

## Darwin Initiative Main: Annual Report

To be completed with reference to the “Project Reporting Information Note”:  
(<https://www.darwininitiative.org.uk/resources-for-projects/information-notes-learning-notes-briefing-papers-and-reviews/> ).

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes)

**Submission Deadline: 30<sup>th</sup> April 2023**

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### Darwin Initiative Project Information

Project reference	28-025
Project title	Stock-proof hedges to improve farming livelihoods and conserve Malagasy forests
Country/ies	Madagascar
Lead Partner	North of England Zoological Society (Chester Zoo)
Project partner(s)	Missouri Botanical Garden, Madagascar Research and Conservation Program (MBG)
Darwin Initiative grant value	£203,670
Start/end dates of project	Oct 2021 – June 2024
Reporting period (e.g. Apr 2022 – Mar 2023) and number (e.g. Annual Report 1, 2, 3)	March 2022-March 2023
Project Leader name	Dr Claire Raisin
Project website/blog/social media	Twitter: @c_birkinshaw
Report author(s) and date	Fidy Ratovoson, Dr Chris Birkinshaw, Dr Claire Raisin 30 April 2023

## 1. Project summary

The Agnalazaha forest, in SE Madagascar, one of the largest remaining fragments of rare littoral forest, is threatened by cutting trees to make poles by local subsistence farmers who erect fences to protect crops from free-ranging cattle. Cutting these stems degrades the forest, reduces its integrity, and impacts rare native biota. In this project we are supporting farmers by providing training, equipment, and materials (including hedging plants) to plant and manage stock-proof hedges thereby protecting crops, improving livelihoods, and conserving the forest.

## 2. Project stakeholders/ partners

This project is founded on two major partnerships: between Chester Zoo and MBG; and between MBG and the local community living in the peripheral zone of the Agnalazaha Forest Protected Area.

To date Chester Zoo has supported MBG in the implementation of this project by:

- a) facilitating the administrative process – especially guiding MBG staff in honouring the reporting requirements and by providing financial advances,
- b) guiding the development and implementation of monitoring protocols for the evaluation of local perceptions of the project, of the protected area (and its associated management regimes) and of MBG – specifically Greg Counsell (CZ's Social Scientist) spent 7 days on site (11-17 July 2022) to review the implementation of the social monitoring protocols by local staff (Amadou and Elianne) making substantive recommendations for changes to improve their work (Evidence Activity 5.1).
- c) contributing to capacity building of nursery staff – specifically Liz Young (one of CZ's horticulturalists) spent 7 days on site brain-storming with nursery staff on how to improve the quality of plants being produced. Topics of great interest included vegetative propagation and improving the consistency of the compost being used in the nursery (Evidence Activity 2.4).
- d) sensitisation of community members to the principles of hedge laying – specifically Claire Raisin (CZ's Regional Programme Manager ) and Liz demonstrated hedge laying (Evidence Activity 2.10)

The second major partnership essential to the success of this project is that between MBG and various parts of the local community, including: farmers who seek to protect their crops from free-ranging cattle; unmarried mothers who were recruited to work in the nursery; and local middle school students who contributed to monitoring. MBG has been working at Agnalazaha Forest since 2004 and consequently the development of the necessary relationships with these stakeholder groups posed no problems. The recruitment of specific participants in each of these groups (60 farmers, 10 unmarried mothers, and 2 x 10 students (10 working during YR1-YR2, and 10 more during YR2-YR3) was entirely transparent and no problems were encountered in this process. The local authorities and traditional leaders all appreciated this support for community members.

### **3. Project progress**

#### **3.1 Progress in carrying out project Activities**

Output 1. A critical mass (~30%) of agricultural plots within the buffer zone of protected areas are protected effectively from incursion of livestock using barbed wire fences

1.1 *Radio broadcast and village workshops to launch project to local community including solicitation of advice leading to adaptation.* While this activity was completed in YR1, during YR2 Amadou and Elianne developed a close relationship with the project participants and thus, informally, were able to receive and, where appropriate, accommodate their feedback. As an example of this we were informed of the utility of a *Pandanus* species for handicrafts and therefore we orientated the nursery team to collect and propagate seeds of this species for eventual integration into the hedges. Of course the robust spiny leaves of *Pandanus* also make it a good plant for hedging.

1.2 *Workshop to select and orientate farmer participants.* While this activity was completed in YR1, we found that as the project progressed, additional farmers, who had initially been reticent to join the project, came forward requesting inclusion. Thus in YR2 we were able to accommodate the needs of an additional 18 farmers so that in total 60 farmers were implicated in this project is 60 (Evidence Output 2.1). However, our stocks of barbed wire are now almost exhausted.

1.3 *Workshop to train farmers in installation of barbed-wire fences with national expert.* While this activity was completed in YR1, during the course of YR2, 18 farmers belatedly requested to join the project. These farmers were coached by the previous beneficiaries to install the barbed wire fences. One of achievements of this project is that the beneficiary farmers now know how to safely use the “heavy duty cable puller” equipment to tighten the barbed wire during the installation process. The acquisition of this skill is significant because later, once the hedges present an effective barrier, the farmers will likely need to move the barbed wire to erect fences elsewhere. To facilitate this anticipated future work one more cable puller has been purchased.

1.4 *Installation of barbed-wire fences by participating farmers around their plots (4-strand fence for total 16 km; support posts every 2m).* Contrary to the original plan the installation of the barbed wire fences continued into YR2, and we are now pleased to report that, in total, 17 km of barbed wire fences have been installed (see Evidence Output 2.1. and Activity 2.9a and 2.9e).

1.5 *Pre-intervention surveys to establish baseline knowledge and attitudes.* In YR2 the 42 interviews conducted with beneficiaries, the 39 interviews that were conducted with non-beneficiaries and the 10 interviews that were conducted with the nursery women were all transcribed from audio. This work was conducted by a consultant and took 5 months to complete – resulting in 1344 pages of text in Antesaka dialect. These pages of text were then passed to another consultant (a Professor in the English Dept. at Antananarivo University) for translation into English. However, after 3 months of waiting, this consultant admitted that he did not have time to complete this work – and it is indeed a huge amount of work. We are now seeking an alternative person to complete this work. An example of one transcript (in English) is presented as Evidence Activity 5.2.

## Output 2. Agricultural plots of the 35 participating farmers provided with long term protection with livestock- proof hedges

2.1 *Selection of women (unmarried mothers) nursery staff and two seed collectors.* This activity was completed in YR1 and we are pleased to report all those selected continue to work with the project (Evidence Activity 2.1).

2.2 *Installation of tree nursery.* The tree nursery was installed in YR 1. This structure remains in good condition and fully functional (see Evidence Activity 2.2).

2.3 *Installation of crèche associated for young children of nursery staff.* The crèche was installed in YR1 and remains in good condition and fully functional (Evidence Activity 2.3.)

2.4 *Workshop to train nurserywomen in best practice for the propagation of shrubs and trees (provided by horticulturalist from Chester Zoo).* This activity was planned for YR1 but, due to the pandemic, was postponed to YR2, and between 11-17 July 2022, Liz Young, a female horticulturalist from Chester Zoo, travelled to the project nursery to provide training and inspiration to the ten nursery women. Liz covered the fundamentals of best nursery practise (e.g. making compost, breaking seed dormancy, sowing seeds, pricking out seedlings, watering seedlings, control of pests, vegetative propagation (both cuttings and layering techniques), keeping records of results and habituating young plants prior to out-planting; but, in addition, she also brainstormed with the team about how to make the substrate used in the nursery less dense by adding supplements. One of these supplements was home-made cocopeat (Evidence Activity 2.4)).

2.5 *Biweekly presentations on child care for nurserywomen from national experts.* In YR2 ten presentations were organised for the nurserywomen (Activity Evidence 2.5). Other interested women were also invited to participate.

2.6 *Propagation of 16,000 seedlings of plants to be used to enrich hedges.* In YR2 a total of 21,184 young plants of 18 woody plant species were propagated by the nursery women (Activity Evidence 2.6).

2.7 *Purchase and transport of living stakes (= 1 m long stems of plants that root if pushed into the soil).* This activity was carried out in the manner planned and has now been completed. In YR2 total 5,120 *gliricidia* stems were purchased and transported to the target fields (Evidence Activity 2.9)

2.8 *Inserting living stakes along line of barbed wire fence to create basic hedge structure.* This activity was carried out in manner planned and has now been completed. In total 5,120 *gliricidia* stems, 1 m apart, have been inserted along 17 km of barbed wire fence (Evidence Activity 2.9). Moreover, stems that failed to root and died were replaced.

2.9 *Out-planting seedlings of native trees within lines of living stakes (hedge enrichment).* In YR2 10,000 young plants of 14 native trees and shrubs were transported from the nursery and planted along the line of the barbed wire fences (Evidence Activity 2.9). 11,184 young plants remain in the nursery and will be out-planted as they attain an adequate size.

2.10 *Workshop and coaching of farmers to lay hedges (provided by expert hedger from UK).* Unfortunately, due to delays experienced in YR1, the stems of *gliricida* are not yet adequately mature for laying and therefore we did not invite a UK hedge layer to travel to the project site to train local farmers in hedge laying. However, Claire Raisin and Liz Young, who both have some experience in hedge laying, provided staff with a demonstration using a line of young *Acacia mangium* trees that mark the boundary of the MBG compound at Agnalazaha (Evidence 2.10).

Output 3. Capacity of farmers and nursery staff is improved and they have the ability to independently create and maintain stock-proof hedges, or cultivate trees in plant nurseries, respectively.

3.1 *Workshop to train participating farmers in maintenance of their hedges (provided by expert hedger from the UK).* See 2.10.

3.2. *Farmers coached to maintain hedges and evaluated.* Not planned for YR2.

Output 4. A best practice model for protecting forests by developing sustainable crop protection techniques and livelihoods (i.e. use of hedges and enabling access to employment in tree nurseries for young mothers) is developed and shared with other conservation and development organisations operating in Madagascar

4.1. *Communication about project through social media and website.* Eleven posts have been made on twitter (see @c\_birkinshaw) however the earlier ones wrongly acknowledged as “@Darwin\_Defra” rather than “@UKBLFs” (Evidence Activity 4.1)

4.2. *Organisation of study trip to Agnalazaha for representatives for an array of conservation/development NGOs.* Not planned for YR2.

Output 5. Effective project implementation based on adaptive management

5.1. *Workshop to define monitoring protocols and to train monitoring team in their application.* Completed in YR1 but social monitoring protocols refined during the visit by Greg Counsell in July 2022 (Evidence Activity 5.1).

5.2 *Support for monitoring team to apply monitoring protocols.* This activity was carried out in manner and time planned. To date, two batches of middle school students have assisted with monitoring. During YR1 to YR2 we enabled the participation in monitoring of the ten highest performing middle school students who were selected at the end of the second trimester exams (seven young men and three young women) and in March 2023 (at the end of YR2) we recruited another batch of students (7 young men and 3 young women – Evidence 5.2.) enabling the first batch to concentrate on their end of middle school exams. As previously the new batch of students will work on alternate Saturday mornings to monitor various indicators and in return receive a payment and school stationery to help support their future education. During the two years of recruitment, young men out-performed young women in exams and therefore more young men were selected for this work

5.3. *Workshops to share information on project progress, to identify issues arising and to modify interventions to maximise efficacy.* Carried out in manner and time planned – the management team for Agnalazaha Forest PA meet every two weeks to discuss issues arising – Amadou and Elianne are included in these meetings to ensure that this work is well integrated into the overall management of the protected area.

5.4. *Formal reporting:* carried out in manner and time planned

## **3.2 Progress towards project Outputs**

Output 1. A critical mass (~30%) of agricultural plots within the buffer zone of protected areas are protected effectively from incursion of livestock using barbed wire fences.

At the launch of the project no farmers living in the landscape of the Agnalazaha Protected Area protected their crops with barbed-wire fences nor hedges, now, at end of YR 2, 17 km of barbed wire fences have been installed reinforced with *gliricidia* stems and red pineapple are protecting 12.15 ha of fields belonging to 60 farmers. The total area of active fields close to the

forest is ca. 35 ha, so we estimate that 34% of fields in this zone are now protected using barbed wire. Hence this output has been fully achieved.

#### Output 2. Agricultural plots of the 35 participating farmers provided with long term protection with livestock-proof hedges

This Output will not be achieved until end of YR3 of the project. However, currently the progress towards this outcome includes the purchase and planting of *gliricidia* stems, red pineapples, and the production and out-planting of 10,000 young plants of native trees. Moreover, dead stems of *gliricida* and dead young trees have been replaced. In total 17 km of future hedges have been installed.

#### Output 3. Capacity of farmers and nursery staff is improved and they have the ability to independently create and maintain stock-proof hedges, or cultivate trees in plant nurseries, respectively.

The 60 participating farmers now have the skills to safely install a high quality barbed wire fence and ten nursery women are knowledgeable and skilled in horticulture.

#### Output 4. A best practice model for protecting forests by developing sustainable crop protection techniques and livelihoods (i.e. use of hedges and enabling access to employment in tree nurseries for young mothers) is developed and shared with other conservation and development organisations operating in Madagascar

This Output will be achieved towards the end of the Project, to date, our awareness-raising concerning this project has been limited to a few communications on social media. However, a scientific article describing the exploitation of fencing poles at this site and evaluating whether or not this activity is sustainable has been submitted for publication to the journal Madagascar Conservation and Development (see Standard Indicators)

#### Output 5. Effective project implementation based on adaptive management

The project's M&E officer (Elianne Andriamajaja) has continued to ensure the monitoring, evaluation and learning aspects of this project. The data concerning the abundance of diurnal lemurs and large birds was collected with the assistance of high-performing local students. Data from monitoring was reported each month to the Project Director, the Project Manager and to the site-based team (Evidence Output 5).

### **3.3 Progress towards the project Outcome**

The anticipated outcome of this project is that the degradation of Agnalazaha Forest is reversed (with participation and livelihood gains for local men and women) by providing hedges as demonstrably useful, effective, long-term and realistic alternatives for crop protection.

Just two of six indicators of Outcome achievement reference YR2 of the project, these are:

*0.1 In YR2 and YR3 number of tree stems extracted from the forest during the year reduced by 30% compared to baseline (T0).*

In 2021 the number of stems extracted from the Agnalazaha Forest for use a poles was estimated as 77,550 (Evidence Outcome 1). In YR2 we were able to provide barbed wire to all farmers who needed to erect new barriers around their crops and thus the number of stems removed from the forest was near to zero, excepting a small number of stems illegally extracted from the forest for sale to people in more distant Communes where no forest now remains (i.e. not the commune hosting the Agnalazaha Forest).

*0.4 At end of YRs1, 2 and 3 the 35 participating farmers report zero loss of crops to free-ranging cattle from plots included in project and link these gains to tangible livelihood benefits.*

Prior to project implementation (in 2021) a survey of crop loss among participant farmers (N= 44) revealed: 0% = reporting no crop loss; 14% <1/4 crop loss; 11% 1/4 -1/2 crop loss; 17% 1/2 - 3/4 crop loss; 54% nearly total crop loss; and 2% were not able to reply. The same survey at the end of YR2, after the installation of barbed wire revealed: 100% with no crop loss. This is a very significant achievement.

### 3.4 Monitoring of assumptions

*Assumption 1: The provision of alternative methods of protecting crops from livestock will reduce need for fences made from stems extracted from the forest.*

Comments: At the time of writing (strictly YR3) farmers with fields previously made using poles from the forest that now need refencing are once again cutting poles from the forest because we can no longer support the installation of barbed wire fences and because the hedges have yet to prove their efficacy. This exploitation will continue until such a time as the hedges can convince the farmers that they represent a better alternative.

*Assumption 2: Forest and biodiversity not negatively impacted by exceptional events such as wildfires, cyclones, hunting parties. (Mitigation: continuing support for entire program of conservation activities at this site and integration of capacity of adaptation within project design)*

Comments: Fortunately co-funding is available to reduce the risks of fire and hunting. Also, to date, the forest has not been impacted by a really powerful cyclone. In fact, the protected area was impacted by a wild fire during the reporting period (see “area of forest burnt” indicator in Evidence “impact”. This wild fire occurred in a zone where such events are rare and where, consequently, no firebreaks had been installed. Fortunately the local community mobilised to fight the fire and prevent more serious impact.

*Assumption 3: Farmers are receptive to the new techniques shared and that hedges are not damaged/sabotaged by those communities/individuals not involved in this project. (Mitigation: engagement with whole community through comprehensive consultation and communication).*

Comments: To date this assumption is entirely confirmed: the participating farmers are delighted with the barbed wire fences and are fully engaged. However, while the farmers are pleased to participate in planting the young trees along the fence line (which they see as a resource), they have yet to really understand and engage with the concept of hedges.

*Assumption 4: The covid-19 pandemic does not prevent free movement of project participants. (Mitigation: support strong-site based team that can, in the worse-case scenario, be trained virtually by international participants and then play the role of trainers themselves or in some cases, rescheduling activities)*

Comments: In YR2 the pandemic had no impact on the project and the team from CZ were able to complete a visit (for advice and training) to the site that had been postponed from YR1.

*Assumption 5: There are sufficient remnant lemur and bird populations in the nearby higher quality forest to rapidly recolonise the areas where a reduction in exploitation of young trees for fencing stakes enables forest regeneration. (Mitigation: MBG’s program of activities at this site continues to support action to control hunting).*

Comments: While it is premature to confirm this assumption we can report that no incidents of hunting were reported within the Agnalazaha Forest in YR2.

*Assumption 6: Barbed wire not stolen. (Mitigation: engagement with whole community through comprehensive consultation and communication – especially engaging the local traditional leaders to publicly express their support for the project).*

Comments: This assumption is confirmed and there were no incidents of barbed wire theft in YR2.

*Assumption 7: Barbed wire effectively protects the agricultural plots from incursion by livestock. (Mitigation: training and coaching in best practice for the installation and maintenance of fences).*

Comments: Confirmed: 100% of 60 participating farmers who grew crops within barbed wire fences in YR2 reported no loss of crops. Given that, prior to the project, 54% of farmers reported total loss of their crops due to cattle, this result is a very significant achievement.

*Assumption 8: Barbed wire does not cause dismay among livestock owners (i.e. does not injure cattle). (Mitigation: engagement with whole community through comprehensive consultation and communication, openness to receiving feedback and objections).*

Comments: Assumption confirmed - to date we have had no complaints or negative feedback concerning the barbed wire fences.

*Assumption 9: Tree and shrub species that make effective hedges and that survive and grow well under the harsh conditions at this site can be identified and propagated. (Mitigation: from MBG's botanical knowledge at the site create a target list of likely species i.e. that are fast-growing, ideally spiny and regenerate robustly when cut)*

Comments: This assumption can not be confirmed because some of the tree species propagated and out-planted had a high mortality at locations close to the sea. While we appreciated the challenge posed by the poor sandy soils, we neglected to consider the impact of salt-laden winds on young plants. To rectify this error we are propagating a number of more resilient plant species to replace those plants killed by the sea winds. The ideal species to plant in these conditions is *Strychnos* (as was originally proposed) but the use of this plant was rejected by the farmers because its foliage is attractive to cattle and therefore they feared it would draw these animals towards their fields. This characteristic of *Strychnos* is unfortunate because this plant flourishes in degraded habitats and has stems bearing long spines, thus it would have been the ideal hedging plant.

*Assumption 10: At least 30% of local farmers are prepared to invest their time and energy in trialling a new method for protecting their crops. (Mitigation: a budget line has been included to provide participants with food during work associated with the project – so they will not experience extra hardship from participation).*

Comments: This assumption is confirmed: in total 60 farmers participated in this project rather than the 35 initially proposed (Evidence Output 2.1).

*Assumption 11: Despite Agnalazaha being located in a remote part of SE Madagascar and a 2-day drive from the capital, influential people can still be persuaded to invest their time in visiting the site. (Mitigation: investment in good national-level communication during the whole project to make the conservation community aware of the work and to pique their interest).*

Comments: Premature to confirm assumption.

### **3.5 Impact: achievement of positive impact on biodiversity and poverty reduction**

The desired Project impact stated in the original proposal was “The Agnalazaha Forest with its rare fauna and flora is successfully conserved with livelihood gains for the local community”.

The table presented in “Impact” evidence provides a number of conservation indicators for the entire Agnalazaha PA for the period 2020 to 2022. These show that the population of *Eulemur cinereiceps* is stable, that the number of stems cut in the forest is falling, and that the area of forest burnt by wild fires is stable. We have yet to reach-out to share our approaches with the wider conservation community because, until now, our hedges are too immature to be laid. Thus we cannot claim to have had an impact wider than at the intervention site.

While 645 people (42% female) have received compensation for their work to implement this project we cannot claim that these payments will have had a major long term impact on poverty – although certainly this compensation will have helped buffer the community during the annual “lean period”. Perhaps more significant is that the all the farmers benefitting from the installation of barbed wire fences reported no loss of crops compared with 52% who reported that all their crops were lost to grazing cattle prior to the project. This gain, if it can be maintained in the long term, will have a very significant impact on poverty reduction. It is noteworthy that development organisations operating in Madagascar focus on improving crop yield and the complimentary approach of preventing crop loss is neglected.

## **4. Project support to the Conventions, Treaties or Agreements**

### **SDGs**

Goals 1 and 2 (end poverty and hunger) by providing 60 subsistence farming families with more secure barriers that reduce the loss of their crops and reduces their investment in labour for crop protection, by providing new skills and employment to ten nursery staff, and providing

generous day-labouring compensation to 945 local people - often at a particularly difficult times (e.g. prior to harvests when previous harvests have been exhausted)

Goal 4 (lifelong learning opportunities) by upskilling farmers in the installation of barbed wire fences and the use of *gliciridia* and red pineapples to make cow and pig-proof barriers around crops and by training and coaching ten women in horticulture.

Goal 5 (gender equality) by enabling ten females to access employment in a tree nursery that is traditionally a male domain.

Goal 8 (decent work and economic growth) by providing employment for 3 village animators and ten nursery women, and temporary employment for 945 local people. Diversity in economic activities is strongly associated with economic resilience.

Goal 12 (sustainable consumption and production) by reducing environmental degradation of the littoral forest (Evidence Impact) without compromising the economic stability of communities by providing an alternative barrier from the annual use of thousands of stems of native trees as fences (Evidence Output 2.1).

Goals 13 (combat climate change), and 15 (life on land) by initiating a process that will reduce deforestation and degradation of rare littoral forest and installing hedgerows thereby protecting and building carbon sinks and conserving threatened habitats of key biodiversity importance (Evidence Impact).

Goal 17 (partnerships for the goals) by creating a unique partnership of organisations and social groups with complementary skills including farmers in SE Madagascar, a protected area manager in Madagascar (Missouri Botanical Garden), horticulturalists and a social scientist from Chester Zoo.

## **CBD**

This proposed project responds to one of the CBD main goals i.e. 'the conservation of biological diversity' by reducing degradation of a threatened vegetation type (littoral forest) that is the habitat for a very diverse and threatened fauna and flora. Given that the project was launched only in October 2021, it is not possible to demonstrate that this project contributes to this goal. However we have collected baseline information on the condition of the Agnalazaha Forest, and these values will provide the baseline to demonstrate future progress (Evidence Impact).

## **NBSAP**

Ultimately the project will contribute Madagascar's National Biodiversity Strategy and Action Plan by reducing unsustainable harvesting of fencing poles in exceptionally rare littoral forest (thereby enabling its regeneration) and promoting woody vegetation in the landscape in the form of useful and sustainable hedges. In 2021, prior to the project, we estimated that 79,550 poles were collected from the forest for use in fencing while in YR2 no poles were collected by local farmers.

## **UNFCCC**

Ultimately this project will contribute to Madagascar's ambitious Intended Nationally Determined Contribution to the Paris Agreement. But this contribution will not become evident until the end of the project.

## **5. Project support to poverty reduction**

This project is located in SE Madagascar where the majority of people gain meagre livelihoods from unreliable and relatively unproductive subsistence farming and where some of the highest levels of poverty in Madagascar are reported. Farming here is undependable due to the unpredictable weather in which rainfall is seasonally unreliable and floods an almost annual



occurrence. In YR2 the project made a significant contribution to poverty reduction in the following ways:

- Providing total protection of crops grown in the 12.15 ha of fields of 60 participating farmers (compared to total crop lost reported by 52% of farmers prior to the project).
- Providing reliable monthly salaries to 3 village animators and ten nursery women (unmarried mothers) amounting to a total of £4,426.6
- Providing compensation to for 645 different day labourers implementing activities (especially providing fencing posts, transporting seedlings from the nursery to the fields, providing *gliricidia* stems) amounting to £1,810.1
- Providing educational support for a total of 20 high-achieving local students in return for their work in monitoring indicators.

## 6. Gender equality and social inclusion

The 60 farming recipients of the fences/hedges were all male, but those benefitting from the installation of this highly effective barrier will be the entire farming family. Within the protected fields the entire family unit will cultivate crops and be enjoy the results of their labour.

The project provided several opportunities for local people to gain access to compensation from day labour (e.g. for transporting plants) – with a total payment of £1,810.1. These payments were much appreciated, especially at times of especial hardship. Females represented 45% of the these accessing payments.

To address somewhat the gender imbalance described above, the Project continued to compensate ten unmarried mothers as nursery staff (Evidence Activity 2.1). To accommodate this innovation we also maintained a crèche adjacent to the nursery that can provide a safe, cool, comfortable and easily accessible place where the mothers can leave their babies while they work (Evidence Activity 2.3).

Among the 20 middle school students (two promotions each of ten students) engaged to help with monitoring every Saturday morning, only 30% were young women. This is because the choice was made transparently based on marks in the second trimester exams: as it happened, young men did better than young women (Evidence Activity 5.2).

Please quantify the proportion of women on the Project Board <sup>1</sup> .	The Project Board consisted of Claire Raisin (F) and Chris Birkinshaw (M), so it was 50% female.
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women <sup>2</sup> .	<p>CZ: CEO Jamie Christon = M.</p> <p>Senior Directors 3 x M (Simon Dowell, Mike Jordan, Dominic Strange) and 3 x F (Liz Carnie, Charlotte Smith, Kathy Lunn)</p> <p>MBG-Madagascar: Permanent Representative (Christian Camara = M); Coordinator of the Conservation Unit (Jeannie Raharimampionona = F)</p> <p>Local Community: Mayor = M; Chef' Fokontany x 3 = M; Local Kings x 3 = M.</p>

<sup>1</sup> A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

<sup>2</sup> Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

## 7. Monitoring and evaluation

The Project log frame, as submitted as part of the Stage 2 application, lists the indicators for outcomes and outputs. These indicators and the associated methods of verification were the basis of our M&E plan. This plan was developed by the whole team, led by Greg Counsell (from Chester Zoo) and Chris Birkinshaw (from MBG) between October and December 2021, with the production of a written draft of the protocols (as presented as evidence in the YR1 report). As reported previously, the protocols for social monitoring were validated by December 2021 and data collection begun in March 2022. However, in July 2022, Greg Counsell (CZ's social scientist) reviewed this work and suggested some fundamental changes to the protocols, and thus the social data, supposedly referencing the time point T0, was only collected in August of 2022. The new protocols for social monitoring are included in Activity Evidence 5.1, but, in brief, information is collected through a structured conversation with replies being recorded, the audio files are then transcribed into Malagasy (Antesaka dialect) and then this text is translated into English. The English text will be sent to Greg for analysis. While this process represents the very best approach to social survey, it is also time consuming bearing in mind that 91 audio tapes, each 45-60 minutes long have to complete the transcription/translation process (Evidence Activity 5.2). To date all the audio tapes have been transcribed into Antesaka – resulting in 1,344 pages of text!

## 8. Lessons learnt

In general the project is progressing well. In particular we are pleased to report that: a) the nursery women are diligent, motivated and effective in their work; b) the participating farmers have fully embraced the project; and c) the middle school students, with only one or two exceptions, enjoy their work as monitoring assistants and the compensation that they have received has helped them to remain in education. However, there have been three setbacks from which lessons can be learnt:

a) The *gliricidia* cutting and young plants of native trees that were planted along the barbed wire fences of fields close to the sea had high mortality (Evidence X), presumably due to salt-laden winds. We should have anticipated this issue and selected the plant species to be planted at this location based on their tolerance to this condition. To rectify this error we are now propagating young plants of littoral fringe species, such as *Calophyllum inophyllum* and a *Pandanus* species, that will be used to replace the dead plants.

b) The beneficiaries of the fences/hedges were the farmers who needed to install new barriers in 2022 but, recently there were additional farmers who needed to replace their old stake fences for whom we could no longer provide this alternative. Thus they returned to the forest to cut poles. This was not unanticipated and our expectation for the long term is that stock-proof hedges (installed without resort to expensive barbed wire) will provide an attractive alternative.

c) We were anxious that in this project we would apply best practice for monitoring the social impact of our work because, to date, the protocols used in Madagascar to evaluate the social consequences of conservation interventions have been basic and open to criticism. However, best practice, in this case, requires that audio texts of interviews are made that are then transcribed and translated from local dialect into English, before finally being sent to Greg Counsell for analysis. The initial transcription of the T0 interviews has been concluded (after 4 months of work) but we have yet to find someone who can reliably and accurately translate these texts written in Antesaka dialect into English. We thought that we had found the ideal person (an Professor in English at Antananarivo University who grew up close to the Agnalazaha Forest). He accepted to do this work but, after 3 months, due to other obligations, he had only completed the translation of two interviews (out of a total of 91). This delay is unfortunate because we are unable to present social indicators here, but the T0 interviews in dialect are secure and, hopefully soon, they will be translated.

## 9. Actions taken in response to previous reviews (if applicable)

No issues were raised in the review of last year's Annual Report however, two of items of feedback made in the original award letter merit a further response.

- *no reference is made to whether nurseries will sell stock, or if these are affordable beyond the project*

The nursery women have gained significant benefits from their engagement with this project. We are acutely aware that their employment with us will soon draw to a close and consequently David Rajaonarivelo, our Head Nurseryman, has trained them in the production of fruit and spice trees. All the women were interested in this activity and we intend to support this work (by providing access to nursery space, equipment and materials) beyond the end of their contract. We originally thought that the nurserywomen would be attracted to produce young plants of fruit and spice trees for sale but their current motivation is to produce these plants to plant on their family's land.

- *the financial sustainability of fencing/hedging is not clear given that all inputs will be provided free to farmers, and there is no comment on whether farmers have the ability to pay for these items after the project*

Certainly farmers will not buy barbed wire after the end of this project – it is just too expensive. This is a pity because the farmers are delighted at how this material has stopped the loss of crops to cattle. However, since this project will have much increased the presence of *gliricidia* in the landscape, it will be easy and inexpensive for them to make *gliricidia* hedges. Post project, farmers who wish to invest in making *gliricidia* hedges will be able to access seedlings of native trees to enrich these hedges, at no cost, from MBG. Our monitoring of the species-specific survival and growth of seedlings used for making hedges will help us to inform which species are best to use for this work.

## 10. Risk Management

In November 2023 an election should be held in Madagascar to choose the President for a new term. Such elections are often associated with politically-motivated social strife. However, such perturbations are normally restricted to population centres and we do not anticipate repercussions for the implementation of this project in the remote part of Madagascar where Agnalazaha Forest is located.

## 11. Other comments on progress not covered elsewhere

Currently all tree nurseries in Madagascar use black polyethylene pots. These are cheap and effective but their use creates a lot of unattractive non-biodegradable waste. We used the opportunity presented by this project to trial an alternative pot consisting of a stapled tube of the thick, papery bark of the invasive alien tree *Melaleuca quinquenervia*, bunged at the base with a tight coil of the same bark. *M. quinquenervia* is abundant in the littoral marshes around the Agnalazaha Forest, where it is causing desiccation and increasing the susceptibility of this habitat to wild fires. Although pots made of *M. quinquenervia* bark are more expensive than the polyethylene pots, their production provides income for local people and may help control the invasion of this highly invasive species. The utility of these pots depends on whether they remain intact and robust over 12 months in the nursery and also whether the bark of this aromatic plant has any negative effects on the seedlings of other plant species (Evidence Activity 2.6c). Tests are underway to explore these two issues.

## 12. Sustainability and legacy

During YR2 the project was well known and appreciated locally but not known nationally. This is because we have invested but little in sharing our work on a wider scale and will not do so until such a time as the hedges are ready to be laid. We have taken this decision because, although the barbed wire fences have been very effective at stopping loss of crops to cattle, we want to avoid the misunderstanding that this project is about the installation of barbed wire fences – it isn't, and rather these structures were merely the hook to engage farmers in the installation and management of hedges. Only when we can demonstrate that well-managed hedges make an effective stock proof barrier, will we want to share this innovation with the wider conservation and development community in Madagascar. However, herein lies the

problem: on the impoverished sandy soils at Agnalazaha the hedges are growing so slowly that, likely, they will not be able to be laid before the end of the project. To address the problem we propose two actions: a) provide extra care for one length of hedge (i.e. give it fertiliser) so that the hedging plants grow fast and then use this section to demonstrate hedge laying; and b) obtain extra funding for enable an the project to be extended for two years. We are pleased to report that Chester Zoo has committed to providing the necessary support to enable this extension. Beyond this 2-year extension, the legacy of the project is based on the assumption that once local people see that hedges (even without barbed wire fences) make effective barriers, then, provided we can provide the hedging materials, they will be prepared to invest in installing hedges themselves thereby greatly reducing the extraction of fencing poles from the forest.

**13. Darwin Initiative identity**

To date, for the reasons stated above, we have given only modest publicity to the Darwin Initiative:

- Project achievements were posted on a twitter account (11 posts on @c\_birkinshaw in YR2, Evidence 4.1)
- The Darwin Initiative logo has been affixed to significant capital items (computers x 2, motorbike x 1) and used to signpost the DI nursery.
- 60 themed project t-shirts including the DI logo were printed and distributed to project participants (Evidence Activity 4.1)
- The project was given prominence at the annual biodiversity festival (a report for which can be found here XXXX)

Since Madagascar is the beneficiary of an unusual number of Darwin Initiative grants, it has been suggested to the UK Ambassador to Madagascar and the Comores, David Ashley, that perhaps an event could be organised at which all the DI beneficiaries could present their projects to the Malagasy Government, Malagasy Conservation and Development NGOs and other interested parties.

Once the hedges become sufficiently mature to be laid then robust communication will be launched to share this innovation.

**14. Safeguarding**

Has your Safeguarding Policy been updated in the past 12 months?	CZ: Yes (July '22), MBG: No
Have any concerns been investigated in the past 12 months	CZ: Yes, MBG: No No concerns relating to this project have been raised, but within the wider operations of CZ concerns have been raised. One was formally investigated and did not result in any further action, others were noted and reviewed by trained Designated Safeguarding Officers, but did not result in full investigations or formal reports to safeguarding authorities.
Does your project have a Safeguarding focal point?	CZ: Charlotte Smith is safeguarding lead for the whole organisation, however she is not directly involved in this project, therefore any CZ staff working on the project would be empowered to raise any safeguarding concerns they may have with the organisational lead.  MBG: Yes Vola Raharijaona [REDACTED]
Has the focal point attended any formal training in the last 12 months?	MBG: Yes

	As part of a collaboration with RBG Kew (funded by BLF) two formal training sessions were held with their Safeguarding Officer (Ella Remes): one in October 2022 and one in January 2023. In addition monthly meetings to exchange safeguarding issues were also organised.
What proportion (and number) of project staff have received formal training on Safeguarding?	CZ 100% of staff have completed a mandatory eLearning course.  MBG Past: 50% [2] Planned: 100% [4]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.	As reported below, MBG-Madagascar is developing a tailor-made Safeguarding policy and, as part of this process, there have been a number of meetings for staff consultation. These meetings have revealed several areas of conflict between typical “Western” safeguarding provisions and Malagasy cultural norms. For example, in rural Madagascar frequently young people aged 16 live as adults but, under typical safeguarding provisions, such people would be considered as children and not be hired as day labourers. MBG’s Malagasy staff consider that such restrictions on employment would have a negative impact on the lives of these people.
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.	While Chester Zoo leads this project, most of the work is implemented by MBG and, because this work requires interactions with rural Malagasy, most of the safeguarding concerns are related to MBG’s work in the field in Madagascar. To date safeguarding considerations and complaints procedures for the staff of MBG’s Madagascar program have been provided by the Staff Manual, but this Manual was developed for the institutional context of a US organisation functioning in the US. As such, for the Madagascar context, the MBG’s safeguarding framework is not adequately adapted. However, MBG-Madagascar is pleased to report that a consultant has just been hired to develop a tailor-made safe guarding policy and mplementation framework specially for this part of the organisation.

## 15. Project expenditure

**Table 1: Project expenditure during the reporting period (1 April 2022 – 31 March 2023)**

Project spend (indicative) since last Annual Report	2022/23 Grant (£)	2022/23 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				

Capital items (see below)				
Monitoring & Evaluation (M&E)				
Others (see below)				
<b>TOTAL</b>				

**Table 2: Project mobilising of matched funding during the reporting period (1 April 2022 – 31 March 2023)**

	Matched funding secured to date	Total matched funding expected by end of project
Matched funding leveraged by the partners to deliver the project.		
Total additional finance mobilised by new activities building on evidence, best practices and project (£)		

**16. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes**

I agree for the Biodiversity Challenge Funds Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here).

File Type (Image / Video / Graphic)	File Name or File Location	Caption, country and credit	Online accounts to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
Image	Achievements 1 DI YR2 a	Middle school students contributing to monitoring, Agnalazaha Forest, Madagascar. Photo by Elianne RAHARISOA		Yes
Image	Achievements 1 DI YR2 b	Middle school students contributing to monitoring, Agnalazaha Forest, Madagascar. Photo by Elianne RAHARISOA		Yes

Image	Achievements 2 DI YR2 a	Nurserywomen sowing seeds in the DI nursery, Agnalazaha Forest, Madagascar. Photo by Elianne RAHARISOA		Yes
Image	Achievements 3 DI YR2 a	Barbed wire fences – later converted into hedges protect crops from grazing cattle, Agnalazaha Forest, Madagascar. Photo by Elianne RAHARISOA		Yes
				Yes / No

### Outstanding achievement 1.

In Madagascar many conservation and development projects support village tree nurseries. However nursery staff are dominated by men and it is rare to encounter nursery women. This is surprising because, elsewhere in the World, women make superb horticulturalists. To challenge this discrimination, as part of our DI-funded project, we decided to create a tree nursery with an entirely female staff. Moreover to further support the most vulnerable, we recruited a staff entirely composed mothers without partners and built a simple creche nearby so that the nursery staff could bring their young children to work. After 12 months, the ten nursery women have produced 21,184 strong plants of 18 different native trees and shrubs, significantly more than anticipated..

### Outstanding achievement 2.

While there is much positive to be said about life in rural Madagascar, one of the negative aspects of life here is that few families can afford to keep their children at school into the later years of middle school and, at this time, the majority of students drop out. In our DI-Project we have tried to leverage the maximum benefits for local people and one of the ways we are doing this is by supporting the brightest young people in their education who, in return, help us at the weekends for monitoring. We believe this will be a powerful method to promote the development of well-educated future leaders who are also engaged with conservation. To date twenty bright young students have been supported in this manner.

### Outstanding achievement 3.

Development organisations seeking to promote agricultural production typically focus on popularising new cultivation techniques or the installation of infrastructure (such as dams and associated irrigation canals and granaries). These interventions can be valuable but may also fail because impoverished farmers cannot take the risk of trying new (and to them unproven) agricultural techniques and because, post project, the provided infrastructure is not maintained. In this project we have shown that protecting crops from the depredations of grazing cattle (using barbed wire fences and hedges) can have an enormous impact on harvests. Prior to the project a survey of local farmers revealed that 52% had lost all of their crops to cattle, but after the installation of fences no crops had been lost in this manner.

## Annex 1: Report of progress and achievements against logframe for Financial Year 2022-2023

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
<p><b>Impact</b></p> <p>The Agnalazaha Forest with its rare fauna and flora is successfully conserved with livelihood gains for the local community</p>		<p>Compared to the previous two years in YR2 of this project: the density of the CR lemur (<i>Eulemur cinericeps</i>) remained stable, the area of the protected area that burnt remained stable and the number of tree stems cut reduced (Evidence Impact).</p> <p>In total the compensation received by the local community was £6,237 (Evidence Impact)</p>	
<p><b>Outcome</b></p> <p>Degradation of Agnalazaha Forest is reversed (with participation and livelihood gains for local men and women) by providing hedges as demonstrably useful, effective, long-term and realistic alternatives for crop protection</p>	<p>0.1 In YR2 and YR3 number of tree stems extracted from the forest during the year reduced by 30% compared to baseline (T0)</p> <p>0.2 By end of YR3 trunk basal area within forest adjacent to farmer's fields has increased by 5% from T0</p> <p>0.3 By end YR3 surveys species-level lemur and forest bird abundance within parts of forest previously degraded by collection of fencing stakes has increased on average by 10% from T0.</p>	<p>0.1. In 2021 (T0), prior to the project, the 79,550 stems were cut from the Agnalazaha PA forest to make fences. In YR2 of the project no poles were extracted from the forest because all farmers (= 60) wishing to protect their crops installed barbed wire fences. (Evidence Outcome 1)</p> <p>0.2 N/A in YR2</p> <p>0.3 The T0 data on lemur and large bird density in the exploitation zones is presented in Evidence Outcome 3.</p> <p>0.4 In YR2 100% of participating farmers reported no loss of crops.</p> <p>0.5 N/A in YR2</p> <p>0.6 Not monitored in YR2.</p>	



	<p>0.4 At end of YRs1, 2 and 3 the 35 participating farmers report zero loss of crops to free-ranging cattle from plots included in project and link these gains to tangible livelihood benefits.</p> <p>0.5 At end YR3, 90% of all local farmers (ca. 120 in total) state they intend to install hedges to protect their crops post-project and without incentives</p> <p>0.6 At end of YR1 90% of project participants understand and can articulate the basic elements of sustainable use of natural resources i.e. the concepts of “need”; “stock” and “growth of stock” and the relationships between these three elements</p>		
<b>Output 1.</b> A critical mass (~30%) of agricultural plots within the buffer zone of protected areas are protected effectively from incursion of livestock using barbed wire fences	1.1 By end of YR 1 30% of agricultural plot area (~35 farming families) in buffer zone of protected area protected from incursion by livestock using barbed wire fences.	1.1. 12.15 ha of plots belonging to 60 farming families protected from incursion of livestock with barbed wire fences (Evidence Output 1.1)	
Activity 1.1 Radio broadcast and village workshops to launch of project to local community including solicitation of advice leading to adaptation		Completed YR1	Ongoing communication to inform stakeholders of progress of project
Activity 1.2 Workshop to select and orientate farmer participants		Completed YR1	NA
Activity 1.3 Workshop to train farmers in installation of barbed-wire fences with national expert		Completed YR1: farmers can now safely and professionally install bared wire fences themselves	NA

Activity 1.4 Installation of barbed-wire fences by participating farmers around their plots (4-strand fence for total 16 km; support posts every 2m)	Completed YR2, with 17 km of fences installed (Output 2.1)	Reflection on how to maintain fences (from rust and from rotting of posts)
Activity 1.5 Pre-intervention surveys to establish baseline knowledge and attitudes	Completed: surveys completed, audios transcribed into Antesaka text but not yet translated into English	Translate T0 surveys into English and dispatch to Greg for analysis
<b>Output 2.</b> Agricultural plots of the 35 participating farmers provided with long term protection with livestock- proof hedges	<p>2.1 After 30 months plots of all 35 participating farmers that were protected with barbed-wire fences are also surrounded by newly-laid hedgerows that are rich in useful plants including native trees and shrubs.</p> <p>2.2 After 30 months the young plants used to enrich the hedges planted 12 months previously show at least 80% survival and average growth exceeding 20 cm.</p>	<p>2.1. Cuttings of gliricidia and 10,000 young plants of native trees and shrubs have been planted along 17 km of barbed wire fences belonging to 60 farmers (Evidence Output 2.1)</p> <p>2.2. After 6 months average survival of out-planted native trees was 88%, to date growth is negligible (Evidence Output 2.2)</p>
Activity 2.1 Selection of women (unmarried mothers) nursery staff and two seed collectors	Completed in YR1	Coach nurserywomen to produce seedlings of fruit and spice trees so that experience and training is not wasted.
Activity 2.2. Installation of tree nursery	Completed in YR1	Maintenance of this valuable infrastructure
Activity 2.3 Installation of crèche associated for young children of nursery staff	Completed in YR1	Maintenance of this valuable infrastructure
Activity 2.4 Workshop to train nurserywomen in best practice for the propagation of shrubs and trees (provided by horticulturalist from Chester Zoo)	Completed in YR2 (Evidence Activity 2.4)	
Activity 2.5 Biweekly presentations on child care for nurserywomen from national experts	Completed in YR2 (Evidence Activity 2.5)	

Activity 2.6 Propagation of 16,000 seedlings of plants to be used to enrich hedges	Completed in YR2: 21,184 seedling produced (Evidence Activity 2.6)	Support nursery women to produce plants of fruit and spice trees for their own benefit.
Activity 2.7 Purchase and transport of living stakes (= 1 m long stems of plants that root is pushed into the soil)	Completed in YR2: 17 km of barbed wire fencing planted with stems of <i>gliricidia</i>	Replace any <i>gliricidia</i> stems that die
Activity 2.8 Inserting living stakes along line of barbed wire fence to create basic hedge structure	Completed in YR2: 17 km of barbed wire fencing planted with stems of <i>gliricidia</i>	Replace any <i>gliricidia</i> stems that die
Activity 2.9 Out-planting seedlings of native trees within lines of living stakes (hedge enrichment)	In progress: 10,000 plants of native trees and shrubs planted along 17 km of fence lines	Replace any plants that die with remaining stock in nursery
<p><b>Output 3.</b> Capacity of farmers and nursery staff is improved and they have the ability to independently create and maintain stock-proof hedges, or cultivate trees in plant nurseries, respectively.</p>	<p>3.1 At end of YR3 at least 80% of the 35 participating farmers can demonstrate the necessary knowledge and skills to install and maintain hedges.</p> <p>3.2. At end of YR3 at least 80% of the women employed in the tree nurseries can demonstrate the necessary knowledge and skills to propagate and cultivate useful plant species</p> <p>3.3 During YR3 the ten nursery women generate income (average £20 per month) from the production and sale of fruit and spice trees</p> <p>3.4. At end YR3 50% more local adults perceive women as capable of being effective nursery staff compared to T0</p>	This Output is planned for YR3
Activity 3.1 Workshop to train participating farmers in maintenance of their hedges (provided by expert hedger from the UK)	Not completed: activity of YR3/4	Implement this activity

Activity 3.2. Farmers coached to maintain hedges and evaluated.		Not completed: activity for YR3/4	Implement this activity
<b>Output 4.</b> Best practice model for protecting forests by developing sustainable crop protection techniques and livelihoods (i.e. use of hedges and enabling access to employment in tree nurseries for young mothers) is developed and shared with other conservation and development organisations operating in Madagascar	4.1 In YR3 representatives from 15 conservation and development organisations have visited Agnalazaha and reviewed the project	This Output is planned for YR3/4	
Activity 4.1. Communication about project through social media		In progress: 11 tweets about the project made in YR2 (Evidence Activity 4.1)	Continue this activity
Activity 4.2. Organisation of study trip to Agnalazaha for representatives for an array of conservation/development NGOs.		Not completed	Implement activity
<b>Output 5.</b> Effective project implementation based on adaptive management	5.1 At any time project managers have access to objective information of project progress based on indicators listed above	Monthly meetings of the Projected Area management team held, information shared and issues arising discussed (Evidence Output 5.1)	
5.1. Workshop to define monitoring protocols and to train monitoring team in their application		First version completed in YR1 but, protocols for social monitoring revised in YR2 (Evidence Activity 5.1)	Greg continues to coach field team in application of protocols.
5.2 Support for monitoring team to apply monitoring protocols		Monitoring completed as planned but on-going (Evidence Activity 5.2)	Continue to support team to apply monitoring protocols
5.3. Workshops to share information on project progress, to identify issues arising and to modify interventions to maximise efficacy		Workshop of whole project team (MBG, CZ, project staff) was held on site from 11-17 July.	A second whole team workshop is planned for August 2023.
5.4. Formal reporting		Completed	Continue reporting following partner requirements.

## Annex 2: Project’s full current logframe as presented in the application form

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<b>Impact:</b> The Agnalazaha Forest with its rare fauna and flora is successfully conserved with livelihood gains for the local community			
<p><b>Outcome:</b>  <b>Degradation of Agnalazaha Forest is reversed (with participation and livelihood gains for local men and women) by providing hedges as demonstrably useful, effective, long-term and realistic alternatives for crop protection</b></p>	<p>0.1 In YR2 and YR3 number of tree stems extracted from the forest during the year reduced by 30% compared to baseline (T0) (= ca. 1,000,000 stems based on current estimates).            0.2 By end of YR3 trunk basal area within forest adjacent to farmer’s fields has increased by 5% from T0            0.3 By end of YR3 surveys, species-level lemur and forest bird abundance within parts of forest previously degraded by collection of fencing stakes has increased on average by 10% from T0.            0.4 At end of YRs1, 2 and 3 the 35 participating farmers report zero loss of crops to free-ranging cattle from plots included in project and link these gains to tangible livelihood benefits. (compared to average of 12% loss at T0)            0.5 At end YR3, 90% of all local farmers (ca. 120 in total) state they intend to install hedges to protect their crops post-project and without incentives            0.6 At end of YR1 90% of project participants understand and can articulate the basic elements of sustainable use of natural resources i.e. the concepts of “need”, “stock” and “growth of stock” and the relationships between these three elements</p>	<p>0.1 Report showing counts of newly cut-stems used to fence agricultural plots within vicinity of protected area (within 2 km) at T0 and, using same methodology, at YR2 and YR3.             0.2 Report showing measurements of trunk basal area per unit area in replicated plots at T0 and again at the end of YR3/Comparisons of forest quality in YR3 compared to T0 using the Global Forest watch tools             0.3 Annual report showing results of monthly standardised counts of lemur and bird species along replicated transects within target zones.             0.4 Report showing results of questionnaires among participating farmers.             0.5 Report showing results of questionnaires using Likert scale and open-ended questions among all farmers operating in peripheral zone of protected area             0.6 Report showing results of oral test of understanding among project participants</p>	<p>The provision of alternative methods of protecting crops from livestock will reduce need for fences made from stems extracted from the forest             Forest and biodiversity not negatively impacted by exceptional events such as wildfires, cyclones, hunting parties.            (Mitigation: continuing support for entire program of conservation activities at this site and integration of capacity of adaptation within project design)             Farmers are receptive to the new techniques shared and that hedges are not damaged/sabotaged by those communities/individuals not involved in this project.            (Mitigation: engagement with whole community through comprehensive consultation and communication).             The covid-19 pandemic does not prevent free movement of project participants            (Mitigation: support strong-site based team that can, in the worse-case scenario, be trained virtually by international participants and then play the role of trainers themselves or in some cases, rescheduling activities)             There are sufficient remnant lemur and bird populations in the nearby higher quality forest to rapidly recolonise the areas where a reduction in exploitation of young trees for fencing stakes enables forest regeneration.            (Mitigation: MBG’s program of activities at this site continues to support action to control hunting)</p>

<p><b>Outputs:</b></p> <p><b>1.</b> A critical mass (~30%) of agricultural plots within the buffer zone of protected areas are protected effectively from incursion of livestock using barbed wire fences</p>	<p>1.1 By end of YR 1 30% of agricultural plot area (~35 farming families) in buffer zone of protected area protected from incursion by livestock using barbed wire fences.</p>	<p>1.1a Maps showing the boundaries of all agricultural plots located in buffer zone (using a GPS Unit) with classification as either traditional fences or barbed wire</p> <p>1.1b Report showing results of interviews using Lickert scale and open-ended questions with samples of farmers with plots protected with barbed wire versus plots protected with traditional fences concerning the efficacy of barrier (35 farmers interviewed in each group)</p>	<p>Barbed wire not stolen (Mitigation: engagement with whole community through comprehensive consultation and communication – especially engaging the local traditional leaders to publicly express their support for the project).</p> <p>Barbed wire effectively protects the agricultural plots from incursion by livestock (Mitigation: training and coaching in best practice for the installation and maintenance of fences)</p> <p>Barbed wire does not cause dismay among livestock owners (i.e. does not injure cattle) (Mitigation: engagement with whole community through comprehensive consultation and communication, openness to receiving feedback and objections).</p>
<p><b>2.</b> Agricultural plots of the 35 participating farmers provided with long term protection with livestock- proof hedges</p>	<p>2.1 After 30 months plots of all 35 participating farmers that were protected with barbed-wire fences are also surrounded by newly-laid hedgerows that are rich in useful plants including native trees and shrubs.</p> <p>2.2 After 30 months the young plants used to enrich the hedges planted 12 months previously show at least 80% survival and average growth exceeding 20 cm.</p>	<p>2.1 Map showing the boundaries to all plots where hedges have been installed using GPS Unit.</p> <p>2.2 Inventory of condition (i.e. dead or alive) and growth of young trees and bushes used to enrich and reinforce the hedges.</p>	<p>Tree and shrub species that make effective hedges and that survive and grow well under the harsh conditions at this site can be identified and propagated. (Mitigation: from MBG's botanical knowledge at the site create a target list of likely species i.e. that are fast-growing, ideally spiny and regenerate robustly when cut)</p>
<p><b>3.</b> Capacity of farmers and nursery staff is improved and they have the ability to independently create and maintain stock-proof hedges, or cultivate trees in plant nurseries, respectively.</p>	<p>3.1 At end of YR3 at least 80% of the 35 participating farmers can demonstrate the necessary knowledge and skills to install and maintain hedges.</p> <p>3.2 At end of YR3 at least 80% of the women employed in the tree nurseries can demonstrate the necessary knowledge and skills to propagate and cultivate useful plant species</p> <p>3.3 During YR3 the ten nursery women generate income (average £20 per month)</p>	<p>3.1 Report summarising the results of a test of participating farmer's hedge making skills (provided by UK master hedger).</p> <p>3.2 Report showing results of questionnaires among participating nursery staff</p> <p>3.3 Accounts of income generated from the sale of fruits and spice trees produced by nursery women</p>	<p>At least 30% of local farmers are prepared to invest their time and energy in trialling a new method for protecting their crops. (Mitigation: a budget line has been included to provide participants with food during work associated with the project – so they will not experience extra hardship from participation)</p>

	from the production and sale of fruit and spice trees 3.4. At end YR3 50% more local adults perceive women as capable of being effective nursery staff compared to T0	3.4 Report of market day interviews using Lickert scale and open-ended questions with local adults.	
4. A best practice model for protecting forests by developing sustainable crop protection techniques and livelihoods (i.e. use of hedges and enabling access to employment in tree nurseries for young mothers) is developed and shared with other conservation and development organisations operating in Madagascar	4.1 In YR3 representatives from 15 conservation and development organisations have visited Agnalazaha and reviewed the project	4.1 List of people and their employer visiting Agnalazaha to review the project with each providing a written evaluation of the work and the extent to which elements are applicable at the locations where they work	Despite Agnalazaha being located in a remote part of SE Madagascar and a 2-day drive from the capital, influential people can still be persuaded to invest their time in visiting the site. (Mitigation: investment in good national-level communication during the whole project to make the conservation community aware of the work and to pique their interest)
5. Effective project implementation based on adaptive management	5.1 At any time project managers have access to objective information of project progress based on indicators listed above	5.1 3-monthly reports of project progress with minutes of meeting of Project team to discuss and address any issues arising	
<p><b>Activities</b> (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)</p> <p>1.1 Radio broadcast and village workshops to launch of project to local community including solicitation of advice leading to adaptation</p> <p>1.2 Workshop to select and orientate farmer participants</p> <p>1.3 Workshop to train farmers in installation of barbed-wire fences with national expert</p> <p>1.4 Installation of barbed-wire fences by participating farmers around their plots (4-strand fence for total 16 km; support posts every 2m)</p> <p>1.5 Pre-intervention surveys to establish baseline knowledge and attitudes.</p> <p>2.1 Selection of women (unmarried mothers) nursery staff and two seed collectors</p> <p>2.2 Installation of tree nursery</p> <p>2.3 Installation of crèche associated for young children of nursery staff</p> <p>2.4 Workshop to train nurserywomen in best practice for the propagation of shrubs and trees (provided by horticulturalist from Chester Zoo)</p> <p>2.5 Biweekly presentations on child care for nurserywomen from national experts</p> <p>2.6 Propagation of 16,000 seedlings of plants to be used to enrich hedges</p> <p>2.7 Purchase and transport of living stakes (= 1 m long stems of plants that root if pushed into the soil)</p> <p>2.8 Inserting living stakes along line of barbed wire fence to create basic hedge structure</p> <p>2.9 Out-planting seedlings of native trees within lines of living stakes (hedge enrichment)</p> <p>2.10 Workshop and coaching of farmers to lay hedges (provided by expert hedger from UK)</p> <p>3.1 Workshop to train participating farmers in maintenance of their hedges (provided by expert hedger from the UK)</p> <p>3.2. Farmers coached to maintain hedges and evaluated.</p> <p>4.1. Communication about project through social media and website</p>			

- 4.2. Organisation of study trip to Agnalazaha for representatives for an array of conservation/development NGOs
- 5.1. Workshop to define monitoring portocols and to train monitoring team in their application
- 5.2 Support for monitoring team to apply monitoring protocols
- 5.3. Workshops to share information on project progress, to identify issues arising and to modify interventions to maximise efficacy
- 5.4. Formal reporting



## Annex 3: Standard Indicators

Table 1

### Project Standard Indicators

2.2 After 30 months the young plants used to enrich the hedges planted 12 months previously show at least 80% survival and average growth exceeding 20 cm.

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A04	At end of YR3 at least 80% of the women employed in the tree nurseries can demonstrate the necessary knowledge and skills to propagate and cultivate useful plant species	Number of people applying new capabilities (skills and knowledge) 6 (or more) months after training in propagation of trees	People	Women (young, and unmarried)	0	10		10	10
DI-A06	After 30 months plots of all 35 participating farmers that were protected with barbed-wire fences are also surrounded by newly-laid hedgerows that are rich in useful plants including native trees and shrubs.	Number of people with improved protection of crops from barbed wire/hedges for improved well-being	People	Men and their households	0	60		60	35
DI-B09	After 30 months plots of all 35 participating farmers that were protected with barbed-wire fences are also surrounded by newly-laid hedgerows that are rich in useful plants including native trees and shrubs.	Number of households not needing to remove stems of native trees from forest to make fences to protect their crops	Households	none	0	60		60	35
DI-B10	Not included in these terms in original project	Number of farmers and nurserywomen reporting an adoption of livelihood improvement practices as a result of project activities.	people	Men/women	0	60/10		60/10	35/10

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-C02	Not included in original project	Number of assessments of stock of fencing posts submitted for publication	Number	Fencing posts, study with plots	0	1		1	1
DI-C04	Not included in original project	New assessments of community use of tree stems for making fences submitted for published	Number	Fencing posts, study with plots	0	1		1	1
DI-C12	Not included in original project	Number of tweets	Number	tweets	4	11		15	30
DI-C17	Not included in original project	Number of unique papers submitted to peer reviewed journals	Number	None	0	1		1	2
DI-D01	Not included in original project	Hectares of habitat (= area of Agnalazaha Forest) under sustainable management practices.	Hectares	Protected area	0	2745		2754	0
DI-D02	0.4 At end of YRs1, 2 and 3 the 35 participating farmers report zero loss of crops to free-ranging cattle from plots included in project and link these gains to tangible livelihood benefits. (compared to average of 12% loss at T0)	Number of people whose disaster/climate resilience has been improved due to protection of crops from grazing.	Households	Number of households benefitting from protective fences/hedges	0	60		60	35
DI-D09	Not included in original project	Number of hectares where deforestation has been avoided due to provision of alternatives to poles through project support	Hectares	Area of PA where tree stems are exploited	0	256		256	256
DI-D10	0.4 At end of YRs1, 2 and 3 the 35 participating farmers report zero loss of crops to free-ranging cattle from plots included in project and link these gains to tangible livelihood benefits. (compared to average of 12% loss at T0)	Area of improved sustainable agriculture practices benefitting people to be more resilient to weather shocks and climate trends.	Hectares	Area of plots protected from grazers	0	12.15		12.15	12.15

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-D11	1.1 By end of YR 1 30% of agricultural plot area (~35 farming families) in buffer zone of protected area protected from incursion by livestock using barbed wire fences	Number of people benefitting from improved sustainable agriculture practices and are more resilient to weather shocks and climate trends.	Households	Number of households benefitting from protective fences/hedges	0	60		60	35
DI-D16	1.1 By end of YR 1 30% of agricultural plot area (~35 farming families) in buffer zone of protected area protected from incursion by livestock using barbed wire fences	Number of households reporting improved livelihoods.	Households	Number of households benefitting from protective fences/hedges resulting in zero loss of crops	0	60		60	
DI-D18	0.1 In YR2 and YR3 number of tree stems extracted from the forest during the year reduced by 30% compared to baseline (T0)	Drivers of biodiversity loss (cutting of stems for fencing poles) reduced or removed.	Number of stems cut for fencing from within PA	Annual number of stems cut	79,550	0		N/A	0
DI-E01	0.1 In YR2 and YR3 number of tree stems extracted from the forest during the year reduced by 30% compared to baseline (T0)	Ecosystem Degradation Avoided (ha) by stopping removal of native tree stems for fencing (DEFRA / ICF KPI 8)	Area from which exploitation of stems for fencing avoided	hectares	0	256		256	256
DI-E03	0.3 By end YR3 surveys species-level lemur and forest bird abundance within parts of forest previously degraded by collection of fencing stakes has increased on average by 10% from T0.	Status of <i>Eulemur cinericeps</i> (CR)	Indivs/ha	Indivs./ha	1.28	1.12		N/A	1.4

**Table 2 Publications**

<b>Title</b>	<b>Type</b> (e.g. journals, manual, CDs)	<b>Detail</b> (authors, year)	<b>Gender of Lead Author</b>	<b>Nationality of Lead Author</b>	<b>Publishers</b> (name, city)	<b>Available from</b> (e.g. weblink or publisher if not available online)
The importance of Agnalazaha Forest Madagascar as a source of fencing poles for local farmers and the impact of this resource use on the forest.	Journal: Madagascar Conservation and Development	Amadou Ranirison; Fidy Ratovoson and Chris Birkinshaw (submitted)	Male	Malagasy	Madagascar Conservation and Development, Antananarivo	<a href="https://journalmcd.com/index.php/mcd/about">https://journalmcd.com/index.php/mcd/about</a>

## Annex 4: Onwards – supplementary material (optional but encouraged as evidence of project achievement)

### Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the <b>correct template</b> (checking fund, type of report (i.e. Annual or Final), and year) and <b>deleted the blue guidance text</b> before submission?	
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:BCF-Reports@niras.com">BCF-Reports@niras.com</a> putting the project number in the Subject line.	
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:BCF-Reports@niras.com">BCF-Reports@niras.com</a> about the best way to deliver the report, putting the project number in the Subject line.	
<b>Have you included means of verification?</b> You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	
<b>Do you have hard copies of material you need to submit with the report?</b> If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 16)?	
Have you involved your partners in preparation of the report and named the main contributors	
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	