

Biodiversity Challenge Funds Projects

Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus Half Year Report

Note: If there is any confidential information within the report that you do not wish to be shared on our website, please ensure you clearly highlight this.

Submission Deadline: 31st October 2022

Project reference	28-012
Project title	Native grass forage management to feed people and protect forests Alternative titles: Harena Voajanahary sy Kijana Mamokatra; Darwin Initiative - Productive Pasture Partnership (DI-PPP)
Country(ies)/territory(ies)	Madagascar
Lead partner	Royal Botanic Gardens, Kew (Kew)
Partner(s)	Missouri Botanical Gardens Madagascar (MBG), Royal Botanic Garden Edinburgh (RBGE, Caroline Lehmann), University of Pretoria, Plant and Soil Sciences Department and Enterprises University of Pretoria (UP, Wayne Truter), Sarobidy Rakotonarivo, consultant sociologist (University of Antananarivo, School of Agronomy)
Project leader	Maria Vorontsova & Mamy Tiana Rajaonah
Report date and number (e.g. HYR1)	April 2022 – September 2022 HYR1
Project website/blog/social media	Project Facebook page https://www.facebook.com/KMCCMBG Twitter @vorontsovams; photos at https://www.flickr.com/photos/36803481@N06/ ; videos at https://www.youtube.com/channel/UCF-lArgyzK3zMvdG0fCe7hw

1. Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).

Output 0: project setup and wellbeing.

The baseline survey of the socio-economic parameters of the beneficiary households (86 households) as well as households in the control groups (75 households) was completed at the three sites by the project animators. Prior to the survey, all project staff received training on the ethics and sociology of data collection and management from Sarobidy Rakotonarivo. The baseline data includes several datasets. Global Person Generated Index (GPGI) criteria indicated average subjective well-being (**Activity 0.9**). Beneficiary expectations of the project activities are positive, including forage sorghum crop effect on household cattle productivity (>88% of households reported positive answers), crop residue preservation effect on household cattle productivity (>85% of households reported positive answers), and native forage grass effect on household cattle productivity.

Two sets of expert site visits were carried out: Caroline Lehmann looking at fires in June, and Wayne Truter with Maria Vorontsova looking at pastures and livestock in September – October. Beneficiary feedback meetings and training sessions were held during these visits. Beneficiary meetings have however taken place less frequently than originally planned, due to the volume of project setup work during the first 12 months.

Output 1: grasses and pastures.

Experimental project pastures (1ha burnt and 1ha unburnt) are now fully set up and fenced in, with firebreaks all around (**Activity 1.2** and **Activity 3.2**). The Ibity and Ankafobe experimental pastures were burnt in April and June respectively (end of the wet season). The one in Itremo will be burned after the first rain (next November) to see the difference.

On the study of the frequency and diversity of native grasses in experimental and communal pastures (**Activity 1.4** and **Activity 1.5**), the following activities were completed: 20 standardised plot surveys on communal pastures and demonstration pastures in Ibity and Itremo; 130 grass and forb herbarium voucher specimens collected including plot vouchers as well as regional grass surveys for Ibity and Itremo; 60 biomass samples collected for biomass productivity measurements on the demonstration pastures (3 sites); 6 grass species strike/non-strike datasets collected for grazing capacity calculation in the demonstration pasture (3 sites). With the assistance of Kew Madagascar botanists outside this project, 67 specimens of forbs including sedges from all plots were identified at least to genus level. Grass identification requiring observation under the microscope was completed for 81 specimens.

87 soil samples were collected across the 3 sites. Soil analysis shows that most soils are acidic, with low levels of nitrogen and phosphorus, and potential iron toxicity related to high iron content. This indicates that productivity would benefit from the addition of fertiliser and ash. The analysis of these data gives us the following results (**Activity 1.2** and **Activity 3.2**):

Table 1. Year 1 baseline pasture biomass productivity and local historic fire return times

Site	Burnt	Unburnt	Fire history
Ankafobe	2.4t/ ha	1.6t/ha	Annual fire, last fire 2021
Ibity	6.1t/ha	3.9t/ha	Fire frequency burnt: every 3-4 years Fire frequency unburnt: every 10 years
Itremo	2.67t/ha	2.9t/ha	Annual fire, last fire October 2021

We tentatively conclude that pasture biomass production has a close relationship to historic fire frequency in the area, suggesting that fires every 3 – 4 years or less may be connected to greater plant biomass in Ibity pastures. Ankafobe and Itremo project pastures have been subject to annual fires and have similar, lower biomass production.

Table 2. Grazing capacity calculation results for a South African standard livestock unit (LSU) and a typically smaller Malagasy zebu livestock unit (zebu LSU) for the project pastures. The calculations are based on rainfall and a custom ecological index (EI) calculated from dry weight estimates of grass species designated as increaser, decreaser, or exotic.

	Ibity unburnt	Ibity unburnt	Ankafo be burn	Ankafobe unburnt	Itremo burnt	Itremo unburnt
Rainfall (mm/year)	1583	1583	1430	1430	1416	1416
Fire frequency, years	>10	>10	1	1	1	1
Ecological index (EI)	364	418	393	401	464	475
Grazing capacity (Ha/LSU)	1.2	1.2	1.4	1.4	1.4	1.4
Grazing capacity (Ha/zebu LSU)	0.7	0.7	0.8	0.8	0.7	0.7

According to our results, one zebu needs 0.7 – 0.8ha/year for its complete nutritional needs in these experimental pastures. This value appears plausible; for increased confidence these estimates will be repeated in the wet season when the necessary data (grass species, their biomass, rainfall, etc) will be gathered at the same time to minimise the effects of annual variability.

Maria Vorontsova and Olinirina Nanjarisoa delivered training on grasses at the three sites (**Output 1.6**).

Output 2: livestock and their nutrition.

The project animators were trained in soils, fodder, grazing and overall farming techniques in South Africa (University of Pretoria) by Professor Wayne Truter (**Activity 2.11**). This training is very important as it will improve and increase the production and storage of fodder for zebus.

Project cattle was acquired as follows: for Ankafobe, the 4 cows are all already bought and 2 of them are pregnant. For Ibity and Itremo, 2 cows per site were purchased last March, the team is currently looking for remaining cows (2 cows for each site). For Ibity, 1 cow has a calf (6 months) and 1 cows pregnant. For Itremo, 2 cows are also pregnant (**Activity 0.5**).

Construction of the cowsheds for the project cows has been completed for Ibity and Itremo (cowshed for 4 cows per site) while for Ankafobe, the cowshed will be rebuilt due to a construction defect. In addition to these cowsheds, we also had to build a storage shed for each site for farm work (silage, hay storage, etc.).

Regarding the activities at the demonstration site, good production was achieved on the trial planting of local sorghum and Brachiaria varieties (**Activity 2.3, 2.4, 2.6**). In Itremo, on a 1ha field, 365kg of sorghum silage (0.5ha) and 165kg of Brachiaria hay (0.5ha) were obtained. In Ibity, on a 2ha field, 230kg of sorghum silage (1ha) and 110kg of Brachiaria hay (1ha) and 155kg of native grasses hay were obtained. And in Ankafobe, due to the drought (lack of rain) reported in the previous report, only 22kg of sorghum silage was obtained.

The 90 project beneficiaries (30 per site) are currently engaged and have shown real motivation for project activities. They own a total of 150 female zebus, with a small herd of 1-5 per household (**Activity 0.6**). Baseline surveys of participant householder cattle are complete (**Activity 2.1**). According to this baseline, the average milk production per day of those who milked their cows is as follows: 0.19L (Itremo), 0.46L (Ibity) and 0.49L (Ankafobe). We monitored beneficiary milk production in Ibity as it is the only project site where milk production is popular, and beneficiaries were given the opportunity to grow sorghum for making silage. The evolution of milk production is as follows: 0.93L in May, 0.61 in June, 0.79L in July, and 1.61L in August (**Activity 2.8** and **Activity 2.9**). We tentatively conclude that feeding cows silage and hay from native grasses increases milk production especially in the dry season.

In Ibity, 50% of households have successfully fed silage and hay to their zebu for the first time. They have stored 150kg of hay during the wet season and made 120kg of silage using local variety of sorghum (**Activity 2.4, 2.6, 2.7**). Five households based in the milk producing region of eastern Ibity have completed new barns using the same model as the demonstration farm.

Wayne Truter delivered training on pasture nutrition and livestock at the three sites, including personalised advice to individual householders as requested (**Activity 2.4**).

Output 3: fire management.

Caroline Lehmann's visit to Itremo PA in June gave us the opportunity to learn the methodology of setting up photo point monitoring schemes for the project forest patches. The forest patches in each PA are now identified and delimited (**Activity 3.7**), 50 ha for Ibity with 14 fixed photo points, 35ha for Ankafobe with 21 fixed photo points, and 10ha for Itremo with 20 fixed photo points. The standardised photographing of fixed points monthly from August continues for Ankafobe and Ibity, and a custom spreadsheet is filled in. The identification of the Itremo forest patches took place later due to a local incident described in the next section, and the Itremo project team started to take photos in September. Climate and rainfall data from Tinytags and rain gauges have been collected from April in Ibity, from April in Ankafobe, and from September in Itremo.

Caroline Lehmann delivered training on fire management at Itremo (**Activity 3.9**). We discovered a gap in our staff expertise for the more practical aspects of fire management including the initiation of preventative burns; instead of sending staff to South Africa we are negotiating with colleagues at the International Programs of the US Forest Service (change request already submitted).

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

With the exception of the Ankafobe fire, the following issues have already been addressed in the non-financial change request we have recently submitted.

Permits to import sorghum and export forage samples. Since the collapse of the company Hydromulch we have taken over the process of importing South African sorghum seeds to Madagascar, necessitating a diversion of resource to this complex process with the Ministry of Agriculture. Preliminary inspection visits to forage sorghum planting sites have been carried out by the Ministry's plant quarantine service to obtain approval for these sites. Visits during the sorghum planting cycle will also be planned to assess the health status of the sorghum. This activity will have an impact on the project budget as well as the timeline.

The nutritional analysis of the native grasses planned in South Africa has not yet been carried out due to difficulties with the export permit, which remains pending with the ministry due to a mismatch between the export weight permitted versus the weight required for a high-quality analysis (**Activity 1.5**).

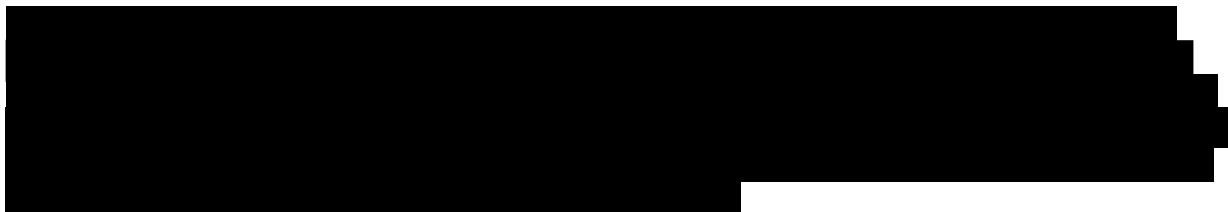
Need for veterinary services. Having learnt of the high priority need for veterinary services, we have arranged a collaboration with the regional government veterinary service. Veterinary specialists have visited the project sites and provided training to project staff, who are now delivering services to the project households. Veterinary medicines are also being purchased from the regional government veterinary service to ensure quality and safety.

Addition of manure and composting work. One aspect of the project we did not explicitly plan for is the production of fertiliser. In Ibity and Itremo the project farms have already generated 5m³ of compost and 1000kg in Ankafobe. We will use this compost to fertilise the sorghum field for the next plantation. Household visits with Wayne indicate that composting and fertiliser practice needs improvement across most of the beneficiary households, so this practice has been incorporated into the demo farm setup.

Firebreak methodology. Firebreak creation and maintenance through grazing with project cattle (**Activity 3.5**) have proved impractical due to the greater than expected distance between

villages and forests, and widespread concern about livestock theft. We are limiting the methods of firebreak creation to manual clearing and early burns.

Destructive fire at Ankafobe. Sadly, one of the two forest patches in Ankafobe was severely damaged by a fire on 5 October, with damage to all vegetation within the burn area estimated at 90% including savanna and forest. The double fire break was unsuccessful at preventing this forest fire, and the local community firefighting responders were not able to prevent the damage. We intend to use this opportunity for a thorough analysis of factors leading up to this fire.



3. Have any of these issues been discussed with NIRAS-LTS International and if so, have changes been made to the original agreement?

Discussed with NIRAS-LTS: No

Formal Change Request submitted: Yes

Received confirmation of change acceptance No

Change request reference if known:

4a. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this year?

Yes No Estimated underspend: £

4b. If yes, then you need to consider your project budget needs carefully. Please remember that any funds agreed for this financial year are only available to the project in this financial year.

If you anticipate a significant underspend because of justifiable changes within the project, please submit a re-budget Change Request as soon as possible. There is no guarantee that Defra will agree a re-budget so please ensure you have enough time to make appropriate changes if necessary. Please DO NOT send these in the same email as your report.

5. Are there any other issues you wish to raise relating to the project or to BCF management, monitoring, or financial procedures?

No

If you are a new project and you received feedback comments that requested a response (including the submission of your risk register), or if your Annual Report Review asked you to provide a response with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also be raised with NIRAS-LTS International through a Change Request. **Please DO NOT send these in the same email.****

Please send your **completed report by email** to BCF-Reports@niras.com. The report should be between 2-3 pages maximum. **Please state your project reference number, followed by the specific fund in the header of your email message e.g. Subject: 29-001 Darwin Initiative Half Year Report**