

Applicant: **Lehavana, Adolphe**
Organisation: **Missouri Botanical Garden, Madagascar Research and Conservation Program**
Funding Sought: **£584,364.00**

DIR31S2\1058

Developing a model for lucrative, productive and green charcoal production.

In Madagascar, population growth, dependence on charcoal for cooking and inefficient charcoal conversion leads to non-sustainable harvesting of native trees. Conservation requires improved methods of charcoal production and alternative sources of wood. This model project shows how this can be achieved within the landscape of Pointe-à-Larrée by enabling locals to adopt improved charcoal production methods (from Benin), by developing and supporting value chains from innovative products (green charcoal and wood vinegar), and by exploiting the invasive pyrophilic alien *Melaleuca quinquenervia*.

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Section 1 - Contact Details

CONTACT DETAILS

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Type	Organisation
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Section 2 - Title, Ecosystems, Approaches & Summary

Q3. Project title

Developing a model for lucrative, productive and green charcoal production.

Please upload a cover letter as a PDF document.

What was your Stage 1 reference number? e.g. DIR31S1\1123

DIR31S1\1181

Q4. Response to Stage 1 feedback

You must explicitly set out how and where you have addressed all the comments/feedback in the application form: briefly restating the feedback point, then clearly setting out how you have responded to it in the application.

Reviewer's comment:

1. It appears the project will only focus on testing and creating Melaleuca products, even though post-clearance the land will be replanted with other species. If charcoal yields and vinegar yields from these species are poor (or impossible) the project will only work in the short term.

Response: Yes, we will focus solely on Melaleuca products with the aim of controlling this species over the Pointe à Larrée peninsula. This project is founded on an ongoing project, funded by the DI (end in March 2025), which although challenging, is yielding positive results: Melaleuca controlled over >50Ha and > 20tons of green charcoal produced and delivered to local/regional markets. More importantly, we have gained experience how to combat this highly invasive species and transform this problem into an advantage for local communities.

In the project proposed, we will scale-up both number of beneficiaries (x2) and target areas freed from invasion (50Ha to 500Ha). In Benin, the monetary value of wood vinegar is much higher than that of charcoal. Briefly, at least in the five years of the project (until 2030), the project will be profitable and once the raw materials are finished (Melaleuca population controlled), we will turn for raw materials to other invasive alien species in the area such as Grevillea banksii which is locally abundant and also trees grown in reforestation plots. All woody plants can be converted to charcoal and also produce wood vinegar albeit the qualities of the wood vinegar vary between species. Hence, if we are in the fortunate position of having controlled Melaleuca within a specific landscape, then new trials we will required to evaluate the qualities of wood vinegar produced by other tree species.

2. The poverty reduction angle seems to rely heavily on the project being able to establish markets for wood vinegar and green charcoal. The proposal could be strengthened with a clear explanation on which partners have the expertise in developing marketing and investment plans to ensure the products produced will have access to the appropriate markets.

Response: Among the partners, the team from Ministry of Industrialization, Trade and Consumption has expertise in marketing and commercial strategy. To be sure of expected results, we propose to recruit a consultant to train the NGO MAZAVA-Nature to acquire capacity on marketing and commercialization. Afterwards, they will provide coaching to the members of charcoal Cooperative. This capacity building program is described in detail in section Q16.

3. It is not clear how affordable and robust the casamance kiln is: for example, will producers be able to afford to buy and maintain them once the project finishes.

Response: According to the experiences of CoForMO team in Benin (one of the partners), the lifespan of a metal Casamance kiln is one year. Indeed, this is quite short and could pose an investment problem if it is not taken into account in the Cooperative's business plan. To ensure that the investment can be sustained, we will include a depreciation fund for this equipment in the business plan. We acknowledge that long-term profitability depends on the Cooperative's ability to generate adequate revolving funds to maintain all equipment. It should be noted that the kilns will be made locally.

4. While attention is paid to gender, there is no mention of the inclusion of others such as marginalised groups.

Response: This has been addressed in Q17. Gender Equality and Social Inclusion (GESI)

5. Clarify who the target beneficiaries of the project are – are they poor people?

Response: Yes, all target beneficiaries are poor and vulnerable people: according to World Bank Data over 80% of rural Malagasy live in poverty. The project will be implemented in a cyclonic zone where agricultural activities (cloves and vanilla plantations) are uncertain. This situation is exacerbated by the effects of climate change. To cope during times of

hardship, before the creation of the Pointe à Larrée protected area, families resorted to the exploitation and sale of wood from native trees (timber and charcoal) which constituted more than 90% of household income. Since the creation of the protected area in 2015, this activity is no longer accepted and the charcoal producers are turning to the extraction of dead wood which has become increasingly scarce. In recent years, their income has fallen significantly. The surveys that we conducted in 2023 showed that daily income of a charcoal producers is evaluated around Ar5,183 (■■■■ or ■■■■, slightly lower than income threshold for extreme poverty indicated by Sustainable Development Goals (SDG) benchmark of ■■■■ a day.

6. It would be interesting to capture whether improved densities of Lepironia mucronata in marshes freed from Melaleuca resulted in increased weaving income for women (as stated in proposal narrative).
Response: No, currently, there is ample Lepironia mucronata to meet the needs of basketry raw materials for women. But, with the expansion of the Melaleuca population, especially during the last decade, we have noticed a significant shrinking of occupied surface by Lepironia mucronata due to direct competition with Melaleuca and because the Melaleuca promote drying of this sedge’s marsh habitat. thus control, while having no impact now, would help ensure supply in the future that would be reduced if actions are not taken now.

7. The logframe and approach to Monitoring and Evaluation could be strengthened by: a) including more GESI targets; b) ensure indicators are SMART and do not read as activities (for example, indicators 4.4, 4,5 and a number Output 5 indicators) – indicators should be able to measure achievement and impact as a result of activities carried out; c) ensuring all indicators are timebound (indicators 4.4 & 4.5 are not timebound); d) clarify if numbers of charcoal producers in indicator 0.5 targets are cumulative or additional each year.
Response: Yes, agreed and we have addressed all these comments in the revised log frame

Q5. Key Ecosystems, Approaches and Threats

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

Biome 1

Tropical-subtropical forests

Biome 2

Freshwater Realm (Lakes)

Biome 3

Palustrine wetlands

Conservation Action 1

Land / Water Management

Conservation Action2

Livelihood, Economic & Moral Incentives

Conservation Action 3

Institutional Development

Threat 1

Biological resource use (hunting, gathering, logging, fishing)

Threat 2

Invasive & other problematic species, genes & diseases

Threat 3

Natural system modifications (fires, dams)

Q6. Summary of project

Please provide a brief non-technical summary of your project: the problem/need it is trying to address, its aims, and the key activities you plan on undertaking.

In Madagascar, population growth, dependence on charcoal for cooking and inefficient charcoal conversion leads to non-sustainable harvesting of native trees. Conservation requires improved methods of charcoal production and alternative sources of wood. This model project shows how this can be achieved within the landscape of Pointe-à-Larrée by enabling locals to adopt improved charcoal production methods (from Benin), by developing and supporting value chains from innovative products (green charcoal and wood vinegar), and by exploiting the invasive pyrophilic alien *Melaleuca quinquenervia*.

Section 3 - Countries, Dates & Budget Summary

Q7. Country(ies)

Which eligible host country(ies) will your project be working in?

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

Do you require more fields?

☒ No

If you are proposing to work in an Upper Middle Income Country (see Annex A), please demonstrate your case for support with reference to one or more of the criteria in Section 2.8.

N/A

Q8. Project dates

Start date:	End date:	Duration (e.g. 2 years, 3 months):
01 April 2025	31 March 2030	5 years

Q9. Budget summary

Year:	2025/26	2026/27	2027/28	2028/29	2029/30	Total request £
Amount:	£156,132.00	£81,651.00	£109,048.00	£109,338.00	£128,195.00	£ 584,364.00

Q10. Do you have matched funding arrangements?

☒ Yes

Please ensure you clearly outline your matched funding arrangement in the budget.

Q11. If you have a significant amount of unconfirmed matched funding, please clarify how you will deliver the project if you don't manage to secure this?

From June 2026, The Livelihoods Fund for Family Farming (L3F) will take over certain activities of FFEM for two years (end June 2028) for an amount of £74,637 (to be confirmed) as co-financing of the Darwin Initiative. Confirmation will be known in December 2024. In the case that L3F funding is not approved, MBG commits to find another source of funding to ensure Darwin Initiative co-financing from June 2026. In addition, MBG is committed to finding additional co-financing from 2028 to project end to ensure that project is financially well supported.

Q12. Have you received, applied for, or plan to apply for any other UK Government funding for your proposed project or similar project?

☒ No

Section 4 - Problem statement

Q13. Problem the project is trying to address

Please describe the problem your project is trying to address in terms of biodiversity and its relationship with multi-dimensional poverty.

Wood energy represents 70% of the energy consumed in Africa and this rises to 90% in Madagascar (Madon, 2017; MEH, 2017). The exploitation of forest products, 81% of which are consumed to provide domestic energy, is a growing pressure on forest resources, leading to annual loss and degradation of forests estimated around 90,000 Ha annually in Madagascar (MEEF, 2018). The annual production of charcoal in Madagascar reaches 617,658 tons (Stock-taking USAID, 2008). The projection of the relationship between annual consumption and production shows that from 2027, the country will have a deficit in wood energy due to population growth, estimated at 2.38% per year (Statistical Research Department, 2024). Around the Pointe à Larrée Protected Area, annual consumption of charcoal is 5,653 tones, 78.6% of which comes from native tree species (Lehavana et al., 2024). Alternative energies (gas, electricity, solar, etc.), which represent around 12% of primary energies, are difficult to access and too expensive for poor rural populations with an estimated annual income of US \$510 (MEH, 2017; Banque Mondiale, 2022). The low carbonization yield, estimated at 10 to 12%, is a major factor contributing to this energy wood deficit in Madagascar (CIRAD, 2018). This quietly but rapidly developing crisis could compromise the conservation of Madagascar's 101 terrestrial Protected Areas (Area =6.23 million Ha).

The Pointe à Larrée PA on Madagascar's central-eastern coast is an old dune complex including very rare littoral forest and swamp forest, marshes and lakes supporting rich fauna and flora including scores of threatened and locally endemic species (<https://mobot.mg/conservation/pointe-a-larree-site/>). This natural wealth is threatened both by the non-sustainable exploitation of native trees by impoverished local people for timber and fuel to satisfy high local and regional demand for charcoal and by the impact of a number of alien invasive plants, - the most significant is the marsh-loving pyrophile tree *Melaleuca quinquenervia*, because it dries marshes, promotes wild fires and out-competes native woody plants. Most local people living in this landscape are subsistence farmers or fisherfolk and have precarious lives - often impacted by environmental events (floods, droughts, catastrophic winds, fires) which have become increasingly prevalent and frequent due to the effects of climate change. Several other PAs in Madagascar have similar problems as Pointe à Larrée.

Globally, in the medium term, rural populations will need to change their traditional preference for cooking using charcoal and wood and be provided with access to renewable sources of energy (wind, solar etc). However, in the short term, until this transition can be made, this problem requires a pragmatic solution, on the one hand taking into account the external environment, the market, the ability and willingness to pay a fair price for "green" or "greener" products and, on the other hand, the efficiency of charcoal production needs to be improved and new sources of wood, other

than native trees, must be accessed (Gendron, 2006). This project will provide a model of how this can be achieved within Pointe à Larrée peninsula in a manner that is scalable to other regions.

Section 5 - Darwin Objectives and Conventions

Q14. Biodiversity Conventions, Treaties and Agreements

Q14a. Your project must support the commitments of one or more of the agreements listed below. Please indicate which agreement(s) will be supported.

- ☒ Convention on Biological Diversity (CBD)
- ☒ Ramsar Convention on Wetlands (Ramsar)
- ☒ United Nations Framework Convention on Climate Change (UNFCCC)
- ☒ Global Goals for Sustainable Development (SDGs)

Q14b. National and International Policy Alignment

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

Madagascar has ratified 22 conventions with national action plans and this project is aligned with three of them:

1) Convention on Biological Diversity (CBD) (ratification in Madagascar: decree n°95-695, 3 November 1995) and its implemented with the National Biodiversity Strategy and Action Plan (NBSAP) for the sustainable management of biodiversity (2015-2025). This project contributes to four targets: a) T4: Sustainable consumption and production > valorizing wood vinegar to extend the longevity of construction wood and increase the carbonization yield by 2.5 times; b) T7: sustainable agriculture > by increasing agricultural yield through the use of wood vinegar as an organic fertilizer and natural pesticide; c) T9: Invasive Alien Species prevented and controlled > by promoting the use of Melaleuca quinquenervia, an invasive species as raw material; d) T19: Knowledge improved, shared and applied > by introducing the Casamance Kiln (a new carbonization technique) to Madagascar from Benin.

2) United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Climate Agreement (Law No. 2014-022 of 10/12/14 ratifying the Doha Amendment to the Kyoto Protocol and Law No. 2016-019 of 10/08 /16) which aligns with National Plan for Adaptation to Climate Change (PANLCC) of Madagascar. Regarding Nationally Determined Contributions (NDCs), under the Paris Agreement to reduce greenhouse gas emissions, most recently, on 29/01/2024, Madagascar presented NDC2 describing sectorial strategic planning for 2030 to combat climate change (<https://unfccc.int/NDCREG>). This project contributes for sectors forestry and energy to mitigation and adaptation measures. For Energy Sector, this project contributes to Strategic Priority 3 by promoting Casamance techniques with a yield > 20% greater than current methods; and for the Forestry Sector, this project aims to reforest 65 ha/year contributing to national objective of 75,000 ha/year.

3) Ramsar Convention on Wetlands (ratified in Madagascar 24/03/98, Resolution VII.14, 7th Meeting in 1999) deals specifically with promoting adequate measures on the prevention, eradication and control of invasive species in favor of wetland conservation. The Pointe-à-Larrée is dominated by wetland ecosystems where Melaleuca is seriously impacting ecological functionality. This species dramatically dries up water resources through high evapotranspiration and alters hydrology (MAZZOTTI et al. 1997). Combating to Melaleuca aligns with the Fourth Ramsar Strategic Plan 2016-2024, Goal 1: "Addressing the Drivers of Wetland Loss And Degradation" in which it fits into Target 2: "Water use respects wetland ecosystem needs for them to fulfill their functions and provide services at the appropriate scale inter alia at the basin level or along a coastal zone", and Target 4: including priority invasive alien species are controlled or eradicated (https://www.ramsar.org/sites/default/files/documents/library/ramsar_convention_strategic_plan_poster_english.pdf)

4) Convention on Sustainable Development comprising 17 objectives, ratified following Decree No. 95-032 of January 11, 1995. The optimization of various products from Casamance Kiln developed in partnership with Benin's competence, will align with several goals of this Convention to: income improvement (Goal 1); energy (Goal 7); Industrialization, innovation and infrastructure (Goal 9); Climate action (Goal 13).

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

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 similar 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.
- how you will **manage the work** (governance, roles and responsibilities, project management tools, risks etc.).

MBG has managed Pointe-à-Larrée reserve for 16 years: promoting community-based conservation and income-generating activities for locals. During this period, we learned how to work successfully with locals. In addition, three of the five partners have worked together over the last three years implementing a similar project (end March 2025) and we have acquired valuable experience in how to combine our expertise to deliver a coherent project.

1) Clarification of partners' roles

At launch, the roles and responsibilities of each partner will be defined through a memorandum of understanding to ensure that all parties know their rights and responsibilities aligned with a detailed planning of activities. For tracking progress we will organize bi-monthly meetings and semi-annual participatory monitoring of work.

2) Strengthening partners' skills

The five project partners are multidisciplinary and have significant experience and know-how in their respective fields. Moreover, two partners are representatives of Ministries with detailed understanding of applicable regulations and laws. Each partner brings its expertise in capacity building, framing and guiding the actions of the community interfaces (the Cooperative of Charcoal Producers and Federation Lovasoa) and also in promoting international exchange between Benin and Madagascar.

3) Completing the gaps from external expertise

The partners have an array of expertise (botany, birds, micromammals, conservation, marketing), but there is still skill gaps for which consultants will be recruited, e.g. development of a business plan and marketing strategy, communication and fish inventory. This approach will be described in detail in Q16.. To better understand the biochemical properties of Melaleuca wood vinegar and its potential uses, analyzes of samples will be conducted in recognized laboratories in the UK and Madagascar.

4) Capacity building of local stakeholders

The majority of stakeholders have already received capacity building on several themes during the ongoing project. As we aim to expand the project in term of beneficiary number (with new members) and the scale of the area within entire Pointe à Larrée peninsula), it is essential to carry out a training program for new members through a cross-training conducted by those members who are already experienced.

5) Allocation of appropriate and adequate resources and materials to stakeholders

At project start, the material and financial resources needed for each stakeholder will be identified. This has been budgeted so that everyone can work without material constraints. For product marketing, we propose to build a sales center in regional capital that will also include an equipped office for the Cooperative and MAZAVA NATURE.

6) Promote innovative, lucrative and environmentally friendly techniques

In the current project we have used improved traditional techniques for charcoal production with an average yield of 20%. In Benin, the Casamance technique yields up to 28% and also produces a valuable by-product (wood vinegar) which has the virtue of a natural pesticide and fertilizer (Dossou et al. 2014; Ouattara, et al. 2023). The Casamance technique and wood vinegar are new in Madagascar and their promotion could: reduce the volume of wood consumed for construction (by extending the longevity of timber treated with wood vinegar), increasing energy conversion from Melaleuca wood, and combating pests of rice and vegetable crops.

The project proposes a massive removal of Melaleuca trees by promoting their exploitation for charcoal and then mobilizing women to weed regenerating plants. Post-removal of Melaleuca, some previously occupied zones will be replanted with non-native but noninvasive fast-growing alien trees and, other zones, at key locations (e.g. to increase the integrity of the native forest), will be planted with native trees. Reforestation on this poor sandy soil will be facilitated through use of biochar (also made from green charcoal).

7) Involvement of stakeholders in the project

Three categories of stakeholders can be identified: local communities, urban consumers and decision-makers. At project inception, we plan to conduct awareness-raising through village meetings for local communities informing them about project goals and requesting feedback that will be used to improve the project. The business plan and manual of procedure will be revised for the local cooperative to ensure that the investment is beneficial both individually (charcoal producers) and collectively (cooperative as an entity).

For potential consumers, partners will participate in various events (economic fairs, celebration of World Environment Day, biodiversity festivals etc.) to encourage consumption of products. To promote customer loyalty, we will privilege product quality, ease of access, availability and fair pricing. For decision-makers, a regional launch will be organized and exchange workshops between Benin and Madagascar developed with the objective of promoting the integration of our work into national policies on energy, biodiversity conservation and economic development.

Q16. Capability and Capacity

How will the project support the strengthening of capability and capacity of identified local and national partners, and stakeholders during its lifetime at organisational or individual levels? Please provide details of what form this will take, who will benefit (noting GESI considerations), and the post-project value to the country.

Partners and stakeholders have necessary skills to implement their respective roles, so capacity building program will be dedicated to the new NGO MAZAVA-NATURE which was recently created. It is formed by young multidisciplinary academics, composed of 12 founding members, specialized in botany, birds, micromammals, analysis of spatial information, management and in rural socio-organization. In this project, MAZAVA plays a crucial role as the direct coach of the Cooperative. An evaluation of the MAZAVA team showed that there is a lack of competence in three key areas: marketing and commercial strategy, communication and the fish sector. Also, these skills do not exist or are quite superficial among the partners. Hence we will engage external expertise by recruiting national consultants to address these gaps. Once these three themes have been provided, the MAZAVA team will provide direct coaching to the Cooperative in implementation of the business plan, marketing and commercial strategy. This basic document (that exists already) requires revision taking into account the new product wood vinegar and the scope of the project. To do this, a Consultant will be recruited.

In addition to technical support, we plan to provide materials and equipment support to MAZAVA so that members can fulfill their roles and responsibilities.

At the end of this accompaniment, MAZAVA is expected to be capable of leading this project and others of similar orientation. In this perspective, in 2027, MAZAVA proposes to support Cooperative Samy Antsika to extend their activities around two additional Protected Areas (Tampolo and Analalava) in collaboration with the managers. This will allow the team to demonstrate their abilities to accomplish their mission.

Q17. Gender Equality and Social Inclusion (GESI)

All applicants must consider whether and how their project will contribute to promoting equality between persons of different gender and social characteristics. Please include reference to the GESI context in which your project seeks to work. Explain your understanding of how individuals may be disadvantaged or excluded from equal participation within the context of your project, and how you seek to address this. You should consider how your project will proactively contribute to ensuring individuals achieve equitable outcomes and how you will ensure meaningful participation for all those engaged.

In the region where this project will be implemented, our analyses reveal that women are poorly represented in Associations and they are only rarely leaders, hence they are little involved in decision-making. For example in the Melaleuca Green Charcoal Cooperative (Samy Antsika), among the seven members of the Board of Directors, there is only one woman. In this project, we want to rectify this imbalance by strengthening the responsibilities of women through awareness-raising action and providing intensive support to women leaders.

The production of green charcoal requires physical force, often reserved for men, but women can actively collect wood

vinegar, sell products and especially remove young Melaleuca trees as part of the control protocol. The extraction of Melaleuca in the marshes will promote the natural regeneration of *Lepironia mucronata*, the main raw material for weaving and currently threatened with increasing rarity due to the invasion of Melaleuca and the consequent drying out and burning of the marshes. The project will thus enable women to continue to carry out this lucrative activity sustainably into the future – funds which are often used by mother's for schooling. In this project, both women and men will receive the same opportunities, treatment and post-related financial compensation.

In term of inclusion, single mothers, are the groups that are especially vulnerable because of burdens they bear, they are less competitive and quite marginalized in the village. In this project, we propose to prioritize their membership when giving them more of a chance to support their families.

Insecurity is one of the reasons why women do not participate in work in the forests. To mitigate this, we task Federation Lovasoa to promote group work, for reforestation and restoration program and forest patrols on which women have now become increasingly active.

Q18. Change expected

Detail the expected changes and benefits to both biodiversity and multi-dimensional poverty reduction, and links between them, that this work will deliver. You should identify what will change and who exactly will benefit a) in the short-term (i.e. during the life of the project) and b) in the long-term (after the project has ended).

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

This project will demonstrate, over a model landscape, how, in the short-medium term, Madagascar can reduce pressures on native forests as a source of charcoal by working with locals to use new protocols to efficiently transform a troublesome alien invasive tree into lucrative products. This demonstration will be powerful because of the tangible changes demonstrated in the landscape including:

- a) conservation of rare littoral forest and the important resident biodiversity over the entire peninsula (ca. 3,915 Ha including the Pointe à Larrée PA with 770 Ha) by implementing an array of activities (forest patrol to reduce timber logging and fire prevention). By reducing threats, natural regeneration will allow the forest to develop a more natural structure thereby enhancing its resilience to face multiple effects of climate change.
- b) control of Melaleuca quinquenervia over the entire peninsula (ca. 500 Ha infested within a total area of 16,455 Ha) leading to a reconstitution of more natural aquatic ecosystems thereby increasing ecosystem services supporting local livelihoods.
- c) restoration of 215 Ha of marshes, naturally rich in sedges, that was previously infested with Melaleuca, with consequent increase in the populations of threatened aquatic species (including water birds and fish) and ensuring future availability of raw materials (sedge) for weaving.
- d) replacement of Melaleuca as a source of charcoal with 300 Ha of plantations of fast-growing non-native but non-invasive trees and planting native tree species over 25Ha to launch restoration of native forest at key locations.
- e) improvement in income by 100% for 200 local charcoal producers based on a new and sustainable value chain of Melaleuca products and the local adoption of new techniques for charcoal production that increases conversion by 2.5 times over traditional methods.
- g) Melaleuca green charcoal becomes a local and regional preference. From project inception, the quantity of green charcoal consumed increases annually, reaching 180 tons by YR5, accessible in all surrounding towns to the detriment of charcoal of native species. Also by ensuring product availability even at times of cyclone impact, help maintain social stability.
- f) the new product wood vinegar from Melaleuca, known as a natural pesticide, is introduced to the market with a production reaching 3000 liters in YR5. Its use will contribute help protect wood and crops from insect attacks to the detriment of harmful and expensive chemical pesticides.

If, as anticipated, we can demonstrate these changes over the landscape of Pointe-a-Larree, then there would be huge potential to rollout this approach elsewhere because the whole eastern coastal zone of Madagascar is infested with Melaleuca and suffers, like at Pointe-à-Larrée, from the consequences of invasion. Value could be restored to tens of thousands hectares of currently unproductive land. On a broader scale, if this model is adopted by decision-makers in

the development of national multi-sector policy (energy, biodiversity conservation and rural development), greater impacts across Madagascar are expected.

Q19. Pathway to change

Please outline your project's expected pathway to change.

Our theory of change addresses two fundamental problems: 1) the low carbonization yield that cannot accommodate the increase in consumption needs induced by population growth and 2) the current preference to produce charcoal from heavy wooded native species rather than alien species because of the low conversion of the latter. Together these problems result in protected areas being raided as a source of wood for energy.

Our Theory of Change is that IF highly productive and lucrative charcoal production based on an invasive alien species is demonstrated, and IF green charcoal of Melaleuca and wood vinegar are appreciated and consumed by locals who remain loyal to certified products (due to high quality, quantities and effects of communication), THEN Melaleuca products will conquer the regional market reducing, progressively, dependence on native species THEREBY Melaleuca products will provide a stable and improved source of income for locals while enhancing ecosystem restoration within Pointe à Larrée Peninsula. With this model of success replication will be facilitated in other areas suffering from Melaleuca invasions along the east coast of Madagascar.

Q20. Sustainable benefits and scaling potential

Q20a. How will the project reach a point where benefits can be sustained post-funding? How will the required knowledge and skills remain available to sustain the benefits? How will you ensure your data and evidence will be accessible to others?

Sustainability of actions depends largely on the Cooperative's capacity, based on three parameters:

- 1) financial and managerial capacity to make operations profitable. Although slow, there is a technical improvement of the leaders. The current business plan envisages an annual collective profit of £9,700 for the cooperative, not including individual profits. This should allow the cooperative to continually reinvest. The new wood vinegar product constitutes additional added value to turnover;
- 2) capacity to group management. Previous experiences have shown that poor management (e.g. embezzlement, lack of management transparency) could create tension leading to members withdrawing. The manual procedures has anticipated this risk and applies measures to reduce such risk ;
- 3) ability to effectively implement the marketing and commercial strategy. All partners will support them to succeed. From YR2, a series of information sharing will be planned allowing the targets (charcoal producers, Melaleuca product uses, decision-makers, conservationist) to promote the model.

Q20b. If your approach works, what potential is there for scaling the approach further? Refer to Scalable Approaches (Landscape, Replication, System Change, Capacitation) in the guidance. What might prevent scaling, and how could this be addressed?

The scaling of the project will be planned under responsibly of MAZAVA-NATURE. Skills and capacity building acquired by this organization during the first two years of the project, at the end of which they must have the capacities to replicate the approach in other regions. On the east-cost of Madagascar, with potential support of the Malagasy government under energy and conservation policy, MAZAVA-NATURE expects to lead the cooperative Samy Antsika in expanding their actions around Tampolo and Analalava Reserves, located within 150km from Pointe à Larrée by collaborating with the managers of these protected areas. These sites suffer similar problems from the Melaleuca invasion. Moreover, they are located very close to the town of Fenerive-Est where the sales infrastructure will be built, the chance of successful expansion is high because the problem of transporting products which is the current major handicap will be reduced.

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

Section 7 - Risk Management

Q21. Risk Management

Please outline the 7 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, two Safeguarding, and one Delivery Chain Risk.

Risk Description	Impact	Prob.	Gross Risk	Mitigation Header	Residual Risk
Fiduciary (financial): funds not used for intended purposes or not accounted for (fraud, corruption, mishandling or misappropriated). Misappropriation of funds at the level of the charcoal producers' Cooperative, creating tension between members and leading to a gradual withdrawal of charcoal producers	Major	Almost certain	Major	All revenues will be immediately paid into the bank account and monthly monitoring of transactions and the Cooperative's account will be carried out by technicians, financial restitutions will be scheduled every six months, annual audit of the Cooperative's operations.	Minor
Safeguarding: risk of sexual exploitation abuse and harassment (SEAH), or unintended harm to beneficiaries, the public, implementing partners, and staff. MBG's employees, partners, consultants executing missions engage in abuse of power, sexual harassment, bullying, exploitation and abuse, employment of minor children and any other behavior against good conduct.	Moderate	Possible	Moderate	In early 2025, we organize an information session for partners to explain strict compliance with MBG's Safeguarding Policy. Also all consultants, interns, and visitors are also informed to strictly respect of these rules. A national and based-site safeguarding focal points have been appointed and tasked with applying the complaints process.	Minor

Safeguarding: risks to health, safety and security (HSS) of beneficiaries, the public. Implementing partners, and staff.

A large part of Pointe à Larrée peninsula are aquatic (river, lakes, river mouths), stakeholders must use a lot of travel by canoe, boat for work. There is a risk of shipwreck which could lead to death.	Moderate	Almost certain	Moderate	Recruit a professional skipper for motorboat. Enforce rules to: prevent use of any vessel in bad weather, overloading and ensure use of a life jacket. A rescue system will also be set-up with the other two MBG's on-site motorboats.	Minor
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Delivery Chain: the overall risk associated with your delivery model

Charcoal production is poor because of climatic events or few people are interested in buying this products, then revenue of charcoal producers falls, they abandon the activity. For cooperative, activity is not lucrative and the members no longer want to continue the business.	Severe	Unlikely	Major	Organise production strategy (including stockpiling) to ensure supply is reliable and responsive so that it always matches demand. Ensure conception, implementation and review/adaptation of marketing strategy to maintain clients and attract new clients. Provide centralized holistic oversight and direction of the diverse partners to attain a shared objective.	Moderate
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Risk 5

The results of laboratory biochemical analysis of wood vinegar of Melaleuca shows that it presents a risk of toxicity to human health and the government does not authorize its use for agricultural and any other use purposes.	Major	Rare	Moderate	Currently we are treating wood vinegar as a bonus albeit that this bonus could determine overall commercial viability of this project. It is possible the toxicity issues could be addressed with special application protocols for certain uses. High-level researchers may be able to suggest processing interventions that would eliminate toxicity.	Minor
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Risk 6

Local communities oppose the removal of Melaleuca populations throughout Pointe à Larrée peninsula because they use a lot timber of the species for their daily needs and its removal could increase pressures on Pointe-à-Larrée PA.	Major	Almost certain	Major	Intensively strengthen people's awareness of the long-term impacts of the species on ecosystem services and providing alternative by supporting plantations of fast-growing, non-invasive and multiple-use trees, species, and supporting the rational use of existing reforestation plots.	Moderate
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Risk 7				
If the Melaleuca populations removed every year, the Cooperative's charcoal raw materials gradually decrease until they are completely exhausted towards the end of the project. Consequently, cooperative's business plan will be compromised, turnover will drop and the project will collapse.	Severe	Almost certain	Severe	Local charcoal producers must turn to the exploitation of other invasive species such as Grevillea and Acacia. It is also likely that some of our plantations of alternatives will be ready for exploitation. The cooperative could also expand their investment to other areas close-by where Melaleuca trees remain abundant.
				Moderate

Q22. Project sensitivities

Please indicate whether there are sensitivities associated with this project that need to be considered if details are published (detailed species location data that would increase threats, political sensitivities, prosecutions for illegal activities, security of staff etc.).

☒ Yes

Please provide brief details.

For forest restoration at Pointe à Larrée, we will use some species of rosewood and ebony from Madagascar, all of which are listed in Appendix II of CITES

As these species have been the focus of a lucrative and illegal international trade MBG has taken initiative of not publicly sharing their locations (including hiding the geographic coordinates of these species in publications and botanical databases). It is likely that these species will be included among the target species for the restoration of native forest but we would not want to publicise their presence at this site.

Section 8 - Workplan

Q23. Workplan

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

 [BCF Workplan Template 2024-25 DIR31S11181_FI](#)
[NAL-MBG-PAL](#)
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Section 9 - Monitoring and Evaluation

Q24. Monitoring and evaluation (M&E)

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

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

Based on workplan, data will be collected on a continual basis by different partners. At the start of the project, under the leadership of the Project Director, the partners will establish a monitoring plan to clarify responsibility and frequencies of monitoring for each activity. To do this, each partner will monitor its own achievements, either monthly,

bimonthly or quarterly. As an exception, because CoForMO is not present in Madagascar, MAZAVA monitor the change resulting from training in use of Casamance technique as well as training of new cooperative members conducted by experienced members. Ministry representatives (RDESD and RDIT) will also undertake compliance monitoring regarding to the application of national laws and regulations.

Concerning the monitoring of results (outputs and outcomes), MBG and MAZAVA will be responsible for monitoring all indicators, such as abundance of aquatic birds, fish, density of Lepironia mucronata (sedge) etc, in a manner that aligns to the stated milestones. For safeguarding application, the site-bases safeguarding focal point will carry out quarterly monitoring to track the application of the process and to collect feedback or complaints from the beneficiary communities following the grievance mechanism.

All data collected will be centralized at MBG's Monitoring-Evaluation Officer at regional office who will subsequently process, analyze and interpret the results. Every two months, a coordination meeting will be organized between the partners during which the results will be presented, debated to inform the progress and to take measures for adaptive management. During this time, partners will also be able to raise non-compliance with regard to the application of law and regulations and the safeguarding system.

The success of this project requires that the MAZAVA team has adequate capacity to fulfil their designated roles. In large part this capacity will be built by consultants. Project Director with Project Manager, will evaluate MAZAVA's capability with reference to performance in providing the expected results. After each evaluation, additional work required to build capacity will be defined..

At the end of each semester, a workshop will be organised for all partners along with local and regional stakeholders (Governor, Mayors, Presidents of Fokontany and representatives of beneficiaries) to track the progress (usually in terms of quantifiable results) and discussions will be animated to develop shared recommendations to improvement interventions.

External technical and financial evaluations are planned in which all partners will collaborate with the evaluators and the fund administrator to provide the necessary information. Two types of evaluation are planned: 1) mid-term evaluation with schedule dependent on fund administrator's planning. This should be able to inform all stakeholders (and the donor) the progress and give truly independent feedback especially concerning potential failure to deliver; 2) final evaluation, schedule depending on fund administrator. This should capitalize on good practices and lessons learned, essential information for the sustainability of results as well as guiding potential extension of the model to broader scale.

Total project budget for M&E (£)	
(this may include Staff and Travel and Subsistence Costs)	
Total project budget for M&E (%)	
(this may include Staff and Travel and Subsistence Costs)	
Number of days planned for M&E	

Section 10 - Logical Framework & Standard Indicators

Q25a. Logical Framework (logframe)

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

 [bcf-st2-and-single-stage-logical-framework-MBG DIR 31S11181](#)
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Impact:

Impact: Along Madagascar's east coast invasive alien trees are controlled, the use of native trees for charcoal production is reduced and benefits for rural Malagasy people are diversified and improved.

Outcome:

In a model application on Pointe-a-Larrée Peninsula invasive alien trees are controlled, use of native trees for charcoal ceases, natural ecosystems are reconstituted and local livelihoods are improved.

Project Outputs

Output 1:

Melaleuca population controlled in the Pointe à Larrée peninsula, leading to an expansion of more natural habitats (lakes and marshes for Lipironia sedge) as well as plantations of quick-growing, non-invasive species.

Output 2:

Casamance Kiln technique adopted by charcoal producers providing sustained and lucrative production of green Melaleuca charcoal and wood vinegar

Output 3:

Biochemical properties of the pyroligneous liquid specifically from Melaleuca wood (i.e. Melaleuca wood vinegar) are known and data available to show its efficacy in reducing insect damage to crops and as a wood preservative

Output 4:

Green charcoal and wood vinegar appreciated by consumers and product sale strategy supported in a sustainable manner

Output 5:

A business model, based on joint south-south cooperation and learning, disseminated nationally and internationally

Do you require more Output fields?

☒ No

Activities

Each activity is numbered according to the Output that it will contribute towards, for example, 1.1, 1.2, 1.3 are contributing to Output 1.

- 1.1 Developing Memorandum of Understanding (MoU) with partners (5 Institutions, YR1).
- 1.2 Producing five year plan (YR1) and annual plan (Y1 to YR5) for controlling Melaleuca
- 1.3 Issue and renew, annually, permits for removing Melaleuca (YR1 to YR5).
- 1.4 Removal of Melaleuca throughout Pointe -à-Larree peninsula (ca.100Ha/an, Y1 to Y5)
- 1.5 Orient target groups to follow plans developed by technicians (YR1 to YR5)
- 1.6 Conduct cross-training between members of Cooperative to train new members (YR1 to YR5)
- 1.7 Production and planting of non-invasive, fast-growing exotic tree species in the terrestrial areas post-removal of Melaleuca in reforestation zone (100,000 plants/year (ca.60Ha, YR1 to YR5)
- 1.8 Production and planting of native species for the restoration of degraded areas post-removal of Melaleuca in forest

restoration zone (20,000 plants/year (ca.5Ha), YR1 to YR5)

1.9 Daily patrol by Rangers and community-based Associations (COBA) to ensure no cutting of native species for charcoal production (YR1 to YR5)

1.10 Verbalization of offenses by Judicial Police Officers (3 missions/year, YR1 to YR5)

1.11 Effective application of Dina (internal regulation) by the Dina's committee (YR1 to YR5)

1.12 RDESD conducts a quarterly verification of the compliance with Melaleuca exploitation regulations (4 missions/year, YR1 to YR5)

1.13 Conduct quarterly participatory monitoring of biodiversity and progress of activities by partners (4 missions/year, YR1 to YR5)

1.14 Daily observation of bird populations by MAZAVA-NATURE and MBG (YR1, Y3 and YR5)

1.15 Assessment of fish stocks by MAZAVA-NATURE and MBG (twice/year, YR1, YR3, YR5)

1.16 Inventory and density assessment of *Lepironia mucronata* by MAZAVA-NATURE and MBG (once/year, Y1, YR3, YR4, YR5)

1.17 Annual monitoring of population/density of Melaleuca using satellite and drone images over time (YR1 and YR5).

2.1 Village meetings within Pointe-à-Larrée peninsula to inform and sensitize people on interests of collaborating and collecting feedback (at least 10 villages, YR1).

2.2 Charcoal producers expert from Benin (CoForMO team) conduct training for cooperative's charcoal producers for optimal use of Casamance kilns (5 team members from Benin, YR1).

2.3 Local production of Casamance kilns for charcoal producers (total 30 kilns: 6 Casamance kilns/year produced, Y1 to Y5)

2.4 Production of green charcoal and wood vinegar by charcoal producers (from YR1 to TY5)

2.5 MAZAVA-NATURE/MBG follow-up application of training by charcoal producers using Casamance kilns (from YR1 to TY5)

2.6 Publication of project results on social networks, mass media (fb, tweeter, newspaper) (1 publication/month, from YR1 to YR5)

2.7 Annually, organise festival of biodiversity to publicise products and promote public awareness (5 festivals, from YR1 to YR5)

3.1 Analyzing chemical composition and toxicity risk of Melaleuca wood vinegar in reputable laboratories in United Kingdom (UK) and Madagascar to guide future uses (YR1).

3.2 Conduct effectiveness tests of wood vinegar on: construction wood; rice growing; vegetable growing (15 trials of use of wood vinegar for each test versus 15 controls in 3 regions (YR2).

3.3 MAZAVA-NATURE/MBG conducts monitoring of trials in the three regions (YR2).

3.4 Request for authorization to use wood vinegar from the Ministry of Agriculture and Public Health (YR3).

3.5 Registration of wood vinegar ownership at Malagasy Intellectual Property Office (OMAPI) (YR3).

4.1 Monthly verification by RDESD for product inventory reconciliation before issuing sales agreement for green charcoal and wood vinegar (YR1 to YR5)

4.2 Capacity building of staff members of NGO MAZAVA-NATURE about marketing and commercial strategy, communication and the fish sector (3 themes, YR1 and YR2).

4.3 Review of the Cooperative's business plan and commercial strategy taking into account the new product of wood vinegar (YR2)

4.4 Organize a workshop to validate the revised business plan, marketing and commercial strategy (YR2)

4.5 MAZAVA NATURE with RDIT conduct coaching to members of Cooperative on application of business plan, marketing and commercial strategy (YR2)

4.6 Implementation of commercial strategy by members of the Cooperative (from YR2 to YR5)

4.7 RDIT/MAZAVA-NATURE conduct monthly, quarterly monitoring to refine the commercial strategy and business plan (YR2 to YR5)

4.8 Build a commercial center for Melaleuca products in Fenerive-Est with an annex MAZAVA-NATURE's office (YR1)

4.9 Provide means of transport for delivery of products, start-up funds and equipment (1kubota, 1 tricycles, packaging, scales, etc., YR1 and YR2).

4.10 Organise storage, transport and sale of Melaleuca products by Cooperative members (Y1 to YR5)

4.11 Organise visit to demonstration plots by villager representatives for application of wood vinegar on house construction and rice and vegetable growing (50 participants for 1 visit/region, Y3).

- 4.12 Updating bimonthly Project' progress and events on website (30 update sessions, from YR1 to YR5)
- 4.13 All partners and local authorities conduct half-yearly participatory monitoring of the project progress (10 meetings, from Y1 to YR5)
- 5.1 Regional launch to inform stakeholders representatives, decision-makers on project goals (Year1)
- 5.2 Partners attend national and international events (e.g. conferences, economic fairs, ect) to disseminate the achievement and results of the project (2 events/year, YR1 to YR5)
- 5.3 Organize cross-training for sharing and valorizing knowledge on sustainable charcoal production management practices over landscapes in Benin (6 representatives from Madagascar, YR3).
- 5.4 Organize national workshops to share results with decision-makers, conservationists in Madagascar (2 workshops, YR2 and YR5)
- 5.5 Publication of peer-reviewed articles describing the project approach, results and evaluating conditions for wider application to scientific journal (2 publications, YR3 and YR5).

Q25b. Standard Indicators

Standard Indicator Ref & Wording	Project Output or Outcome this links to	Target number by project end	Provide disaggregated targets here
DI-D01b: Area improved through restoration	Output indicator 1.2 and 1.3/Output1	540	215 ha passive/assisted restoration of marsh ecosystem and 325 ha for active restoration of terrestrial ecosystems (25 Ha native species and 300Ha fast growing non-invasive alien tree species)
DI-C02: Number of new conservation or species stock assessments published	Outcome indicator 0.1/outcome	4	two species of aquatic birds and two species of fish (at local level)
DI-D03b: Number of people with improved income	Outcome indicator 0.5/outcome	500	200 charcoal producers (100 men and 100 women: 80 in YR1, 100 in YR2, 150 in YR3 and 200 in YR4 and YR5, as cumulative number), plus 300 women involved in Melaleuca removal (By YR1 130, by YR2 165, by YR3 220, by YR4 260 and by YR5 300 women (as cumulative numbers)
DI-C10: Number of decision-makers attending briefing events	Output indicator 5.1/Output5	100	50 YR2 and 50 YR5 (50% women)
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response

No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response

If you cannot identify three Standard Indicators you can report against, please justify this here.

No Response

Section 11 - Budget and Funding

Q26. Budget

Please complete the appropriate Excel spreadsheet, which provides the Budget for this application and ensure the Summary page is fully completed. Some of the questions earlier and below refer to the information in this spreadsheet.

📎 [BCF Budget over 100k MASTER 25.07.24 MBG P](#)
[AL DIR31S11181](#)
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Q27. Alignment with other funding and activities

This question aims to help us understand how familiar you are with other work in the geographic/thematic area, and how this proposed project will build on or align with this to avoid any risks of duplicating or conflicting activities.

Q27a. Is this new work or does it build on existing/past activities (delivered by anyone and funded through any source)?

☒ Development of existing/past activities

Please provide details:

In Madagascar, no similar project has ever existed. However the current proposal builds on an ongoing project (under DI Round 28 funding) consisting of the control of the invasive species Maleleuca and transforming its wood to improve the income of charcoal producers. The proposed project builds on the knowledge and trusting multi-partner relationships built in the existing project, as well as its promising results: specifically while the ongoing project is controlling Melaleuca only within the Pointe-à-Larrée PA with an increase of 25% increase in income for 100 households, the proposed project will scale-up species control to the entire peninsula with an expected increase in income of 100% for 200 households. This endeavour is unique because it is first time an attempt has been made to control of an invasive plant species at this scale. The methods proposed too are innovative: introduction to Madagascar of the high performing carbonization technique using the Casamance kiln, and resulting from this technique, is the opportunity to collect wood vinegar that elsewhere in Africa has an array of uses yet entirely unknown in Madagascar. This product has the potential to radically improve agricultural production.

Q27b. Are you aware of any current or future plans for work in the geographic/thematic area to the proposed project that may duplicate or cut across this proposed project?

☒ No

Q28. Value for Money

Please demonstrate why your project is good value for money in terms of impact and cost-effectiveness of each pound spend (economy, efficiency, effectiveness and equity). Why is it the best feasible project for the amount of money to be spent?

Ecosystem restoration is recognized as being difficult and expensive compared to pure conservation, especially in developing countries like Madagascar where the technical, politico-economic and social contexts is not always favorable. To maximize efficiency previous experiences and existing human capacity will be capitalized. Many activities will be assigned to locals thereby lowering costs but also increasing their engagement and accessing their knowledge. National consultants will only be accessed only when local capacity is lacking. The ambitious objectives of removing Melaleuca and restoring ecosystem integrity will be done at low cost by working with nature and by mobilising the local community.

Creating a viable rural community business is challenging when poverty and political instability reign. But people are (contrary to normal perceptions) accepting of change and exceptionally motivated once they see proof of lucrative and sustainable performance. Following the capacity building of the current green-charcoal project the communities have already taken ownership of their Cooperative and are excited to go further given the right support. Thus the momentum is already there and with relatively modest investment (mostly to lubricate the value chain) important gains for local people, ecosystem integrity and biodiversity are there to be had.

Pointe à Larrée is dominated by aquatic ecosystems. Thus robust items are required capable of withstanding these humid conditions. The few capital items requested will thus be selected taking into account both price and also quality.

Q29. Capital items

If you plan to purchase capital items with Darwin Initiative 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 Cooperative will be equipped with a kubota (a tiny tractor) to facilitate delivery of charcoal to warehouse, a tricycle to deliver products to consumers in town. Locally made Casamance kilns will be used to produce charcoal and wood vinegar. These items will be provided to beneficiaries to maximize profitability of their activity. Life jackets will be used to secure personnel river and sea transportation. The partners and the beneficiary cooperative will be equipped with motorbikes, digital cameras, GPS and laptops to enable them to effectively carry out their tasks. Finally, we propose to obtain a drone, essential aircraft to analyse spatial coverage of the intervention zone and to evaluate success of Melaleuca removal endeavor. The total items costs less than 10% of the total budget. At the end of the project, the items will be left with the partners to allow them to continue this work.

Section 12 - Safeguarding and Ethics

Q30. Safeguarding

All projects funded under the Biodiversity Challenge Funds must ensure proactive action is taken to promote the welfare and protect all individuals involved in the project (staff, implementing partners, the public and beneficiaries) from harm. In order to provide assurance of this, projects are required to have specific procedures and policies in operation.

Please outline how your project will ensure:

- (a) beneficiaries, the public, implementing partners, and staff are made aware of your safeguarding commitment and how they can confidentially raise a concern,**
- (b) safeguarding issues are investigated, recorded and what disciplinary procedures are in place when allegations and complaints are upheld,**
- (c) you will ensure project partners also meet these standards and policies.**

Indicate which minimum standard protocol your project follows and how you meet those minimum standards, i.e. CAPSEAH, CHS, IASC MOS-PSEA. If your approach is currently limited or in the early stages of development, please clearly set out your plans to address this.

MBG's, Madagascar Research and Conservation Program recently developed its own national safeguarding Policy. This took into account the minimum standard protocols (CAPSEAH, CHS, IASC MOS-PSEA) and is applicable not only to MBG employees, but to all partners who sign a partnership contract with MBG. MBG is committed to zero tolerance for harassment and bullying, sexual exploitation and abuse and exploitation of project beneficiaries, particularly vulnerable people. A national focal point was appointed to ensure the effective application. The site-based focal point has been designated, Mr Angelos Stilla Tianarifidy.

Implementation process includes:

- 1) Informing staff, partners and communities of the concept of safeguarding and application of the policy
- 2) Creation of grievance management committee in each Fokontany (smallest administrative unit) by defining common pledge and voting for committee members
- 3) Installing tools for grievance collection, depending on stakeholders (e.g. grievance boxes, notebooks, hotline...)
- 4) receiving, investigating, analyzing, handling grievances by committee members and giving feedback to victim and taking appropriate measures to offender
- 5) If committee can not take decision on a particular case, it may be referred to higher authorities (MBG level, local or regional authorities).
- 6) Conducting regular monitoring and evaluation (planned quarterly).

This process will be maintained and strengthened as part of the current proposal.

In term of safety policy, the major risk identified concerns canoe or motorboat travels crossing rivers and the sea.

Mitigation measure have been proposed in Q21. Risk Management. MBG's Madagascar has this work document in French version (attached) and applied to all staff. If required, we are happy to send later English official version.

Defra recommend you appoint a safeguarding focal point to ensure the project's PSEAH work is taken forward. This can be a separate member of staff or a current member of staff who spends a proportionate amount of time for safeguarding and PSEAH activities. Please name this individual here - this person should also be included in your overall staff list at Q33 and in your budget.

[REDACTED]

Q31. Ethics

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

This project will fully respect DI's principles. Our actions will comply with social norms including all commitments of Core Humanitarian Standard (CHS) and will respect the malagasy laws and regulations in force. At the community level, Federation Lovasoa and Cooperative, as direct beneficiaries, will interface with local communities and all planned actions will be discussed and validated by members as well as the wider community. Adhesion in the project is voluntary and based on informed consent. All personnel must respect local traditions and customs.

During official project' launch, representatives from regional and local authorities and traditional leaders will be invited, and during this event the project will be explained and participants encouraged to express their concerns which will be recorded and addressed. Afterwards, village meetings will be scheduled during which the communities will be invited to share their points of view. Although Melaleuca is an exotic species, and in some contexts problematic, it is a shared resource and the consent of the population for the exploitation and control should be sought. If there are groups, such as land owners, that oppose the use and control of this species for any reason then a discussion will be initiated and compromises sought.

Section 13 - British Embassy or High Commission Engagement

Q32. British embassy or high commission engagement

It is important for UK Government representatives to understand if UK funding might be spent in the project country/ies.

Please indicate if you have contacted the relevant British embassy or high commission to discuss the project and attach details of any advice you have received from them. Please note that some embassies or high commissions may not be able to respond to you but your project will not be penalised for a lack of response.

☒ Yes

Please attach evidence of request or advice if received.

-  [evidence request to British embassy](#)
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Section 14 - Project Staff

Q33. 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.

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?
Adolphe Lehavana	Project Leader	80	Checked
Chris Birkinshaw	Technical adviser	10	Checked
Jeannie Raharimampionona	National partner relationship officer	10	Checked
Descombes Ianosca	Project manager and SIG specialist	100	Checked

Do you require more fields?

- ☒ Yes

Name (First name, Surname)	Role	% time on project	1 page CV or job description attached?
Angelos Stilla Tianarifidy	Head Forest Policing and site-based safeguarding focal point	100	Checked
Rafara Avotriaina Andriamandimbisoa	Monitoring and Evaluation officer	100	Checked
Andrianirina Andotiana Fitahiana	Botanical Research Manager	100	Checked
Guy Rakotondrazandry	Administrative and Finance officer	90	Checked
Albine Theresine RABODOHARIVOLA	Accountant	100	Checked
Delphin RASOLONJATOVO	Wildlife manager	30	Checked
To be recruited	Development officer*	100	Unchecked
To be recruited	Communication officer*	100	Unchecked

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

 [CV-for all staff DIR31S11181](#)

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 pdf 660.82 KB

Have you attached all project staff CVs?

☒ No

If you cannot provide a CV or job description, please explain why not.

*These persons will be recruited at the start of the project.

Section 15 - Project Partners

Q34. Project Partners

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

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 order of the letters must be the same as the order they are presented in below.

Lead Organisation name:	Missouri Botanical Garden, Madagascar Research and Conservation Program (MBG)
Website address:	https://mobot.mg/conservation/ https://www.missouribotanicalgarden.org/
Why is this organisation the Lead Organisation, and what value to they bring to the project? (including roles, responsibilities and capabilities and capacity):	Missouri Botanical Garden has managed Pointe-à-Larrée Forest since 2008 in collaboration with local and regional partners. We have a regional office in Fenerive-Est, capital of the region where there are facilities (bank, internet communication, etc.). Initially, financial operations were assured by the national office in Antananarivo, but since 2021, the regional staff has been reinforced, then increasingly autonomous in administration. In this project, MBG directs the planning of activities, coordinates the implementation (including specific activities for MBG), leads the semi-annual participatory monitoring, distributes resources to partners, oversees financial management respecting Darwin Initiative's procedures and requirements and those of the MBG, controls expenditure and delivers technical and financial reports. MBG also ensures the recruitment of all consultants and supervises their interventions and evaluates impact of training on capacity building for partners. MBG also manages the budgets allocated to beneficiaries such as the Cooperative and the communities for purchasing materials and equipment as well as all operating costs. Since 2004, Adolphe Lehavana, Project Director, has acquired long professional experience as a grant manager within MBG. He will be accompanied by the regional staff and by two national advisers for the technical and administrative tasks.
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 the Lead Organisation? ☒ Yes

Do you have partners involved in the Project?

☒ Yes

1. Partner Name: Regional Direction of Environment and Sustainable Development (RDESD)

Website address: <https://www.environnement.mg/>

What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):

Regional Direction of Environment and Sustainable Development is the regional representative of the Ministry in charge of management of Protected Areas in Madagascar, including the Pointe à Larrée Protected Area. The Director plays a crucial role in implementing the national forestry and environment policies at regional level. Since 2008, MBG has established a convention with RDESD with tacit renewals every two years for managing this PA. In this project, RDESD is mainly involved in monitoring compliance with national legislation and policies, providing technical support in reforestation and restoration , ensures monthly, quarterly monitoring or activities and half-yearly monitoring or results, validates operations and issues permits for raw material exploitation to make green charcoal and wood vinegar. In the case of offenses in PA (e.g illegal cutting of native species), RDESD ensures the verbalization and brings offenders in court. The service will be represented by José Christian RAHENDRIMANANA, Agronomy and Forestry engineer as focal point. Since 2015, he has been Forestry Control Manager and from 2019 upwards, his responsibility has been extended as Chief Regional Service of Forestry, including forest restoration, monitoring, reporting of offenses and the issuance of logging permits (such as valorisation of Melaleuca for ongoing project).

International/In-country Partner: ☒ In-country

Allocated budget:



Representation on the Project Board (or other management structure): ☒ Yes

Have you included a Letter of Support from this partner? ☒ Yes

2. Partner Name: Regional Direction of Industry and Trade (RDIT)

Website address: www.micc.gov.mg

What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):

The Regional Direction of Industry Trade (RDIT), represents the Ministry of Industry, Trade and Consumption in Analanjirofo Region. RDIT facilitates the emergence of development incentives including entrepreneurship, trade and catalyzes the consumption of new products. In this project, RDIT ensures the direct coaching of the Cooperative in the application of marketing strategy, collecting wood vinegar samples for biochemical analyses, popularization of Melaleuca products (green charcoal and wood vinegar) through different channels, facilitating the administrative process for selling products, registration of wood vinegar ownership at the Malagasy Intellectual Property Office (OMAPI).

In addition, RDIT conducts monthly and quarterly monitoring of cooperative's capacity then proposes adaptive management. RDIT will participate in semi-annual monitoring to assess project progress, and then in the dissemination of results through exhibits during economic fairs. RDIT will be represented by the Director, Mrs. Adonia Denisse Rajaonarison, Commissioner for Trade and Competition.. During nine years, she has demonstrated efficiency in various development disciplines, such as cooperation with the PROSPERER project and coaching farmer cooperatives in the region. She is currently assuring RDIT's roles and attributions for the current DI project with success

International/In-country Partner: ☒ In-country

Allocated budget:



Representation on the Project Board (or other management structure): ☒ Yes

Have you included a Letter of Support from this partner? ☒ No

If no, please provide details

We had a verbal acceptance by the Director of this department is awaiting approval from the Ministry. She promised that this letter is available in two weeks.

3. Partner Name: MAZAVA-NATURE

Website address: www.mazava-nature.mg

What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):

MAZAVA-NATURE is a new NGO, recently created in the Region with the mission: "Conservation of nature and improvement of local population livelihoods". In this project, MAZAVA-NATURE will provide coaching for the beneficiary Cooperative, particularly in group management, sales organization, application of procedures, application of business plan, provision of technical supervision of the communities grouped within the Federation Lovasoa for reforestation and forest restoration, monitoring the use of Casamance technique by the Cooperative, monitoring the trials of wood vinegar, and monitoring the impact of the project on key species of fauna and flora. The NGO has members experienced in the environment, inventory of birds, micromammals, and plants, spatial engineering including the use of drones and analysis of satellite images. The NGO will be represented by the focal point Dr Delphin Rasolonjatovo. Delphin is a dynamic young person, recently awarded for his Ph.D qualification zoology (birds) and is already supervising many post graduate students. He acquired solid experience with the NGO Peregrine Fund Madagascar and working for several years as an Environmental Consultant. He will work part-time in this project but will be supported by members specialized in other disciplines to accomplish all tasks assigned to the NGO.

International/In-country Partner: ☒ In-country

Allocated budget:

Representation on the Project Board (or other management structure) ☒ Yes

Have you included a Letter of Support from this partner? ☒ Yes

4. Partner Name: Communauté Forestière du Moyen-Ouémé (CoForMo)

Website address: www.coformo.org

What value does this Partner bring to the project? (including roles, responsibilities and capabilities and capacity):

The Middle Ouémé Forest Community (CoForMO) is an intercommunity of nine (09) municipalities in Benin with the objective of sustainable management of forests in the protected domain of the State, for the benefit of a population of 1,684,530 inhabitants. Created in 2007, then became a Public Intercommunal Cooperation Establishment (EPCI) in 2015, it has developed an innovative forest management strategy over approximately 330,000 ha of forests, with the introduction of the Casamance kiln to improve carbonization techniques in intervention zone. In this project, CoForMo will provide training on the promotion of the Casamance kiln for the benefit of charcoal producers, and experiences sharing with Malagasy partners on sustainable management practices of forest landscapes. The operational team has developed solid skills in this area in Benin, and is prepared to ensure their transfer to Madagascar by a team of qualified technicians and experienced charcoal producers. It will be represented by the Director Mesmin AGBOTON-GEO, a specialist in sustainable development and management of natural resources, who led the entire innovative experience of CoForMO in Benin.

International/In-country Partner: ☒ International

Allocated budget:

**Representation on the Project Board
(or other management structure):**

☒ Yes

**Have you included a Letter of Support
from this partner?**

☒ Yes

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:

☐ International
☐ In-country

Allocated budget:

No Response

**Representation on the Project Board (or
other management structure):**

☐ Yes
☐ No

**Have you included a Letter of Support
from this partner?**

☐ 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:

☐ International
☐ In-country

Allocated budget:

No Response

**Representation on the Project Board (or
other management structure):**

☐ Yes
☐ No

**Have you included a Letter of Support
from this partner?**

☐ 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 combined PDF of all letters of support.

 [Letter of support for all partners and beneficiaries](#)
[DIR31S11181](#)
 02/12/2024
 11:47:36
 pdf 2.54 MB

Section 16 - Lead Partner Capability and Capacity

Q35. Lead Organisation Capability and Capacity

Has your organisation been awarded Biodiversity Challenge Funds (Darwin Initiative, Darwin Plus or Illegal Wildlife Trade Challenge Fund) 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
30-013	Dr. Chris Birkinshaw	Better livelihoods for shifting-cultivators from conserving and restoring Malagasy forests
29-030	Dr Adolphe Lehavana	Controlling invasive alien trees to support conservation and improve livelihoods
29-015	Dr. Chris Birkinshaw	Valorising Malagasy protected areas as seed sources for forest restoration
No Response	No Response	No Response
No Response	No Response	No Response
No Response	No Response	No Response

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

☒ Yes

Section 17 - Certification

Certification

If this section is incomplete the entire application will be rejected.

Please note if you do not upload the relevant materials below your application may be made ineligible.

On behalf of the

Trustees

of

Missouri Botanical Garden, Madagascar Research and Conservation Program

I apply for a grant of

£584,364.00

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

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

- I have enclosed CVs for key project personnel, cover letter, letters of support, a budget, logframe, Safeguarding and associated policies, and project workplan.
- Our last two sets of signed audited/independently verified accounts and annual report (covering three years) are also enclosed.

Checked

Name	Adolphe LEHAVANA
Position in the organisation	Pointe à Larrée PA Manager
Signature (please upload e-signature)	 signature-Adolphe  02/12/2024  14:42:27  png 143.26 KB
Date	02 December 2024

Please attach the requested signed audited/independently examined accounts.

 FINAL-Missouri Botanical Garden-2023 Cons-Audit  02/12/2024  14:43:53  pdf 578.82 KB	 2022 Cons Audit  02/12/2024  14:43:32  pdf 618.32 KB
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Please upload the Lead Partner's Safeguarding Policy, Whistleblowing Policy and Code of Conduct as a PDF. Optionally you can also upload your Health, Safety and/or Security policy or Security Plan here.

 MBG Madagascar's HSE  02/12/2024  16:27:06  pdf 329.52 KB	 MBG SAFEGUARDING POLICY August 2023 EN  02/12/2024  14:44:47  pdf 5.62 MB
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Section 18 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance, including the “Darwin Initiative Guidance”, “Monitoring Evaluation and Learning Guidance”, “Standard Indicator Guidance”, “Risk Guidance”, and “Finance 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 the 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 the below documents to my application: • a cover letter from the Lead Organisation	Checked
• a completed logframe as a PDF using the template provided and using "Monitoring Evaluation and Learning Guidance" and "Standard Indicator Guidance".	Checked
• a budget (which meets the requirements above) using the template provided.	Checked
• a signed copy of the last 2 annual report and accounts (covering three years) for the Lead Organisation, or provided an explanation if not.	Checked
• a completed workplan as a PDF using the template provided.	Checked
• a copy of the Lead Organisation's Safeguarding Policy, Whistleblowing Policy and Code of Conduct (Question 30).	Checked
• a copy of the Lead Organisation's Health, Safety and/or Security policy or Security Plan (Question 30)	Unchecked
• 1 page CV or job description for all the Project Staff identified at Question 33, including the Project Leader, or provided an explanation of why not, combined into a single PDF.	Checked
• a letter of support from the Lead Organisation and partner(s) identified at Question 34, or an explanation of why not, as a single PDF.	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
The additional supporting evidence is in line with the requested evidence, amounts to a maximum of 5 sides of A4, and is combined as a single PDF.	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 checked the Darwin Initiative website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on the Darwin Initiative website.	Checked

We would like to keep in touch!

Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under the Biodiversity Challenge Funds. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share our regular 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 organisation, project leader, location, and total grant value).

Project Title: **Developing a model for lucrative, productive and green charcoal production**

Project Summary	SMART Indicators (including disaggregated targets)	Means of Verification	Important Assumptions
Impact: Along Madagascar's east coast invasive alien trees are controlled, the use of native trees for charcoal production is reduced and benefits for rural Malagasy people are diversified and improved.			
Outcome: In a model application on Pointe-a-Larrée Peninsula invasive alien trees are controlled, use of native trees for charcoal ceases, natural ecosystems are reconstituted and local livelihoods are improved.	0.1 By YR5, abundances of key indicator aquatic species: the birds <i>Anas melleri</i> (EN) and <i>Ardea humbloti</i> (EN), and two presumed new fish species <i>Ptychochromis sp</i> and <i>Paratilapia sp</i>) increase 100% compared to baseline to be collected at the start of the project 0.2 Densities of the key native sedge <i>Lepironia mucronata</i> in marshes freed from <i>Melaleuca</i> , increase 20%, 40%, 50% respectively YR3, YR4, YR5, compared to control plots 0.3 By YR5, 80% reduction in the quantity of wood poles of native species used for construction of houses collected in the sustainable use zones of PA (with 13,591 stems exploited in this zone in 2023 (YR0) MBG's database, 2023) 0.4 25% increase in rice and vegetable crop yield for 30 trial plots in Year 2 (maintained over remainder of project) due to the use of wood vinegar compared to control plots 0.5 Income for charcoal producers increases 100% for 80 charcoal producers using <i>Melaleuca</i> products YR1, 100 in YR2,	0.1 Systematic daily observations during one week per month of avian communities and stock assessment twice a year for <i>Ptychochromis sp</i> and <i>Paratilapia sp</i> in lakes and rivers within the Pointe à Larrée Peninsula in YR1, YR3, and YR5 0.2 Inventory using plots and counting of <i>Lipironia</i> stems in representative sample plots of cleaned areas compared to reference plots 0.3 Collection of data on the annual quantity of wood used for construction by households with legal permits delivered by Associations managing forest plots in the buffer zones 0.4 Monitoring of agricultural plots using wood vinegar in comparison of the yield	If <i>Melaleuca</i> populations are controlled then natural marsh ecosystems can naturally regenerate and thereby improve ecosystem services. Individuals of threatened species of fauna can return and reproduce as the natural ecosystems regenerate. The use of wood vinegar is as effective as claimed in several countries for protecting timber against insect attack, thereby increasing significantly the lifespan of timber (currently average of 5 year life span for traditional houses) The use of wood vinegar is as effective as claimed in several countries as a natural pesticide to protecting crops against insect attack thereby increasing agricultural productivity The Casamance Kiln technique will double the yield of charcoal compared to the traditional technique and, once associated

Project Title: **Developing a model for lucrative, productive and green charcoal production**

	150 in YR3, 200 in YR4 and YR5 (as cumulative numbers and at least 50% women, with base-line £323.8/year/household)	obtained from comparable control plots. 0.5 Analysis of data from delivery records per person at the cooperative's <i>Melaleuca</i> charcoal production sites	with the sale of wood vinegar, (supposedly more valuable than charcoal), the total income will be doubled or tripled.
Output: 1. <i>Melaleuca</i> population controlled in the Pointe à Larrée peninsula, leading to an expansion of more natural habitats (lakes and marshes for <i>Lipironia</i> sedge) as well as plantations of quick-growing, non-invasive species.	1.1 By YR5, lake surface remains stable (no areas newly invaded by <i>Meleleuca</i>, with baseline 688.5 Ha) 1.2 By YR5, an additional area of 215 Ha of <i>Lepironia</i> marsh has established in areas where <i>Melaleuca</i> has been controlled (baseline of <i>Lepironia</i> marsh = 1989 Ha, thus at the end of the project we anticipate 2204 Ha of <i>Lepironia</i> sedge marsh on the Pointe a Larree peninsula) 1.3 Annually (from YR1 to YR5), 65 Ha of land area reforested (with fast-growing but non-invasive alien tree species including native species), with a total of 477Ha, with 152 Ha as a base line in YR0 1.4 By YR1 130, by YR2 165, by YR3 220, by YR4 260 and by YR5 300 women (as cumulative numbers) involved in the control of <i>Melaleuca</i>, with baseline of 114 women (MBG's database, June 2024)	1.1 Analysis of land occupation types using satellite and drone images over time 1.2 Analysis of land occupation types using satellite and drone images to identify new marshes established on areas once infested by <i>Melaleuca</i>. 0.3 Analysis of land occupation types using satellite and drone images annually to identify areas where <i>Melaleuca</i> has been controlled and where reforestation with non-invasive trees has been launched. 1.4 Quarterly compilation and analysis of attendance records	Manual uprooting of <i>Melaleuca</i> plants, followed by repeated removal of young plants and recolonization of plots by planting non-invasive, fast-growing species will lead to control of the <i>Melaleuca</i> population. Population control of <i>Melaleuca</i> in marshes and adjacent terrestrial areas prevents the colonization and the recolonization of the species into lakes, enhancing the integrity of ecosystems as whole within the Pointe à Larrée landscape
Output 2. Casamance Kiln technique adopted by	2.1. Annually, 2,000 people as potential producers are informed and sensitized on the interest of joining Cooperative to	2.1 Estimation of number of people targeted attending events and listening to	With the trust built during the current project in which charcoal producers learnt how to prepare

Project Title: **Developing a model for lucrative, productive and green charcoal production**

charcoal producers providing sustained and lucrative production of green <i>Melaleuca</i> charcoal and wood vinegar	produce <i>Melaleuca</i> products through various communication channels (social networks, mass media, festivals, villager meetings etc) 2.2. Casamance kilns used by 50% (40 members of charcoal producers cooperative) in YR1 (6 Casamance kilns), by 100% (100,150, 200,200 members for Y2, YR3, YR4 and YR5 respectively (6 Casamance kilns additional per year: total 30 Casamance kilns provide from YR1 to YR5) (only 01 Casamance kiln as a test for baseline in YR0 against 100% technique MATI in YR0). 2.3. By YR1 60 of green charcoal produced by YR2 80t, by YR3 110t, by YR4 130t and by YR5 180t with baseline of 30 tons in YR0 2.4. By YR1 1000 liters of wood vinegar produced, by YR2 1333 liters, by YR3 1833 liters, by YR4 2166 liters and YR 3000 liters, (with 100liters as baseline in YR0)	various types of communication channels 2.2 Notebook records the frequency of use of Casamance kiln against traditional MATI technique 2.3 Analysis of data captured in record books of charcoal deliveries by the Cooperative's producers 2.4 Analysis of data on wood vinegar sales captured in the Cooperative's sales book.	<i>Melaleuca</i> wood for conversion to charcoal, the producers are willing to invest their time in further innovations, namely the Casamance Kiln carbonization technique and products wood vinegar. The low level of education often leads to reluctance to use new techniques like Casamance kiln or new products like wood vinegar, but communication strategies with good formulation of key messages, reinforced by exchanges of observations and demonstration plots can change attitudes. Casamance carbonization provides double the yield of charcoal compared to traditional techniques and plantations of non-invasive, fast-growing species can serve sustainably as raw material once the <i>Melaleuca</i> population in the Pointe à Larrée Peninsula has been controlled. By correctly applying Casamance carbonization, we will collect at least 1 liter of wood vinegar per 100 kg of green charcoal produced.
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Project Title: **Developing a model for lucrative, productive and green charcoal production**

Output3. Biochemical properties of the pyroligneous liquid specifically from <i>Melaleuca</i> wood (i.e. <i>Melaleuca wood vinegar</i>) are known and data available to show its efficacy in reducing insect damage to crops and as a wood preservative	3.1 By YR1 biochemical composition and risk of toxicity of <i>Melaleuca</i>-based wood vinegar known (unknown YR0) 3.2 By YR2 45 tests of value of wood vinegar carried out including 15 for construction wood, 15 for rice growing and 15 for vegetable growing at three contrasting study sites (zero knowledge of <i>Melaleuca</i>-wood vinegar in YR0)	3.1 Results of wood vinegar analysis from reputable laboratory 3.2 Results of trial data	Chemical composition of wood vinegar differs from one species to another but generally this product contains acetic acids, ketones, esters, aldehydes, phenols that give this product the virtue of a pesticide and even, apparently, a natural organic fertilizer. We assume that wood vinegar made from <i>Melaleuca</i> wood will share these virtues but confirmatory tests are required.
Output4. Green charcoal and wood vinegar appreciated by consumers and product sale strategy supported in a sustainable manner	4.1. In YR1 sales strategy available and applicable 4.2 Annually from YR2 to YR5, 100% of the charcoal and wood vinegar produced by the cooperative are accessible and consumed by consumers 4.3 By YR3, at least five staff members of the NGO MAZAVA NATURE have improved skills and specialized (project management, marketing and commercialization, effective communication, fish inventory) able to provide adequately coaching to Cooperative 4.4. Annually, 20,000 potential buyers of <i>Melaleuca</i> products (green charcoal consumers, rice and vegetable growers) are informed and sensitized on the interest of using <i>Melaleuca</i> products through various communication channels (regional and national events, social networks, festivals, mass media, village meetings, visit to demonstration plots)	4.1 Up-to-date sales strategy available at all times. 4.2 Analysis of records of deliveries by producers and the sales log by the cooperative 4.3 Technical reports, minutes of training, tests of knowledge and skills retained from training. 4.4 Estimation of number of people targeted attending events and listening various types of communication channels 4.5 Report, photos and official hand-over of the building and equipment	Our perceptions are correct that the green charcoal, that has been sold since 2023, is appreciated by clients are correct and they will continue to use this product. Chemical pesticides present risks to human health and the environment, are very expensive and difficult to access by farmers in rural areas with low annual income, thus, when wood vinegar becomes available. then this will constitute a cheaper, effective and more easily accessible alternative that is also less damaging to the environment. The business plan, which must define a marketing strategy adapted to the current context, developed under the supervision of a consultant and implemented

Project Title: **Developing a model for lucrative, productive and green charcoal production**

	4.5 By YR1 and YR2, sales infrastructure are improved and adequate in main town (Fénérive-Est) (zero as baseline).		through coaching of NGO MAZAVA NATURE, will make it possible to expand the market reach of <i>Melaleuca</i> products at least to the level of the Region.
Output5: A business model, based on joint south-south cooperation and learning, disseminated nationally and internationally	5.1 By YR2 and YR5, 100 persons, national and international with specific functions including at least 50% women (Representatives of national decision-makers, conservationists, scientists) participate in a workshops organized to share the business model of the Cooperative and cross-training in Benin so that our insights can contribute to National and international sustainable development policies 5.2 YR3 and YR5, two articles describing the successes and lessons to be learnt from the project model will be published in a peer reviewed business journal and one article in a scientific journal including biochemical composition of <i>Melaleuca</i> wood vinegar and an objective evaluation for various uses.	5.1 Workshop minutes, attendance sheets, and analysis of “feedback” forms 5.2 Copies of publications.	This project contributes to the implementation of several conventions ratified by Madagascar and thus decision-makers are likely to use it as a model and integrate it into the government's development policy.
Activities 1.1 Developing Memorandum of Understanding (MoU) with partners (5 Institutions, YR1). 1.2 Producing five year plan (YR1) and annual plan (Y1 to YR5) for controlling <i>Melaleuca</i> 1.3 Issue and renew, annually, permits for removing <i>Melaleuca</i> (YR1 to YR5). 1.4 Removal of <i>Melaleuca</i> throughout Pointe -à-Larree peninsula (ca.100Ha/an, Y1 to Y5) 1.5 Orient target groups to follow plans developed by technicians (YR1 to YR5) 1.6 Conduct cross-training between members of Cooperative to train new members (YR1 to YR5) 1.7 Production and planting of non-invasive, fast-growing exotic tree species in the terrestrial areas post-removal of <i>Melaleuca</i> in reforestation zone (100,000 plants/year (ca.60Ha, YR1 to YR5) 1.8 Production and planting of native species for the restoration of degraded areas post-removal of <i>Melaleuca</i> in forest restoration zone (20,000 plants/year (ca.5Ha), YR1 to YR5)			

Project Title: Developing a model for lucrative, productive and green charcoal production

- 1.9 Daily patrol by Rangers and community-based Associations (COBA) to ensure no cutting of native species for charcoal production (YR1 to YR5)
- 1.10 Verbalization of offenses by Judicial Police Officers (3 missions/year, YR1 to YR5)
- 1.11 Effective application of Dina (internal regulation) by the Dina's committee (YR1 to YR5)
- 1.12 RDESD conducts a quarterly verification of the compliance with Melaleuca exploitation regulations (4 missions/year, YR1 to YR5)
- 1.13 Conduct quarterly participatory monitoring of biodiversity and progress of activities by partners (4 missions/year, YR1 to YR5)
- 1.14 Daily observation of bird populations by MAZAVA-NATURE and MBG (YR1, Y3 and YR5)
- 1.15 Assessment of fish stocks by MAZAVA-NATURE and MBG (twice/year, YR1, YR3, YR5)
- 1.16 Inventory and density assessment of *Lepironia mucronata* by MAZAVA-NATURE and MBG (once/year, Y1, YR3, YR4, YR5)
- 1.17 Annual monitoring of population/density of Melaleuca using satellite and drone images over time (YR1 and YR5).

- 2.1 Village meetings within Pointe-à-Larrée peninsula to inform and sensitize people on interests of collaborating and collecting feedback (at least 10 villages, YR1).
- 2.2 Charcoal producers expert from Benin (CoForMO team) conduct training for cooperative's charcoal producers for optimal use of Casamance kilns (5 team members from Benin, YR1).
- 2.3 Local production of Casamance kilns for charcoal producers (total 30 kilns: 6 Casamance kilns/year produced, Y1 to Y5)
- 2.4 Production of green charcoal and wood vinegar by charcoal producers (from YR1 to TY5)
- 2.5 MAZAVA-NATURE/MBG follow-up application of training by charcoal producers using Casamance kilns (from YR1 to TY5)
- 2.6 Publication of project results on social networks, mass media (fb, tweeter, newspaper) (1 publication/month, from YR1 to YR5)
- 2.7 Annually, organise festival of biodiversity to publicise products and promote public awareness (5 festivals, from YR1 to YR5)

- 3.1 Analyzing chemical composition and toxicity risk of Melaleuca wood vinegar in reputable laboratories in United Kingdom (UK) and Madagascar to guide future uses (YR1).
- 3.2 Conduct effectiveness tests of wood vinegar on: construction wood; rice growing; vegetable growing (15 trials of use of wood vinegar for each test versus 15 controls in 3 regions (YR2).
- 3.3 MAZAVA-NATURE/MBG conducts monitoring of trials in the three regions (YR2).
- 3.4 Request for authorization to use wood vinegar from the Ministry of Agriculture and Public Health (YR3).
- 3.5 Registration of wood vinegar ownership at Malagasy Intellectual Property Office (OMAPI) (YR3).

- 4.1 Monthly verification by RDESD for product inventory reconciliation before issuing sales agreement for green charcoal and wood vinegar (YR1 to YR5)
- 4.2 Capacity building of staff members of NGO MAZAVA-NATURE about marketing and commercial strategy, communication and the fish sector (3 themes, YR1 and YR2).
- 4.3 Review of the Cooperative's business plan and commercial strategy taking into account the new product of wood vinegar (YR2)
- 4.4 Organize a workshop to validate the revised business plan, marketing and commercial strategy (YR2)

Project Title: Developing a model for lucrative, productive and green charcoal production

- 4.5 MAZAVA NATURE with RDIT conduct coaching to members of Cooperative on application of business plan, marketing and commercial strategy (YR2)
- 4.6 Implementation of commercial strategy by members of the Cooperative (from YR2 to YR5)
- 4.7 RDIT/MAZAVA-NATURE conduct monthly, quarterly monitoring to refine the commercial strategy and business plan (YR2 to YR5)
- 4.8 Build a commercial center for Melaleuca products in Fenerive-Est with an annex MAZAVA-NATURE's office (YR1)
- 4.9 Provide means of transport for delivery of products, start-up funds and equipment (1kubota,1 tricycles, packaging, scales, etc., YR1 and YR2).
- 4.10 Organise storage, transport and sale of Melaleuca products by Cooperative members (Y1 to YR5)
- 4.11 Organise visit to demonstration plots by villager representatives for application of wood vinegar on house construction and rice and vegetable growing (50 participants for 1 visit/region, Y3).
- 4.12 Updating bimonthly Project' progress and events on website (30 update sessions, from YR1 to YR5)
- 4.13 All partners and local authorities conduct half-yearly participatory monitoring of the project progress (10 meetings, from Y1 to YR5)

- 5.1 Regional launch to inform stakeholders representatives, decision-makers on project goals (Year1)
- 5.2 Partners attend national and international events (e.g. conferences, economic fairs, ect) to disseminate the achievement and results of the project (2 events/year, YR1 to YR5)
- 5.3 Organize cross-training for sharing and valorizing knowledge on sustainable charcoal production management practices over landscapes in Benin (6 representatives from Madagascar, YR3).
- 5.4 Organize national workshops to share results with decision-makers, conservationists in Madagascar (2 workshops, YR2 and YR5)
- 5.5 Publication of peer-reviewed articles describing the project approach, results and evaluating conditions for wider application to scientific journal (2 publications, YR3 and YR5).