nurseries established in schools and villages of local communities that border each of the three target Tropical Important Plant Areas (TIPAs), and the nursery enhanced at HNG-UGANC, by end of Year 1.

Seed collecting of the 13 EN/CR target tree species delivers 1800 seeds for propagation in nurseries by end of Year 1 and end of Year 2.

The tree nurseries produce 250 seedlings of EN/CR trees annually at Year 1.5 and Year 2.5 for enrichment planting with protection from firebreaks in habitat, for incorporation in reforestation programmes, for planting in arboreta, botanic gardens, local schools (with interpretation to educate), and for sale to the gardening public.

Fire breaks installed and maintained to protect further losses at key sites of CR/EN trees species within the three target TIPAs in the first 6 months and monitored annually in November before the main fire season.

National Action Plan to recommend inclusion of indigenous tree species including EN/CR species nationwide in reforestation programmes by end Year 1.5.

Inclusion of indigenous CR/EN tree species in three Guinée Maritime province tree replanting programmes, agreed with managers by end Year 1, implementation begun by end Year 2.

National Biodiversity Strategy (Monographie National) includes the 27 EN/CR threatened tree species and national protected status provided, both by end Yr 2, to protect them nationally in law, enforcement invigilated by Ministère de l'Environnement des Eaux et Forêts (MEEF).

Incorporation of key facts on Guinea's 27 EN/CR tree species in a new expanded and revised edition of the Guide to the Threatened species and habitats for Secondary School Teachers, by end Year 2.

Awareness built in local schools and communities by creating gardens of rare plant species.

## 7. Assumptions, risk assessment and uncertainty management:

This project assumes that communities in the three target TIPAs will agree to implement measures to protect and multiply indigenous threatened tree species using firebreaks to reduce threats and nurseries to raise more trees for planting. We also assume that the staff from the Guinean Ministère de l'Environnement des Eaux et Forêts (MEEF), from partner NGOs and academic experts from RBGK that form the Working Group on Conservation Action Plans (CAPs) will continue, as in the last three years, to work productively together to review data and measures for plant conservation and recommend them to the government for acceptance in national legislation. We assume that the national government in Guinea will continue to support the implementation of TIPAs and provide them with an official protected status. These potential risks are mitigated to a large extent by the long-standing successful collaborations between RBGK and the in-country partners included in this project. If issues do occur with the Guinean government, the RBGK staff involved in this project will intervene through the British and Belgian embassies in Guinea with whom a working relationship has

been established during previous work in-country. Political and health and safety conditions remain favourable in Guinea. There have been no reported cases of Ebola since 2015. There will be presidential elections in 2020 which could cause a rise in political tensions depending on the actions of the current president. Risk of loss of conservation gains should evacuation be needed will be mitigated by the trust built up within the project partnership and the knowledge that, as before when such emergencies have occurred, RBGK will return and continue to work on the project as soon as possible.

## 8. Indicators:

### 1. Direct action on species:

#### At species level:

- *Number of globally threatened trees benefiting from in-situ conservation action:* 13 tree species, 4 assessed as CR and 9 as EN on the IUCN Red List.
- *Number of seedlings planted and/or protected (with appropriate genetic diversity) for each of the threatened tree species benefiting from conservation action:* C. 500 tree seedlings of threatened tree species propagated and 250 planted (with GPS points), and their long-term survival supported and monitored annually.
- *Number of mature individuals protected in-situ for each of the threatened tree species benefiting from conservation action:* Data not available at this stage but trees will be mapped with GPS co-ordinates ensuring future monitoring is possible. Effective fire breaks will reduce the threat of fire to target species by 50%. Fire-break maintenance will be monitored annually in the three target Tropical Important Plant Areas.
- *Number of globally threatened trees benefiting from ex-situ conservation action:* 27 CR/EN tree species endemic to Guinea including the 13 target species for in-situ conservation. Not all 27 species are viable for seedbanking, those that are not will be grown ex-situ in botanical gardens.

#### At habitat level:

- *Number of hectares of protected areas with strengthened management of threatened trees diversity:* 11055 ha approximately.
- *Number of hectares of protected areas with dedicated management of threatened trees diversity created or expanded:* 56210 ha approximately
- *Number of hectares of Key Biodiversity Areas for trees with improved management:* 3 Tropical Important Plant Areas (total size 67265 hectares)

### 2. Threat reduction

- *Number and categories of direct beneficiaries from activities providing alternative livelihoods:* We will focus on communities in the buffer zones of 3 Tropical Important Plant Areas: e.g. Mayon Kouré, Koba Pastoria, Yembé and Kébé Friguia (Mt Gangan), Tomboya and Kaporo (Kakiwondi) and Gbérébun, Sansanwori, Dalonia, Gombokori and Sikourou (Kounounkan).
- *Number and categories of people directly targeted by awareness raising activities:*
  - (1) 10 Communities in the buffer zones of 3 Tropical Important Plant Areas;
  - (2) Secondary school children through:
    - (a) 3 School gardens with threatened species and nurseries fully established and maintained by students;
    - (b) Second edition of schools' brochure including 27 CR/EN tree species published and distributed across Guinea;

(3) Workshops for Ecoguards, MEEF and project stakeholders on benefit of protecting forest and fire breaks.

(4) 200 improved cook stoves distributed among target communities to reduce pressure on forest resources and raise awareness.

• *Number of hectares with strengthened law enforcement activities targeting illegal logging:*

Government protected status formulated and tabled to protect nationally by law the listed 27 EN/CR threatened tree species.

The Kounounkan TIPA is set to become a new National Park and this will have permanent Ecoguards resulting in c.4000 ha being actively protected against illegal logging.

### 3. Enabling conditions

• *Number of organisations with improved organizational capacity:*

- Increase in number of temporary staff: AGEDD (1), Herbier National de Guinee (1).

• *Number of direct beneficiaries and categories benefiting from education and training activities:*

- 10 MSc Students taught on Site and Species based conservation strategies,
- 9 Secondary school teachers trained in conservation education and nursery management,
- 12 Project partners: working group supported to produce CAP for threatened tree species,
- 15 Ecoguards and local forestry officers: Training on TIPAs and plant conservations.

• *Number of scientific papers published (including description of new species):* 2. At least one on the Conservation Action Plan for threatened tree species of Guinea and one other e.g. on the approach to protecting TIPAs through community participation.

• *Number of Key Biodiversity Areas for trees identified:* We recently identified 22 Tropical Important Plant Areas in Guinea, this project will work in 3 of them.

• *Number of Tree Conservation Action Plan published:* Of the 13 target tree species, 4 already have a published Conservation Action Plans (CAP). We aim to write an overarching CAP for threatened Guinean tree species with recommendations to include EN/CR species in planting and ratified by the Guinean government.

### 9. Long term sustainability and replicability:

By engaging with the forestry department, the target tree species and other indigenous tree species can be incorporated into the national reforestation planning.

Over the three years of the project, we aim to build sufficient capacity and collaboration between the local communities and the government departments of forestry and National Parks that the nurseries can continue to produce indigenous threatened tree seedlings for wider replanting schemes.

The project will be fully documented with the propagation protocols and other documents freely available through the website of the National Herbarium of Guinea (HNG-UGANC).

By including the national parks service (OGuiPAR) as a project partner, the areas will continue to be protected after the end of the project.

### 10. Communication:

All project activities will be communicated through the HNG-UGANC website

([www.herbienguinee.org](http://www.herbienguinee.org)) and via Twitter (@HerbierGuinee and @KewAfrica) and the HNG-UGANC Facebook account. Partner organisations will be encouraged to share documentation through their own social media and websites. All documents will be shared with the partner organisations and will be freely available online. Workshops will be publicised on national radio and television. The

secondary schools' brochure will be widely distributed in Guinea with help of the Ministry for Secondary Education.

### 11. Legal aspects:

The Royal Botanic Gardens, Kew (RBGK) and the National Herbarium of Guinea (HNG-UGANC) have a Memorandum of Understanding (MoU). This agreement has been in place since 2009. This allows for sharing of specimens, seed and other plant materials, including to 3rd parties for research purposes. The project will adhere to the CITES legislation and CBD protocols in relation to access and benefit sharing. The in-country project partners include several departments of the Guinean Ministère de l'Environnement des Eaux et Forêts (MEEF) including the CBD focal point and the head of the National Protected Areas agency (OGuiPAR). This partnership will ensure that any authorisations required to implement the activities presented in this proposal are provided, as well as give the insurance that local, national and international legislations will be followed.

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