

Darwin Initiative Main and Post Project Annual Report

To be completed with reference to the “Writing a Darwin Report” guidance: (<http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms>). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Submission Deadline: 30th April 2020

Darwin Project Information

Project reference	26-017
Project title	Maximising community and conservation benefits from plants of Mount Mulanje
Country/ies	Malawi
Lead organisation	Botanic Gardens Conservation International (BGCI)
Partner institution(s)	Mulanje Mountain Conservation Trust (MMCT), Forestry Research Institute of Malawi (FRIM)
Darwin grant value	£338,252
Start/end dates of project	1 April 2019 – 31 March 2022
Reporting period (e.g. Apr 2019 – Mar 2020) and number (e.g. Annual Report 1, 2, 3)	Apr 2019 – Mar 2020 Annual Report 1
Project Leader name	Kirsty Shaw
Project website/blog/social media	https://globaltrees.org/news-blog/new-value-for-an-endangered-tree-to-serve-mulanje-mountain/
Report author(s) and date	Alex Hudson, Kirsty Shaw (BGCI) and Ibrahim Mitole (MMCT)

1. Project summary

Mulanje Cedar, *Widdringtonia whytei*, Malawi’s national tree, is found naturally only on Mount Mulanje, but is now almost extinct in the wild as a result of uncontrolled logging. The Malawian project partners, Mulanje Mountain Conservation Trust (MMCT) and the Forestry Research Institute of Malawi (FRIM) have been working in the Mount Mulanje reserve for over 20 years. The partnership between Botanic Gardens Conservation International (BGCI) and these two partners in Darwin project 23-026, which ended in March 2019, successfully established ten community nurseries around Mount Mulanje and initiated a large-scale restoration programme for Mulanje Cedar. The project also created a local and national market for cedar seedlings, improving the income of >600 people from rural communities around Mount Mulanje.

Project 23-026 demonstrated that livelihoods can be improved through sustainable utilisation of plant resources, rather than short-term gains through unsustainable exploitation, and instilled pride in the cedar amongst local people growing and planting it back onto the mountain. However, successful re-establishment of the cedar, and continued demand for cedar seedlings, is not assured until optimal protocols for cedar establishment on Mount Mulanje have been developed. Community nurseries will then continue to benefit from seedling sales.

Furthermore, human population pressure remains high around Mount Mulanje, employment opportunities are limited, and other tree species are being targeted by loggers instead of

Mulanje Cedar leading to a greater impact on the mountain's unique biodiversity. Communities are planting Mulanje Cedar within their homesteads, however this will not yield harvestable timber for c.30-40 years. Additional, short-term sustainable businesses that improve livelihoods and take pressure off the mountain are needed.

This project aims to expand opportunities for short-term community benefits from Mulanje Cedar by establishing sustainable cedar essence enterprises, harvested from cedar hedges and based on a precedent developed by The Body Shop in South Africa for a closely related species. This will increase the number of people benefiting directly from sustainable utilisation of Mulanje Cedar. The conservation-commerce model developed for Mulanje Cedar will be then be applied to other identified over-exploited plant species found on Mount Mulanje, maximising conservation and community benefits.

The project is taking place on and around the Mulanje Mountain Forest Reserve (see figure 1). This is a massif in South Malawi that rises from the lowlands (c.1,000m) up to the plateaux region (c.2,000m) and on to mountain peaks (the highest, Sapitwa, is 3,002m). The project incorporates communities from the two lowland districts around the mountains: Mulanje (south side) and Phalombe (north side). These are broken down into 7 and 6 Traditional Authorities respectively, each with their own local leadership, socioeconomic context and relationship with the mountain. There are over 30,000 households within these districts.



Figure 1 Mulanje Mountain Forest Reserve

2. Project partnerships

The main project partners (BGCI, MMCT and FRIM) have been brought together at numerous project events this year: The initial Steering Committee (SC) meeting (July 2019), the restoration trial planning meetings and fieldwork (September 2019) and the Nagoya Protocol and CITES Non Detrimental Findings (NDF) workshop (January 2020).

Steering Committee Meeting

The Project SC meeting in July included attendees from other advisory partners – Environmental Affairs Department (EAD), National Herbarium and Botanic Garden, Department of Forestry, Malawi University of Science and Technology and Africa Parks Network (APN). A representative from the Traditional Authorities, Senior Chief Chukumbu, also attended. The meeting minutes are in Annex 1. This meeting helped to refine the direction of the project and to plan events. It also defined the role of the SC:

- To meet two times each year with attendees' active participation in meetings.
- To guide the project and keep deliverables on track.
- To recommend additional partners to bring into the project.
- To help to measure project progress.
- The project team may also seek advice on certain matters in between SC meetings.

Expertise and other requirements for the new project and updates from the previous project (23-026) were also discussed in the meeting, as follows:

- Chemical science expertise needed to carry out essential oil analysis.
- Access and Benefit Sharing (ABS) experts needed to ensure Nagoya Protocol is abided by for project activities.
- Non-Disclosure Agreement (NDA) also needed for those institutes involved in essential oil development.
- Nursery certification scheme by FRIM to be completed
- 2 nurseries dropped out from the previous project, leaving 8
- At least 30,000 seedlings can be produced per year per nursery

Planning was started on the following activities for the first year:

- Ecological Restoration Alliance of Botanic Gardens (ERA) trip with experts from US, South Africa and Australia planned for September 2019.
- Feasibility study defined and planned to start in July/August 2019.
- Nagoya Protocol meeting planned for November 2019 (took place in January 2020 following delays – see lessons learned section 9).
- Hire of socio-economist planned with written Terms of Reference, job advertisement and applications needed by end of 2019.

Adaptive management:

- Due to the delay to receiving funding from the Darwin Initiative and the project start, budget changes were suggested for the MMCT Partner organisation costs budgets (see submitted and accepted change request in Annex 2 for details).
- Agreed that some of the plant survey budget could be used for ethnobotanical study.

A second SC meeting in April 2020 was postponed due to Coronavirus, and is being reorganised for September 2020.

Essential Oils partnerships

For the Mulanje Cedar essential oils development, partnerships have been developed with Mzuzu University, Essential Distillation Equipment (EDE) and the essence marketing and use consultant (Arthur Stevens). NDA have been signed between MMCT and these institutes, and with BGCI, to ensure the knowledge of the project and information gained through the research is not used for private gain elsewhere taking benefits away from communities around Mount Mulanje (see Annex 3 for 5 signed NDAs).

Arthur Stevens: appointed as the essence marketing and use consultant to carry out the feasibility study in which he outlined research protocols and which institutes in Malawi could implement the research. He also met with Amaravi and other national businesses produce essential oils or products that use natural ingredients and found them interested in potentially using Mulanje Cedar essential oils in products. These institutes would need to sign NDAs in the future before samples are sent to them for further exploration.

Muzuzu University: Associate Professor of Chemistry, John Kamanula, with expertise in essential oil analysis from natural products, has been appointed to undertake the analysis of the essential oils from Mulanje Cedar plants. Prof. Kamanula provided a proposal, timeline and budgets which were agreed with input from MMCT, BGCI and Arthur Stevens.

EDE: engaged as a potential supplier of industrial stills from South Africa. The feasibility study highlighted that no still producers exist in Malawi. Video meetings were held between MMCT, BGCI, the feasibility consultant, the essential oils researcher and EDE to discuss options for still size and what use the still could have in relation to other species. EDE have provided quotes for the purchase in the second project year.

Local communities: MMCT have been regularly engaging with communities, including with monitoring and support trips to the 8 established nurseries. Community volunteers were asked for and attended the hedge planting and management training.

Restoration partnerships:

ERA: Four members of the ERA (Kurt Dreisilker, The Morton Arboretum, USA; Louise Egerton-Warburton, Chicago Botanic Garden, USA; Carole Elliot – Kings Park & Botanic Garden, Australia; and Stuart Hall – Stellenbosch National Botanical Garden, South Africa) have been involved in planning for the restoration trials of the project. Video meetings were used to finalise a trip to Mulanje in September. The trip included staff from BGCI, MMCT, Department of Forestry (FD), FRIM and WeForest (WF). Previously planted sites on the mountain were visited, then the team met to discuss the trial design: the important parameters to monitor and what would be investigated with a draft design report produced afterwards (Report in Annex 4).

FD: staff supported MMCT in all restoration fieldwork and local community training activities.

WF: The partnership has been strengthened by their inclusion in restoration trial planning (see agreement in Annex 14). A project manager for WF restoration work around Mount Mulanje has been appointed and works from MMCT offices. WF Zambia and Malawi Country Director,

Matthias De Beenhouwer, has also contributed to the design and funding of the ethnobotanical survey.

Other partners:

A Malawian socio-economist, Robert Kafakoma (Training Support for Partners), was appointed to develop methods and complete the baseline socio-economic survey of communities around Mount Mulanje. This will be used to monitor the project impact on communities in the final year. Eight applications for this were sent to MMCT. The applications within budget (3 viable) were scored and ranked by MMCT and BGCI staff, based on methodology proposed, staff experience and expertise, and organisation experience and expertise (in Natural Resource management, economics and livelihoods, timeframe given and relevance). A final meeting was held with the highest scoring candidate to discuss and finalise the methodology and what was needed from the management team.

APN: MMCT have signed an agreement with APN for APN to use their experience running other National Parks in Africa to provide technical assistance and guidance to increase the overall conservation impact of MMCT’s work in the Mount Mulanje area (See agreement in Annex 5).

3. Project progress

3.1 Progress in carrying out project Activities

1.1 Ten nurseries, established and certified in project 23-026, produce a minimum aggregate total of 400,000 Mulanje Cedar seedlings in years 1-3, benefiting 150 nursery workers.

Two of the nurseries from project 23-026 ceased activities before the new project started in August 2019. This was due to poor performances and disagreements within the nursery groups, and because they had access to other livelihood opportunities whilst there was a delay to fund transfers leading to uncertainty of a continued market of seedlings for restoration. The remaining 8 nurseries have continued to propagate Mulanje Cedar seedlings. The number of seedlings propagated, planted in hedges and incomes produced are shown in table 1.

Table 1: The project community nurseries, their numbers of members, seedlings propagated, planted in hedges and income generated this project year. Note: 1-8 are community nurseries, 9 is smallholder tea farmers that do not propagate Mulanje Cedar seedlings, but were involved in hedge planting. Income in £ based on average rate for the year – 944.28

No	Name	# of Members		# seedlings propagated & purchased	Total income (MK)	# Seedlings planted as hedge
		Male	Female			
1	Kadewere	5	9	11,100		591
2	Makolera	1	15	14,200		2,502
3	Kazembe	2	6	7,950		1,131
4	Nessa	9	3	13,437		1,078
5	Chole	5	10	6,800		2,446
6	Nakhonyo	4	5	7,443		130
7	Gambeya	1	7	11,229		1,386
8	Lomoliwa	3	13	3,541		2,451
9	Sukambizi STA					10,000
	Totals:	30	68	75,700		21,715

1.2 Design and implement planting trials at 8 sites on Mount Mulanje by end of year 1, benefiting people employed to transport and plant seedlings. AND FRIM and restoration experts from BGCI’s network monitor planting trials in years 1, 2 and 3.

Four ERA experts visited Malawi to support the design of restoration trials. A draft design has been formulated, including parameters for data to be collected from Mulanje Cedar seedlings, the local environment around individual seedlings and the wider environment of plots (See files in Annex 4). Data have been collected from newly established plots on five previously planted sites to test the methods and analyse data to see if other parameters should be considered for the trials. This will be used to finalise the design, with the ERA experts support, ready for new plots to be planted in December 2020.

2.1 Write contracts for consultants by end of year 1 and Establish project steering committee to guide and monitor project progress and development of conservation-commerce model.

The steering committee was established and met in July 2019 (Meeting minutes in Annex 1). Contracts have been written and signed for the plant survey consultants (ERA expert and ethnobotanist), socio-economic consultant, essential oils analysis consultant, TRAFFIC consultant, essence marketing and use consultant (Contracts in Annex 6).

2.2 Commission study to improve understanding of Mulanje Cedar potential uses and markets, identify commercial partners and quantify potential income, complete by end of year 1.

The study to improve understanding of Mulanje Cedar potential uses and markets, identify commercial partners and quantify potential income was completed. This included a desk study (July 2019), a visit to Malawi to meet with commercial partners and understand the local context (August 2019) and a final report (November 2019). This provides an estimate for potential essential oil income stating "A cautious wholesale pricing level of around US\$15-18/kg". It also outlines protocols for essential oil research, reports on interest of potential commercial partners and provides initial summaries of 8 other potential economic species (Full report in Annex 7).

2.3 Workshop involving UEBT and TRAFFIC, determining Nagoya Protocol implications and ABS requirements for international oil trade, assessing whether wild harvesting might be appropriate in future

The workshop on the Nagoya Protocol implications and ABS requirements for international trade was held in January 2020. 30 people attended from Malawian businesses, the Environmental Affairs Department, BGCI, MMCT. In August 2019, Mulanje Cedar was listed on Appendix II on CITES. A presentation by the ABS Focal point, Ms Mphatso Kalemba was given on ABS in Malawi. A consultant, David Newton, from TRAFFIC International led activities on the use of the Non-Detrimental Findings (NDF) process as the starting point for implementing FairWild standards. This included initial NDF assessments of other Mulanje Mountain species and more detailed assessments of the Mulanje Cedar (A report from the workshop is in Annex 8).

2.5 MMCT and FRIM monitor nursery certification scheme and Cedar Growers and Planters Association (CGPA) (established in project 23-036) which becomes fully inclusive of planters for essence extraction by end of year 3.

Nurseries Nakhonyo and Kadewere were certified for achieving the minimum standards of grading their seedling stocks before planting out, outlined in the certification inspection report (see Annex 9). The certification process is carried out once a year and the 6 other nurseries have been supported by MMCT and the FD to improve their processes through regular monitoring and supervision visits. This has helped to build their capacity on Nursery Management practices to conform to the certification process for future certification.

The CGPA has been engaged in MMCT's strategic planning process and to develop an Integrated Management Plan for the whole Mulanje Mountain Forest Reserve.

3.1 Identify optimal sustainable extraction techniques for Mulanje Cedar essence by end of year 1.

The essential oil analysis consultant methodology and budget were negotiated and finalised at the start of 2020. This included a proposal application to the National Commission of Science and Technology (NCST) to allow Access and Collection to Genetic Resources (plants) (Proposal in Annex 10). The fieldwork to collect specimens from Zomba and Mount

Mulanje was carried out in March 2020. Some analysis of the samples collected was completed in early April 2020 with an initial report submitted at the end of April (in Annex 15). An issue with the institute’s Gas Chromatography – Mass Spectrometry machine, and delays to it being fixed due to the coronavirus, meant the chemical analysis has not been completed. Once done a full report of the results will be submitted in May or June 2020.

3.2 Send samples to potential national and international purchasers by end of year 1.

Due to the project start delays, and consequent delays to activities needed before this (marketing and use feasibility study, Nagoya Protocol Workshop, essential oil analysis), this will be done in April/May 2020, once NDAs have been signed. International purchasers are not going to be contacted due to expected difficulties in initially providing enough oil to service any international market, as highlighted in the feasibility study.

Following the engagement with potential purchasers, with further research into plant survival under different harvest regimes, it will be possible to calculate how much can be sustainably harvested per plant and then how many plants would be needed to service any industries.

3.3 Work with Traditional Authorities in year 1 to identify 150 people (60% women) from ten communities around Mount Mulanje to form essence extraction enterprises. AND Communities plant ten trial cedar hedge plantations using established seedlings at sites around the base of Mount Mulanje by end of year 1.

Traditional Authorities were engaged to promote the start of the project and explain the expectations of activities. 85 trial hedges, at 9 sites have been planted with 21,715 seedlings, using seedlings purchased from the nurseries (see table 1 above).

3.4 Train 150 people (60% women) in planting and management techniques for cedar hedge plantations by end of year 1.

175 (103 females) community members voluntarily took part in hedge planting and management training in February and March 2020. 105 were from the 8 nursery groups in February 2020. A further 70 members were block leaders from the community run tea estates who were identified to also been trained in March 2020.

3.5 Carry out socio-economic study in years 1 and 3 to monitor income obtained by essence extraction enterprises

This activity was changed so that it will take place in the first and final years of the project (changes mentioned in section “2. Project Partnerships”). The baseline study was carried out in February/March 2020 with the first report draft submitted in April (See Annex 11). This is later in the project year than initially planned as it took time to identify the appropriate consultant for the work, but as the income generating activities for the project come in years 2 and 3, conducting the study in February/March 2020 still provides a suitable baseline. The data collected are disaggregated by gender and involvement in project activities (See table 2). The report describes the current income, expenditure, savings and asset and land ownership status of households investigated.

Table 2: Interviewee details from the baseline socio-economic survey carried out by Robert Kafakoma, showing the splits across the two districts, whether male or female interviewees and whether they are beneficiaries to the project or not.

District	No. Project beneficiaries interviewed	Non-project beneficiaries interviewed	Total
Mulanje	61	147	208
% male	37.7	36.1	
% female	62.3	63.9	
Phalombe	41	32	73
% male	19.5	40.6	
% female	80.5	59.4	
Total	102	179	281

The report shows a variety of local contexts across Traditional Authorities (TA), based on local ecology, and so the farming systems (e.g. tea plantations in cooler and rainier conditions of Mabuka and Njema); and local geography (e.g. Mabuka and Njema being further from markets and banking or credit systems). This leads to different activities and resource use across the area (e.g. Woodlot ownership was also much higher in Mabuka, the TA least heavily populated and furthest from populated areas).

Some key points from the report are:

- Project beneficiaries of the previous Darwin Initiative funded project 23-026 said that they acquired a number of household assets using the income from the project.
- The major problems facing the people of Phalombe and Mulanje are hunger, lack of employment opportunities and financial problems.
- Free land for cultivation is scarce in communities so projects intervention, such as Mulanje Cedar hedge planting, have to take this into consideration in order not to create competition between food crop production and tree planting.
- Soil fertility loss and high prices of farm inputs are a main constraint to improve agricultural productivity.
- Improved transportation between Mulanje and Phalombe has opened markets for forest products like charcoal, firewood and other forest products.
- The tea estate sector relies up on the mountain for water to irrigate crops and provide hydropower, which may worsen with continued forest loss, therefore engagement with the tea estate sector as an interested party could be beneficial.

Comments have been provided to the author by BGCI and MMCT to improve the analysis for a finalised report in May 2020.

4.1 Conduct survey to identify other plant species of Mount Mulanje and their potential uses and commercial value in year.

The socio-economic baseline survey established there is a heavy reliance on fuelwood in both districts and that woodlot ownership is low so this resources is taken from the wild plants. Mkanda and Mkhumba TAs have better access and existing markets for forest products at the major trading centres in Phalombe and Mulanje and so these resources provide more incomes for people. Middlemen often buy from harvesters and sell the forest products in the main market centres of Phalombe, Mulanje, or outside the two districts.

An ethnobotanist has been appointed to survey villages from the following TAs: Nkanda, Mabuka and Njema in Mulanje District; and Mkhumba and Nkhulambe in Phalombe District. Focus group meetings, key informant interviews and household surveys will be used to investigate indigenous, useful and important plant species that have the potential to be economically developed. The initial literature review, preparation and submission to the NCST has been completed (Proposal and data collection sheets in Annex 12), however the survey was delayed by the onset of the Coronavirus pandemic.

4.2 Seed collected from est. 10 additional over-exploited species in years 1 and 2, stored at FRIM and distributed to at least ten botanic gardens.

Progress has been made in selecting species. The market and use consultant's feasibility survey named 10 species: *Aeollanthus myrianthus* subsp. *gamwelliae*, *Helichrysum orientale* (or other endemic *Helichrysum* spp.), *Lippia javanica*, *Piper capense*, *P. umbellatum* (not native to Malawi), *Tarchonanthus camphoratus*, *Clinopodium vernayanum* (endemic to Mulanje Mountain), *Tagetes minuta* (Not native to Malawi), *Commiphora africana* and *Commiphora schimperi*.

Attendees at the Nagoya Protocol workshop were also asked to identify native useful species from four categories (teas, medicinal, aromatic and timber) to assess the current resource use status. This produced 9 additional economically important taxa: *Myrothamnus flabellifolia*, *Pterocarpus angolensis*, *Khaya anthotheca*, *Podocarpus milanjanus*, *Hypoxis* spp., *Mondia whytei*, *Jateorhiza palmate*, *Prunus africana* and *Aloe arborescens*.

These data, with data from the ethnobotany survey and knowledge of exploitation levels of species, will be used to target species for seed collection and propagation in living collections at botanic gardens (e.g. the National Herbarium and Botanic Garden of Malawi).

3.2 Progress towards project Outputs

Output 1: Improved restoration protocols developed for Mulanje Cedar on Mount Mulanje, resulting in continued demand for seedlings for restoration.

At the ERA meeting in September 2019 it was decided that the restoration trials will need to investigate the impact of planting Mulanje Cedar with companion species, which may help seedlings to grow and thrive, and the impact of using fire resistant species in planting regimes to see if they protect seedlings from fire.

It was also noted that soil microbiota could be important to plant health and vigour and that soil communities found at sites most naturalised to Mulanje Cedar (i.e. where populations were found most recently) were not found in previously planted sites and in potted seedlings in nurseries (discovered from research in project 23-026 by Louise Egerton-Warburton). It was suggested this would be worth further investigation.

The baseline survival of seedlings from the 23-026 project was 30% and the restoration trials are still on track to test improvements to compare against this baseline.

Output 2: Conservation-commerce model developed and documented for Mulanje Cedar.

The Mulanje Cedar essential oil research is underway, that is needed to understand what business could be possible for a conservation-commerce model. The Nagoya Protocol workshop has helped to highlight what activities in the future may be important to ensure any industry is sustainable and does not lead to a detrimental impact on wild populations (e.g. use of FairWild Standard approach with the Non-Detriment Findings process). The documentation produced from these activities will be incorporated into the final documentation of what is needed for successful replication elsewhere.

Output 3: Manufacture of products from sustainably sourced Mulanje Cedar essence generates income for additional local households in the short-term and results in a larger market for cedar seedlings.

The quality and composition of essential oils identified in the research will help to define what products can be manufactured from it. Further engagement with business partners will help to understand what they would be interested in and what quantities they would need. This combined with the quantity that comes from leaves will help to define how many plants in hedges would be needed for industrial development and how much income could be generated by local households by growing hedges that can be harvested for the industry.

This output is still on track for completion in the final year of the project following engagement with potential purchasers early in year two.

Output 4: Conservation measures in place for other over-exploited plant species on Mount Mulanje and conservation-commerce model replicated for five important plant species on Mount Mulanje.

The species to be targeted for this output are still to be defined and finalised. In the final year of the project, this final list will be used to develop 3 new pilot study funding applications.

3.3 Progress towards the project Outcome

Outcome: Communities living around Mount Mulanje receive short-term benefits from sustainable utilisation of Mulanje Cedar and opportunities are identified for sustainable commercial use of other over-exploited plant species of Mount Mulanje

Communities are receiving short-term income benefits from the purchase of seedlings for hedge planting already (See table 1). The expanded opportunity from essence oil production is still in development, with samples to be sent to potential purchasers in order to understand the business opportunities. By the end of the project, this should be in a state to start to produce incomes for local communities that should extend beyond the project lifetime.

The identification of opportunities for sustainable commercial use of other over-exploited species has also progressed. Relevant local information about species needs to be compiled in order to make informed decisions about which to target for funding applications in the final year.

Outcome indicators and means of verification (in bold):

Indicator 0.1: Restoration protocols developed for Mulanje Cedar on Mount Mulanje improve survival rates by 30% compared to project 23-026 baseline, resulting in continued demand for seedlings for restoration:

Planning for the restoration trials to produce new restoration **planting protocols** has progressed and should be ready for new trial establishment just before the next wet season, in December 2020. Analysis of **seedling survival rates** from the trials will help to define the best protocols for survival of seedlings. The protocols will then help to improve the market for seedlings as restoration on the mountain is improved.

Community nursery members have received short-term income benefits for the purchase of seedlings to use in hedges as shown in nursery **records of seedling sales** (see table 1). These will continue to provide verification of short-term benefits accruing to community nursery members from project work. Other community members will also benefit from incomes for labour to carry seedlings up the mountain, to work on planting sites and to plant the sites.

Indicator 0.2: Documented example of the conservation-commerce model for Mulanje Cedar developed by end of year 3:

Activities which have been undertaken towards this have been recorded in reports (marketing and use feasibility study, essential oil compositional analysis, Nagoya Protocol workshop). These will be able to contribute to the final conservation-commerce **written record of the model project methodology**.

Indicator 0.3: Optimal extraction techniques identified for Mulanje Cedar essence by end of year 1 and essential oil produced and sold by communities, resulting in benefits for 150 local community members (60% women) and a market for Mulanje Cedar seedlings for essence extraction by end of year 3:

The essential oil consultant has completed the fieldwork and done some lab analysis with an initial short report submitted. Problems with GC-MS machine have meant composition analysis is not yet completed and this is required to outline the optimal **extraction methods**.

Training course attendance figures and certificates show 175 community members have received the nursery planting and management training. The attendance list will be used for the sustainable management training and business and market skills training in the project, so that the same group continue to receive non-economic benefits.

The **essence producer sales figures** will still be a relevant record when any industry begins to make community members incomes, in the final year of the project.

The first draft of the **Socio-economic survey report** for the first year has been submitted and commented on. The methodology used will be replicated in the final year of the project, to collect data to analyse the overall socio-economic change seen as a result of the project.

Indicator 0.4: Over-exploited plant species of Mount Mulanje are investigated for potential sustainable use by end of year 3:

19 species have been identified as having potential economic value. The current status of resource availability and exploitation of these species is needed to further define which species would be best to target for conservation and sustainable development in the future. The means of verification for this indicator, **seed collection and ex situ collection records** and **funding applications**, are still relevant for the final two years of the project.

3.4 Monitoring of assumptions

Assumption 1: Continued participation of local communities

Comments: This is still true with communities engaged by MMCT on a regular basis, including in the established nurseries. This has led to successful voluntary engagement by communities in the hedge planting training this year. Further engagement is underway through socio-economic and ethnobotanical surveys.

Assumption 2: Local politics and ethnic differences do not hinder progress of project activities

Comments: This is still true as no hindrances to progress have been seen this year.

Assumption 3: Income obtained from seedlings and essential oil replaces income from illegal exploitation activities and is regarded as an alternative, not an additional activity

Comments: This remains to be seen with the development of the essential oil industry. It will still be difficult to confirm if illegal loggers have converted away from logging because they would generally be less willing to confirm having done or are doing the illegal practice.

Assumption 4: Technical expertise is available to solve planting issues

Comments: Project partners at FRIM, the National Herbarium and Botanic Garden of Malawi, the ERA and TRAFFIC have ensured that the right expertise, nationally and internationally, has been on hand to provide technical guidance and support to solve the planting issues for Mulanje Cedar.

Assumption 5: Enough seed is produced from FRIM stands to continue to supply nurseries with sufficient seed

Comments: FRIM has continued to be able to provide seed to the nurseries in this year, although the amount provided (8.4 kg) was less than in previous years (C. 20 kg).

Assumption 6: Communities continue to be interested in nursery work

Comments: Two of the ten nurseries from project 23-026 ceased functioning before the project start in August. The remaining 8 nurseries have continued to work and propagate healthy seedlings and remain engaged and enthusiastic.

Assumption 7: Restoration and commercial market for seedlings is maintained

Comments: The market for seedlings has remained from the project and the new essential oil market, which would create a new sector for hedge seedlings, has progressed forward in the year.

Assumption 8: Malawians will continue to respond to public outreach campaign

Comments: Many public engagement activities are planned for the remaining years in the project, but businesses have been engaged and shown interest in using Mulanje Cedar essential oils in their products. Business and government ministers have also planted and shown interest in planting Mulanje Cedar trees, after public outreach done by FRIM and MMCT.

Assumption 9: Local politics and ethnic differences not inimical to creating a cohesive and representative essence producer association

Comments: So far no issues have been seen. This remains to be confirmed once essential oil use is confirmed. MMCT are engaging community members and leaders from as many Traditional Authorities as possible.

Assumption 10: Expertise is available to optimise extraction techniques and develop essence products

Comments: The relevant expertise was identified by the marketing and use consultant and these experts have been engaged to carry out the analysis to show how much oil can be produced of what quality from different sources - from different geographic locations, different

parts of the plants and plants of different age classes. This will be used to calculate what is needed for a sustainable industry. An industrial scale still provider has also been engaged.

Assumption 11: Communities are receptive to new business establishment

Comments: Community members have voluntarily been involved in training for hedge planting and management with a view to it being part of the new essential oil business development.

Assumption 12: Seed is available for collection from target species within the project timeframe

Comments: With two years remaining in the project, and so two seeding seasons, this is still possible.

3.5 Impact: achievement of positive impact on biodiversity and poverty alleviation

The Mulanje cedar is a sustainably managed commercial product, generating income for local households and the Malawian economy, and no longer threatened in the wild.

A key impact of the project is to expand opportunities for short-term community benefit to communities by establishing sustainable cedar essence enterprises. This will increase the number of people benefiting directly from sustainable utilisation of Mulanje Cedar providing employment opportunities that increase income and reduce poverty.

The initial research is underway that will be used to engage potential essential oil purchasers. Their responses will then allow us to calculate what is needed, in terms of source materials, to service new industry in a sustainable manner.

The Nagoya protocol workshop has started to path the way to ensuring benefits are shared equitably and that the industry does not harm the target species in the wild or result in environmental degradation or pollution along the whole product life cycle.

Since Mulanje Cedar trees are no longer available, loggers are removing other species for timber from the mountain instead, including planted Cypress and indigenous *Podocarpus milanjianus*. This is exacerbating the detrimental effect people are having on forests, biodiversity and the local watershed. These other species are likely to go locally extinct too without good alternative sources of income for people.

The new industry should provide alternative income sources for people, reducing the number of people relying on logging for their important livelihoods and so reducing pressure on these resources.

For re-planting Mulanje Cedar in order to recreate the biodiverse Afromontane evergreen Mulanje Cedar forests, improved survival rates are needed to ensure planting strategies do not switch to planting exotic species. The planting trials being designed will produce data that show how to carry out restoration of Mulanje Cedar on the mountain with improved survival rates.

The project team has also influenced national and international biodiversity policy. The lead project partners (BGCI, MMCT and FRIM) have been involved in preparing the proposal for listing of Mulanje Cedar on the appendices of CITES which was accepted in August 2019. An update to the Mulanje Cedar Management Plan has been included in the draft Integrated Management Plan required for Mulanje Mountain Biosphere Reserve status. This was supposed to launch in April 2020, but has been suspended because COVID-19 has meant the Malawi Government suspended all meetings/gathering/conference until further notice.

The partnerships created, between BGCI, MMCT and other supporting partners will continue to seek funds for related projects. These will include expanding restoration on Mount Mulanje as well as implementing restoration of other important and useful habitats of the mountain, such as the Miombo woodlands on the lower slopes.

98 members (68 women) of the 8 community nurseries have continued to receive incomes from the purchase of seedlings to use in hedge planting activities in the first project year (see Table 1 in section 3). A further 175 community members (103 women) have been trained how to plant and manage Mulanje Cedar hedges in preparation for the essence oil industry. The continued inclusion of women in this project will increase the recognition that women can bring income to households, making control over assets more balanced as a result.

50 additional people have received payments at 1,500 Malawian kwacha/day for transporting seedlings and planting 10,000 saplings on the mountain this year. For the hedge planting, payment for this labour was not needed because the seedlings were not taken up onto the mountain and it was done voluntarily by the participants.

The socio-economic baseline survey has been completed to describe the current economic situation, including disaggregated analysis by involvement or not in project activities and gender. This will enable benefits to be quantified at the end of the project based on project involvement and gender within communities, showing the higher level wider impact of the project on wellbeing.

4. Contribution to the Global Goals for Sustainable Development (SDGs)

Contributions made in 2019/2020:

SDG1: the project has provided incomes for local community members through the purchase of seedlings and to transport and plant seedlings. Communities have also started to be trained to be included in essential oil enterprises, which will contribute to incomes in the future.

SDG5: the project has continued to ensure that at least 60% of community members trained and involved in project activities are women improving the employment opportunities for women in the area.

SDG8: decent work opportunities have continued to be provided to nursery members and the development of new essential oil enterprises should provide future work opportunities.

SDG9: an industrial scale distillation equipment supplier has been engaged for the purchase of the main capital item, needed to enable communities to establish essential oil enterprises. This supplier has provided advice and a quote for purchase ready for the second project year.

SDG10: the first socio-economic survey has been completed to understand the current inequalities and to understand how this will change due to the project at its completion. People living around Mulanje are in the bottom 40% of income earners in Malawian society so supporting them is helping to address the inequality seen across Malawian society. The signing of NDAs with project partners and the development of Access and Benefit Sharing (ABS) strategies will help to ensure any benefits remain with these poorest once the concept is proven.

SDG12: the Nagoya Protocol workshop with NDF assessment of resources was completed as the first step towards developing sustainable management of the Mulanje Cedar resource so that it does not harm the wild populations.

SDG15: the ERA trips to Mulanje, meeting to discuss and define restoration trial designs and fieldwork to collect data on past planted sites has begun the process to improve the protocols for Mulanje Cedar restoration so that local conservation can be improved beyond the project.

Others that will be contributed to by the project:

SDG4 (indirectly) as increased income can be used to ensure children attend school and have materials (income obtained in project 23-026 supported this); SDG7 (indirectly) as restoration trials will improve planting on Mount Mulanje, restored forests will improve water supply, allowing additional hydropower schemes to be established; SDG13 through public engagement and planting. Climate change mitigation is a key driver for restoration on Mount Mulanje.

5. Project support to the Conventions, Treaties or Agreements

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Mulanje Cedar was listed on CITES Appendix II in August 2019. As a party to CITES the Malawian government is required to carry out the Non-Detrimental Findings process to show that trade of listed species is not damaging the wild populations. At the Nagoya Protocol workshop, David Newton from TRAFFIC, with expertise in trade of CITES listed species (e.g. *Pelargonium sidoides* in South Africa), led training on how to carry out an NDF process, which included government institute representatives taking part in the training.

The workshop included assessments for Mulanje Cedar and other economic species from the Mount Mulanje area. This exercise will be replicable on a yearly basis to ensure any trade that

develops from essential oils does not have consequences to wild plants, including the restored planted seedlings. David Newton has also provided advice on how to build on these assessments using FairWild methodology to ensure assessments incorporate broader elements of ABS.

Convention on Biological Diversity and Access and Benefit Sharing:

Aichi target 1: Awareness has been raised of the value of biodiversity and how it can be conserved through sustainable use at the Nagoya Protocol workshop in January 2020.

Aichi target 3: The essential oil analysis has progressed the main positive incentive for conservation and sustainable use of Mulanje Cedar for the future, this will come to fruition in the remaining years of the project.

Aichi target 4: The marketing and use consultant has engaged with numerous business, nationally and internationally, that would be willing to be involved in newly developed sustainable enterprise using Mulanje Cedar essential oils.

Government employees, including the staff from the NCST and Malawi's CBD National Focal Point, Ms Mphatso Kalemba, from the EAD, have also been included in project activities attending the Nagoya Protocol and NDF workshop in January 2020. This has helped to ensure the proper national guidelines are being adhered to for access and collection of plant genetic materials and for ABS. Future similar assessment meetings can help to ensure safe ecological limits for wild harvesting of any species are followed.

For ABS, forms for collecting Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT) from communities regarding their use of Mount Mulanje resources have been drafted with ongoing consultation with EAD officials to finalise (See forms in Annex 13).

Aichi target 7: Progress has been made towards sustainable forestry on Mount Mulanje through the preparation for restoration trials to improve Mulanje Cedar survival and the initial investigations of other economic species that could be incorporated into future sustainable management plans.

Aichi targets 12 and 13: The continued collection of genetically diverse seeds by FRIM, propagation by community nurseries and planting of Mulanje Cedar seedlings community managed hedges has helped to prevent the complete extinction of this Critically Endangered species, despite it now being almost extinct of mature seed-bearing trees on Mount Mulanje itself.

Aichi target 14: Indigenous local communities around Mount Mulanje, including women, have continued to be key participants in project activities, including raising local incomes. With the ecosystem services that this project aims to improve (water resources through restoration of upper watersheds, better management of other plant resources from the mountain, new essential oil enterprise income streams) the project should continue to provide benefits in many different ways as the project progresses.

The ethnobotanical study has been commissioned which will document plant use traditional knowledge in the area, protect this knowledge for local people and incorporate this into sustainable management plans that provide more benefits to local people. The Nagoya Protocol workshop has helped to ensure this is also carried out within national legislation and international obligations relevant to ABS.

In the Nagoya Protocol and NDF workshop in January, the CBD Focal Point, Ms. Martha Mphatso Kalemba from the EAD attended and delivered a presentation on the status of national ABS guidelines (published) and regulations (to be published in 2020). They have also supported the authorship of the Workshop report (attached in Annex 8).

Davis Kalima, from the Department of National Parks and Wildlife, the Malawi CITES focal point, took part in Nagoya workshop and contributed to the discussions whilst gaining a better understanding of the NDF process.

6. Project support to poverty alleviation

Table 3: Project beneficiaries and monetary and non-monetary benefits they received from April 2019-March 2020 and will receive in the future.

Beneficiary group	Monetary benefits received 2019-2020	Future monetary benefits	Non-monetary benefits received	Future non-monetary benefits
8 community nursery groups (70% of women)	9,084,000 MK received from 75,700 seedling sales, 21,715 of which have so far been used to plant in hedges	Sales for restoration trials and other restoration planting		
Community hedge planters / owners (% of women)		Income from the harvest of leaves for essential oil enterprises	168 trained (61% women) in hedge planting and management	Training in sustainable harvesting Training in Intellectual Property and market models Inclusion in CGPA to improve governance
Seedling transporters for restoration and hedges	1,500 MK/person/day was paid for transporting 10,000 sapling for restoration on the mountain	Income to transport seedlings for restoration trials and other restoration planting		

The socio-economic baseline survey has been completed to create a baseline with which to analyse the project impact on local socio-economic conditions in the final year.

7. Consideration of gender equality issues

98 nursery workers received money from the sale of 75,700 seedlings with 68 (69%) being women. 103 women have been trained to plant and manage hedges (61% of trainees). These women will receive further training on how to sustainably harvest Mulanje Cedar foliage for the essential oil enterprises being developed and in business management and marketing skills.

4 of the nurseries have a female manager and 6 have female nursery secretaries. This means that women are receiving more equitable responsibilities in the management of the nurseries and in the representation in CGPA, making the decisions more gender inclusive.

8. Monitoring and evaluation

Monitoring and Evaluation (M&E) strategy

The SC is responsible for the M&E of the project. The members' role is to analyse the progress of Activities and Outputs towards the project Outcome and to deal with issues that arise and suggest adaptive management options (see section 2. Partnerships) when needed to keep the project on track.

Socio-economic surveys of the communities around the mountain in the first year, as a baseline, and in the final year has been decided as the way to monitor the total impact of the project on livelihoods benefits. The first year survey has been done so that it can be disaggregated by gender and participation in project activities, the latter to show any difference in change of situation between those involved in the project and those not, on the project's completion.

Communities living around Mount Mulanje receive short-term benefits from sustainable utilisation of Mulanje Cedar

1. The initial feasibility study helped to define the protocols for essential oils analysis to understand what industry is possible (Activity 2.2).
2. This is being used by an expert from Mzuzu University (Prof John Kamanula), whose report will show the quality and quantity of oil can be optimally produced from Mulanje Cedar plants (Activity 3.1).
3. With this done samples can be sent to potential purchasers to gauge what products they could use the essential oils in and what price would be paid per kg/ml (Activity 3.2).
4. The Nagoya Protocol and CITES NDF workshop has provided an outline in the use of the NDF process and FairWild to ensure the right information is collected to understand what ecological and social limits to a sustainable industry (Activity 2.3).
5. The results from 2.3, 3.1 and 3.2 can then be used to ensure the right amount of hedges are planted in communities that can be sustainably harvested to provide oil for any newly developing industry (Activity 3.3).
6. The 175 community members trained to plant and manage hedges will be trained to sustainably harvest material from Mulanje Cedar, and in business and marketing skills, including staying Nagoya Protocol compliant. This group will gain any new short-term benefits from the sustainable utilisation of Mulanje Cedar (Activity 2.6, 3.4 leading to 3.5)
7. Membership of essence oil producers in the Cedar Growers and Planters Association (CGPA) to improve the communities' ability to negotiate prices fairly as a group beyond the lifetime of the project (activity 2.5).
8. The outreach programme later in the project will help to stimulate business for both seedlings from nurseries and essential oils in products from the hedges (activity 2.4)

Opportunities are identified for sustainable commercial use of other over-exploited plant species of Mount Mulanje

1. Information on other species has been compiled by the market and use feasibility study (activity 2.2) and the Nagoya Protocol and CITES NDF workshop (activity 2.3).
2. Direct local use of species from communities will be investigated in ethnobotanical survey, delayed due to Covid-19 pandemic (Activity 4.1), PIC and MAT will be negotiated with the Traditional Authorities and groups interviewed.
3. Activities 2.2, 2.3 and 4.1 will be used to identify other species that may be suitable for economic development and that are in need of conservation. Those with potential oil use would add value to the still being purchased for Mulanje Cedar oils by increasing its productivity throughout the year.
4. Seed collection trips in the second and third years will target selected species for storage at FRIM and *ex situ* living collections in botanic gardens (activity 4.2).
5. Collected seeds will also be used in propagation trials at community nurseries to create localised propagation protocols for those species (activity 4.3).
6. This will help to select other species that can be considered for future sustainable commercial development through other pilot studies (activity 4.4).

The indicators relevant to activities this year are:

- **Nursery sales figures** – seedlings propagated by nurseries and purchased to plant in hedges have been recorded by MMCT (see table 1 in section 3). This acts as a measure of seedling production and use of seedlings for restoration or hedge planting.
- **Steering committee minutes** – 1 held. The meeting minutes, written by BGCI and MMCT, acts as an indicator of the SC meetings that have been undertaken.
- **Consultant contracts** – 6 contracts for project consultants have been signed as a measure of involvement in relevant project indicators.
- **Published feasibility study** – the published report shows the completion of the study to understand potential uses and markets for Mulanje Cedar and has acted as a guide for

other project activities (essential oil research and identification of other over-exploited economic species).

- **Report from Nagoya Protocol Workshop** – the report provides evidence of the workshop findings. It details the implications and requirements for ABS compliance in the essential oil industry and any other industries using wild plant species from Mount Mulanje. It also describes how the FairWild standard can be used.
- **Cedar hedge plantations in place** – 85 hedges on 9 sites have been planted and are being looked after by communities and monitored by MMCT and FD. These indicate progress of the essential oil industry.
- **Training course attendance records and certificates (for hedge planting and management training)** – the list of 175 attendees at the two training course acts as a measure the training given indicator
- **Socio-economic survey** – the initial report from the socio-economic survey measures the current socio-economic situation of communities around Mount Mulanje.

There have been changes to the budget and timeframe of activities due to delays in receiving the funds from the Darwin Initiative. This caused the Mulanje Cedar marketing and use feasibility study to be delayed leading to follow on delays to other activities like the essential oils research and establishment of hedges. For this reason, some of the budget for purchasing of seedlings for hedge planting and restoration was moved into the second year.

M&E is shared between the project partners. BGCI is coordinating the project and bringing all reporting figures together for analysis to support decision making in SC meetings and for reporting. MMCT collects and collates the biological data from planting sites and economic data from communities (sales records and contracts with labourers) and ensures the timeline for activities is kept to and within budget. FRIM monitors the nurseries for certification once a year, monitors seed collections made and propagation carried out under controlled conditions at FRIM nurseries to create propagation protocols.

Information is shared between partners at meetings (including outside of SC) during field visits to Malawi and through regular communications over email and Skype or Zoom, in particular between the Project Managers from BGCI, Alex Hudson, and MMCT, Ibrahim Mitole. These regular online meetings are used to troubleshoot problems and confirm budget expenditure.

9. Lessons learnt

Regular catch up meetings of the Project Managers have kept activities going well and allowed us to ensure budgets were kept to, adaptively managing activities on a regular basis.

We began planning for important events with emails and meetings over Skype/Zoom early enough to ensure they were implemented as early as possible (Restoration trip with ERA experts and fieldwork in September, December and March). This has meant that despite the delayed start to the project, including the employment of BGCI's Project Manager after the receipt of year 1 funds, all first year activities have been started by March, if not completed until April, with the exception of the Ethnobotanical survey which has been forced to be delayed further due to the ongoing COVID-19 pandemic (year 1 payment has been sent with the initial literature review and tool developments completed - See Annex 12 for focus group and household survey tools).

It has taken longer than expected to get official responses from government institutes from applications that ensure research sticks to Malawi legislative frameworks and guidelines (e.g. to NCST and EAD). This is the normal processing time for these applications, but the full extent of what was needed only became understood at the Nagoya Protocol workshop in January 2020.

To improve this, we would engage with more parties in the build up to the Nagoya Protocol workshop to understand the government processes in more detail so that we can put more questions to those present at the workshop to make it more productive and to allow for simpler and smoother application processes following the workshop.

We would recommend engaging with government National Focal Points as early as possible to ensure national legislation and perspectives on Nagoya Protocol and CITES are understood and incorporated without delay. The delayed project start impacted this: It would have been good to hold the Nagoya Protocol workshop within the first 6 months but this was not possible because the Market and Use feasibility study submission had to be delayed until November.

The workshop itself was delayed further when organising because all important attendees (from EAD and TRAFFIC) could not make dates in November and December - these were unavoidable so in the circumstance the workshop happened as early as was possible.

We are going to continue to engage with government officials from EAD and NCST regarding the project, outside of project SC meetings where necessary. BGCI will organise separate meetings with the ABS National Focal Point, Ms Mphatso Kalemba during the next visit to Malawi. This will help to ensure all future activities remain ABS compliant.

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

Not applicable because first year.

11. Other comments on progress not covered elsewhere

The project has not been able to confirm the viability of essential oil business opportunities due to delays. The report on the analysis should be completed early in year 2. Oil samples have not yet been sent to potential national businesses and the manuals for extraction to guide sustainable harvesting has not yet been produced. These will be important to deciding how far the project proceeds with Mulanje Cedar Essential oil business opportunities. The next SC meeting is set for September when these activities will be completed so that it will be an opportunity to adapt the direction of the project if needed with all the expertise present.

For hedges, land availability to plant hedges on community owned land has been difficult to source in some communities. Expanding the hedge planting to non-beneficiary communities will increase the number of hedges planted and help to produce substantial amount of foliage for essential oil production.

The amount of Mulanje Cedar seed received from FRIM was lower this year, although the seedling availability for activities this year has been sufficient. However, for the coming year seed has not yet been received from FRIM and it has been noted a pest attack in Zomba has reduced the seed production of mature seed-bearing trees there, potentially leaving just the population in Chikangawa as a seed source.

12. Sustainability and legacy

Numerous institutes attended the Nagoya Protocol workshop: businesses, NGO and governmental. They were interested in the opportunities that may arise and how to stay ABS compliant in any enterprises that use native plant species. This means the project impact on ABS and sustainable use of plants will reach further than the direct project inputs in Mulanje and Phalombe.

The consultant who carried out the Mulanje Cedar market and use feasibility study engaged with other potential business partners for the future, including soap producers (e.g. Maluso Cooperative Union, Malawi Association for Small and Medium Enterprises and Kibebe) and detergent and cleaning material producers (e.g. Royale Chemical Enterprises Limited and Chemical Enterprise). These businesses are interested in the results of the essential oil analysis to see any viable business opportunities with Mulanje Cedar essential oil products.

The efforts to promote work have mostly been national so far, because the market and use feasibility study highlighted that any initial production quantities from hedges, if viable, are likely to be low and unable to supply larger international markets. However, the study did not discount international markets completely, with contacts made within specialised markets, such as ethical trade (e.g. Calmer Solutions, UK).

The exit strategy is still valid because 175 local people have received relevant training in hedge planting and management for any future essential oil industry. They will also receive training to sustainably harvest hedges for essential oil production once this is understood, making them the key beneficiaries of new short-term benefits from developed in this project.

The Nagoya Protocol and CITES NDF workshop has helped to plan for the future, beyond the project. A monitoring framework, using the FairWild standards, has been suggested to put in place that can be assessed yearly. This will ensure any industry is ecologically, economically and socially sound, based on relevant research evidence.

The ERA advisory trip and fieldwork, with restoration experts has started planning for the restoration trials. Initial data has been collected of previously planted sites in December using the data format suggested. This will now be analysed to suggest final changes to the planting strategy and data collection protocols for the restoration trials. New, robust planting protocols for Mulanje Cedar on Mount Mulanje will come from these trials and so improve future restoration practices.

Cedar Growers and Planters Association (CGPA) have been involved in Mount Mulanje management discussions and planning, which will continue. The essential oil enterprises will be supported to join the CGPA too so that they gain a say in future management decisions as well as benefiting from the strengthened business negotiation.

13. Darwin identity

During the Nagoya Protocol workshop and the initial steering committee, the Darwin Initiative logo was used on presentations alongside the partner institutes. Darwin Initiative was always mentioned as the funding supporter of the project as well. This will have spread the knowledge of the Darwin Initiative in Malawi.

The project webpage has also been published on the Global Trees Campaign website, which explains the project (<https://globaltrees.org/projects/save-our-cedar-malawis-national-tree/>) and explains the funder with the logo on the page.

A blog post has also been written about the start of the new project, written by the BGCI Project Manager, which mentioned the Darwin Initiative as the funder (<https://globaltrees.org/news-blog/new-value-for-an-endangered-tree-to-serve-mulanje-mountain/>).

The project is also promoted through the @BGCI and @globaltrees Twitter accounts.

14. Safeguarding

Non-Disclosure agreements have been signed between MMCT, as the partner leading work with communities around Mount Mulanje, and other project partners so that they may not disclose any information about the project and product development to other parties or for economic gain elsewhere.

We have also been working with TRAFFIC and EAD to ensure ABS agreements are in place with communities to safeguard their Traditional Knowledge. This will be collected during an ethnobotanical research study. We will put in place the processes so that it is understood that the information on species collected cannot be accessed without benefits that arise from the use of the data being accrued back to the communities the information came from, whether monetary or non-monetary.

BGCI is going to share guidance of seed collection with partners for future collection of other economic species to avoid over-harvesting and potential negative impacts on collected species.

15. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2019 – 31 March 2020)

Project spend (indicative) since last annual report	2019/20 Grant (£)	2019/20 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)				
TOTAL				

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2019-2020

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
<p>Impact</p> <p>The Mulanje cedar is a sustainably managed commercial product, generating income for local households and the Malawian economy, and no longer threatened in the wild.</p>		<p>Essential oil research complete.</p> <p>Nagoya protocol workshop completed in January 2020.</p> <p>Restoration trial design fieldwork and meeting held in September 2019.</p> <p>Fieldwork to collect data on previously planted sites carried out in December 2019.</p> <p>98 members (68 women) of the 8 community nurseries have received incomes from seedling purchase for use in hedge planting activities.</p> <p>175 community members (103 women) have been trained to plant and manage Mulanje Cedar hedges in preparation for the essence oil industry.</p> <p>The socio-economic baseline survey completed that will be repeatable at end of project to identify benefits to local communities</p>	
<p>Outcome Communities living around Mount Mulanje receive short-term benefits from sustainable utilisation of Mulanje Cedar and opportunities are identified for sustainable commercial use of other over-exploited plant species of Mount Mulanje</p>	<p>0.1 Restoration protocols developed for Mulanje Cedar on Mount Mulanje improve survival rates by 30% compared to project 23-026 baseline, resulting in continued demand for seedlings for restoration.</p> <p>0.2 Documented example of the conservation-commerce model for Mulanje Cedar developed by end of year 3.</p> <p>0.3 Optimal extraction techniques identified for Mulanje Cedar essence by end of year 1 and essential oil</p>	<p>0.1</p> <p>Initial draft for restoration trial design has been written by with support from ERA experts.</p> <p>0.2</p> <p>Reports from the marketing and use feasibility study and Nagoya Protocol workshop have been published which will contribute to final Conservation-Commerce model project methodology.</p> <p>Report from initial socio-economic survey drafted describing the current</p>	<p>0.1</p> <p>Finalise restoration trial designs by September</p> <p>Plant restoration trials in December with baseline data collected.</p> <p>0.2 and 0.3</p> <p>Essential oil compositional analysis report published in May</p> <p>Sign NDA with potential purchasers of Mulanje Cedar oil.</p>

	<p>produced and sold by communities, resulting in benefits for 150 local community members (60% women) and a market for Mulanje Cedar seedlings for essence extraction by end of year 3.</p> <p>0.4 Over-exploited plant species of Mount Mulanje are investigated for potential sustainable use by end of year 3.</p>	<p>socio-economic situation of communities around Mulanje Mountain.</p> <p>0.3</p> <p>The initial feasibility study defined the protocols for essential oils analysis which the Mzuzu University essential oil research consultant used to complete lab research.</p> <p>175 community members received the nursery planting and management training.</p> <p>The Nagoya Protocol workshop was undertaken in January 2020. The workshop draft report has been published.</p> <p>85 hedges have been planted at 9 sites.</p> <p>0.4</p> <p>A list of 19 other species has been collated that have potential economic development value.</p>	<p>Send essential oil samples to potential purchasers.</p> <p>Investigate sustainable harvest regimes of leaves from hedges and calculate number of hedges needed for any sustainable oil industry.</p> <p>Train 175 community members to sustainable harvest Mulanje Cedar, and in business and marketing skills.</p> <p>Incorporate hedge growers into the Cedar Growers and Planters Association (CGPA).</p> <p>0.4</p> <p>Complete ethnobotany survey to Investigate local plant resources use.</p> <p>Investigate resource extent and exploitation of potential target species to identify target.</p> <p>Collect seed of target list for storage at FRIM and <i>ex situ</i> living collections in Botanic Gardens.</p> <p>Start propagation trials of target list at community nurseries to create localised propagation protocol.</p>
<p>Output 1. Improved restoration protocols developed for Mulanje Cedar on Mount Mulanje, resulting in continued demand for seedlings for restoration</p>	<p>1.1 Ten nurseries, established and certified in project 23-026, continue to produce a minimum aggregate total of 400,000 Mulanje Cedar seedlings in years 1, 2 and 3 (seedling production figures have not increased compared to project 23-026 due to limited seed availability) for restoration, commercial sales (timber and essence) and community cedar hedge plantations (output 3), benefiting 150 community nursery workers.</p> <p>1.2 FRIM and restoration experts from BGC's network design and implement</p>	<p><i>(Report general progress against indicators, comment on their appropriateness, and reference where evidence is provided e.g. Evidence provided in section 3.2 of report and Annex X)</i></p> <p>1.1</p> <p>Nursery propagation and sales figures are in section 3 in table 1.</p> <p>1.2</p> <p>FRIM and restoration experts attended fieldwork and a workshop to design restoration trials in September 2019. Post workshop communications have contributed to an initial draft of the trial designs with appendices for with information on companion species and variables to monitor. Report and appendices provided as evidence in sections 2 and 3.1, and Annex 4.</p> <p>1.3 and 1.4</p>	

	<p>planting trials at 8 sites on Mount Mulanje by end of year 1, benefiting 80 additional community members employed to transport and plant seedlings on Mount Mulanje.</p> <p>1.3 Improved planting protocols for Mulanje Cedar developed by FRIM and restoration experts in BGCI's network by end of year 3.</p> <p>1.4 Mulanje Cedar seedling establishment and survival rates increased throughout life of the project (target 30% improvement against baseline by end of project 23-026).</p>	Trials and baseline data to be collected in December 2020.	
Activity 1.1 Ten nurseries, established and certified in project 23-026, produce a minimum aggregate total of 400,000 Mulanje Cedar seedlings in years 1-3, benefiting 150 nursery workers.		<p>(Report completed or progress on activities that contribute toward achieving this Output)</p> <p>75,700 seedlings were propagated this year in 8 nurseries. The community members of the nurseries have received £9,620.</p>	<p>(Outline what will be carried out in the next period)</p> <p>FRIM will provide seeds to nurseries to continue to propagate seedlings for restoration trial establishment.</p>
Activity 1.2 a) Design and implement planting trials at 8 sites on Mount Mulanje by end of year 1, benefiting people employed to transport and plant seedlings.		Restoration trial design workshop held in September 2019.	Restoration trial design to be finalised with the trials planted in December 2020.
Activity 1.2 b) FRIM and restoration experts from BGCI's network monitor planting trials in years 1, 2 and 3.		Fieldwork to collect data from previously planted sites completed in December 2019.	Baseline data for the restoration trials will be collected in December 2019.
Activity 1.3 FRIM and restoration experts from BGCI's network publish improved restoration protocols for Mulanje Cedar by end of year 3.			To be published following data collection and analysis in the final year of the project.
Activity 1.4 Publish a review of survival rate improvements (target 30% improvement from Darwin project 23-026 baseline) by end of year 3.			To be published following data collection and analysis in the final year of the project.
Output 2. Conservation-commerce model developed and documented for Mulanje Cedar	2.1 Expert consultants appointed and project steering committee established by end of year 1, to guide and monitor project progress and development of conservation-commerce model.	2.1	6 expert consultants have contributed to the project with the contracts in section 3.1 and Annex 6.

	<p>2.2 Feasibility study commissioned to improve understanding of Mulanje Cedar potential uses and markets, including identification of local and international commercial partners and quantifying potential income from essence manufacture, complete by end of year 1.</p> <p>2.3 Workshop held in year 1 involving the Union for Ethical BioTrade and TRAFFIC to determine Nagoya Protocol implications and requirements regarding access and benefit sharing in preparation for international trade of certified essence product and assess whether wild harvesting might be appropriate in future. Potential international purchasers engaged in years 2 and 3.</p> <p>2.4 Public outreach campaign in years 2 and 3 to grow demand for purchase of Mulanje Cedar seedlings (for timber and essence extraction) and essential oil.</p> <p>2.5 MMCT and FRIM monitor nursery certification scheme and Cedar Growers and Planters Association (CGPA) established in project 23-036, which becomes fully inclusive of planters for essence extraction by end of year 3.</p> <p>2.6 Training delivered in business and marketing skills and Nagoya compliance to Mulanje Cedar essence producers in year 2.</p> <p>2.7 Model conservation-commerce project for Mulanje Cedar documented and published by end of year 3.</p>	<p>The steering committee was established in July 2019. Evidence is provide in the meeting minutes, participant list and presentation slide in Annex 1.</p> <p>2.2</p> <p>The feasibility study was published in November 2019. Evidence is provided in section 3.1 and Annex 7.</p> <p>2.3</p> <p>The Nagoya Protocol workshop was undertaken in January 2020. The first draft of the workshop report is evidences in section 5 and Annex 8.</p> <p>2.4</p> <p>Public outreach to be undertaken in years 2 and 3.</p> <p>2.5</p> <p>FRIM monitored the nurseries. Two were certified and advice was provided on what the other project nurseries need to do to improve and get certified. This is evidenced in section 3.1 and Annex 9.</p> <p>2.6</p> <p>This is to be undertaken in the project second year.</p> <p>2.7</p> <p>The conservation-commerce model example of Mulanje Cedar Essential Oil analysis has progressed with a feasibility study (evidenced in Annex 7), application for essential oils analysis (Evidenced in section 3.1 and Annex 10), Nagoya Protocol workshop (report evidence in Annex 8). These will contribute to the model to be published at the end of the project.</p>
<p>Activity 2.1.a) Write contracts for consultants by end of year 1.</p>		<p>6 contracts negotiated and signed for the project work in the first year</p> <p>A business skills consultant contract will be negotiated and developed for</p>

		community recipient business and market skills management training.
Activity 2.1. b) Establish project steering committee to guide and monitor project progress and development of conservation-commerce model.	Project steering committee meeting was held in July 2019.	A second project steering committee will take place in September, as long as the corona virus pandemic is no longer restricting global activities.
Activity 2.2. Commission study to improve understanding of Mulanje Cedar potential uses and markets, identify commercial partners and quantify potential income, complete by end of year 1.	Completed	
Activity 2.3. Workshop involving UEBT and TRAFFIC, determining Nagoya Protocol implications and ABS requirements for international oil trade, assessing whether wild harvesting might be appropriate in future.	Completed	
Activity 2.4. Run a public outreach campaign in years 2 and 3 to grow demand for purchase of Mulanje Cedar seedlings for timber and essence extraction.		Once the evidence for an industry is confirmed through research results and engagement with businesses and outreach campaign will be run.
Activity 2.5. MMCT and FRIM monitor nursery certification scheme and CGPA (established in project 23-036) which becomes fully inclusive of planters for essence extraction by year 3.	2 nurseries certified in August 2019 and support given by FD and MMCT to improve standards of the remaining 6 nurseries.	Certification to be carried out by FRIM again this year.
Activity 2.6. Provide training in Nagoya compliance to Mulanje Cedar essence producers in year 2.		Training to be undertaken once business is confirmed.
Activity 2.7. Model conservation-commerce project for Mulanje Cedar documented and published by end of year 3.		
<p>Output 3. Manufacture of products from sustainably sourced Mulanje Cedar essence generates income for additional local households in the short-term and results in a larger market for cedar seedlings.</p>	<p>3.1 Optimal sustainable extraction techniques for Mulanje Cedar essence are identified in year 1.</p> <p>3.2 Samples sent to potential national and international purchasers by end of year 1, with continued engagement in years 2 and 3.</p> <p>3.3 150 people (60% women) from ten communities around Mount Mulanje are identified with help from Traditional Authorities, and ten trial cedar hedge plantations are planted at sites around the base of Mount Mulanje for essential oil extraction by end of year 1 and ten</p>	<p>3.1</p> <p>The fieldwork and lab research has been undertaken for the identification of optimal sustainable extraction technique. Evidence is in Annex 10 – application form to NCST. The report is due to be published in early May.</p> <p>5 relevant NDAs have been signed between MMCT and BGGI, FRIM, Arthur Stevens (Mulanje Cedar use and marketing feasibility survey consultant), EDE (potential Still provider) and Mzuzu University. Evidence in section 2 and Annex 3.</p> <p>3.2</p> <p>With essential oil composition not yet published, samples have not yet been sent to potential purchasers. This will be done when the report is published to understand what industries the essential oils from Mulanje Cedar could fit into.</p>

	<p>community cedar essence extraction enterprises fully equipped at start of year 2.</p> <p>3.4 150 people (60% women) from ten communities around Mount Mulanje are trained in planting and management techniques for cedar hedge plantations by end of year 1, sustainable harvesting techniques, processing, business skills and marketing.</p> <p>3.5 150 people selling essential oil and earning at least USD250/year from sale of Mulanje Cedar essential oil by end of year 3.</p>	<p>Delays are described in section. Evidence for decisions to deal with delays are evidenced in section 2 and Annex 2 change request information.</p> <p>3.3</p> <p>175 people (103 women) were identified to plant and manage Mulanje Cedar hedges.</p> <p>3.4</p> <p>175 people (103 women) were trained to plant and manage Mulanje Cedar hedges across two training dates in February and March 2020.</p> <p>3.5</p> <p>The socio-economic survey draft report was published. Evidence in section 3.1 and Annex 11.</p>	
<p>Activity 3.1. Identify optimal sustainable extraction techniques for Mulanje Cedar essence by end of year 1.</p>	<p>Fieldwork and research completed. Evidence in section 3.1 and Annex 15.</p>	<p>Report to be published in May 2020.</p>	
<p>Activity 3.2. a) Send samples to potential national and international purchasers by end of year 1.</p>	<p>Delayed due to project start delays and resulting delays to essential oil research.</p>	<p>Samples to be sent in May/June 2020 following signing of NDAs.</p>	
<p>Activity 3.2. b) Continue to engage potential purchasers to expand markets in years 2 and 3</p>		<p>This will be continued throughout the year.</p>	
<p>Activity 3.3. a) Work with Traditional Authorities in year 1 to identify 150 people (60% women) from ten communities around Mount Mulanje to form essence extraction enterprises.</p>	<p>Completed</p>		
<p>Activity 3.3. b) Communities plant ten trial cedar hedge plantations using established seedlings at sites around the base of Mount Mulanje by end of year 1.</p>	<p>Completed</p>		
<p>Activity 3.3. c) Equip communities with essence extraction equipment at start of year 2.</p>	<p>Still producer from South Africa engaged and quote given.</p>	<p>To purchase still once business opportunities have been identified in June/July 2020</p>	
<p>Activity 3.4. a) Train 150 people (60% women) in planting and management techniques for cedar hedge plantations by end of year 1.</p>	<p>Completed</p>		
<p>Activity 3.4. b) Train 150 people (60% women) in sustainable harvesting techniques and processing, business skills and marketing by end of year 2.</p>		<p>Sustainable harvesting techniques will be taught once this is understood following research publication.</p>	

		Business skills and marketing training will be carried out in July 2020
Activity 3.5. a) Essential oil sold to commercial buyers for product manufacturing in years 2 and 3.		
Activity 3.5. b) Carry out socio-economic study in years 1 and 3 to monitor income obtained by essence extraction enterprises.	First year socio-economic survey has been completed and draft report submitted to the team.	Socio-economic survey report will be improved and published by June 2020
<p>Output 4. Conservation measures in place for other over-exploited plant species on Mount Mulanje and conservation-commerce model replicated for five important plant species on Mount Mulanje.</p>	<p>4.1 Survey conducted to identify other plant species of Mount Mulanje and their potential uses and commercial value in year 1.</p> <p>4.2 Seed collected from all over-exploited rare and threatened plant species on Mount Mulanje (estimated 10 additional species) in years 1 and 2, stored at FRIM and distributed to at least ten botanic gardens for ex situ conservation.</p> <p>4.3 Propagation protocols developed by FRIM, tested by community nurseries and published for all collected species by end of year 3.</p> <p>4.4 Pilot studies for at least 3 other over-exploited plant species with commercial potential on Mount Mulanje, diversifying income streams by end of year 3 and helping ensure the conservation of those species. Candidate enterprises include propagation of <i>Kniphofia mulanjeana</i> and <i>Encephalartos gratus</i> (Vulnerable) for sale as ornamental plants (matched funding dependent).</p>	<p>4.1 Ethnobotanical survey has been commissioned with a contract signed, a proposal submitted to NCST with data collection tools and PIC and MAT agreements drafted. Evidence in section 3.1 and Annexes 6, 12 and 13. The survey itself has been delayed due to the coronavirus outbreak.</p> <p>4.2 Potential species have been identified in the Mulanje Cedar essential oil feasibility study report and at the Nagoya Protocol workshop. Evidence for these is in Annexes 7 and 8.</p> <p>4.3 Collections and propagation protocols to be done in the remaining project years.</p> <p>4.4 Pilot studies to be established in the final project year.</p>
Activity 4.1. Conduct survey to identify other plant species of Mount Mulanje and their potential uses and commercial value in year 2.	Study has been commissioned but delayed due to coronavirus outbreak.	Ethnobotanical study with communities will take place in May-June 2020 with a report published in July 2020.
Activity 4.2. Seed collected from est. 10 additional over-exploited species in years 1 and 2, stored at FRIM and distributed to at least ten botanic gardens.	Species have not yet been identified for seed collection.	The target list will be finalised following the ethnobotany study in August 2020

		with seed collection starting following this.
Activity 4.3. FRIM develop propagation protocols, communities test protocols and publish protocols for all species by end of year 3.		Propagation trials will take place once seed are collected, to publish new protocols in the final year.
Activity 4.4. Develop sustainable small enterprises pilot studies for at least 3 other over-exploited plant species with commercial potential.		This will be undertaken in the project's final year.

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed)

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Impact: The Mulanje cedar is a sustainably managed commercial product, generating income for local households and the Malawian economy, and no longer threatened in the wild..</p>			
<p>Outcome: Communities living around Mount Mulanje receive short-term benefits from sustainable utilisation of Mulanje Cedar and opportunities are identified for sustainable commercial use of other over-exploited plant species of Mount Mulanje</p>	<p>0.1 Restoration protocols developed for Mulanje Cedar on Mount Mulanje improve survival rates by 30% compared to project 23-026 baseline, resulting in continued demand for seedlings for restoration.</p> <p>0.2 Documented example of the conservation-commerce model for Mulanje Cedar developed by end of year 3.</p> <p>0.3 Optimal extraction techniques identified for Mulanje Cedar essence by end of year 1 and essential oil produced and sold by communities, resulting in benefits for 150 local community members (60% women) and a market for Mulanje Cedar seedlings for essence extraction by end of year 3.</p> <p>0.4 Over-exploited plant species of Mount Mulanje are investigated for potential sustainable use by end of year 3.</p>	<p>0.1 Planting protocols published. Seedling survival rates. Records of seedling sales from nurseries.</p> <p>0.2 Written record of model project methodology.</p> <p>0.3 Extraction methods published. Training course attendance figures and certificates. Socio-economic survey reports. Essence producers sales figures. Records of seedling sales.</p> <p>0.4 Seed collection and ex situ collection records. Mount Mulanje annual report and accounts. Funding applications.</p>	<ul style="list-style-type: none"> • Continued participation of local communities. • Local politics and ethnic differences do not hinder progress of project activities. • Income obtained from seedlings and essential oil replaces income from illegal exploitation activities and is regarded as an alternative, not an additional activity. • Technical expertise is available to solve planting issues.
<p>Output 1 Improved restoration protocols developed for Mulanje Cedar on Mount Mulanje, resulting in continued demand for seedlings for restoration</p>	<p>1.1 Ten nurseries, established and certified in project 23-026, continue to produce a minimum aggregate total of 400,000 Mulanje Cedar seedlings in years 1, 2 and 3 (seedling production figures have not increased compared to project 23-026 due to limited seed availability) for restoration, commercial sales (timber and essence) and community cedar hedge plantations (output 3),</p>	<p>1.1. Nursery sales records. Register of commercial planting sites.</p> <p>1.2 Trial plot records.</p> <p>1.3 Planting leaflets.</p> <p>1.4 Planting and survival figures, MMCT annual report.</p>	<ul style="list-style-type: none"> • Enough seed is produced from FRIM stands to continue to supply nurseries with sufficient seed. • Communities continue to be interested in nursery work. • Restoration and commercial market for seedlings is maintained.

	<p>benefiting 150 community nursery workers.</p> <p>1.2 FRIM and restoration experts from BGCI's network design and implement planting trials at 8 sites on Mount Mulanje by end of year 1, benefiting 80 additional community members employed to transport and plant seedlings on Mount Mulanje.</p> <p>1.3 Improved planting protocols for Mulanje Cedar developed by FRIM and restoration experts in BGCI's network by end of year 3.</p> <p>1.4 Mulanje Cedar seedling establishment and survival rates increased throughout life of the project (target 30% improvement against baseline by end of project 23-026).</p>		
<p>Output 2</p> <p>Conservation-commerce model developed and documented for Mulanje Cedar</p>	<p>2.1 Expert consultants appointed and project steering committee established by end of year 1, to guide and monitor project progress and development of conservation-commerce model.</p> <p>2.2 Feasibility study commissioned to improve understanding of Mulanje Cedar potential uses and markets, including identification of local and international commercial partners and quantifying potential income from essence manufacture, complete by end of year 1.</p> <p>2.3 Workshop held in year 1 involving the Union for Ethical BioTrade and TRAFFIC to determine Nagoya Protocol implications and</p>	<p>2.1 Steering Committee minutes. Consultant contracts. Monitoring and evaluation reports.</p> <p>2.2 Published feasibility study.</p> <p>2.3 Minutes and guidance produced from workshop.</p> <p>2.4 Leaflets, newspaper articles, radio and TV shows.</p> <p>2.5 Nursery certification register. CGPA register. Essential oil producer certification scheme developed and certification register.</p> <p>2.6 Training course attendance figures and certificates.</p> <p>2.7 Published report.</p>	<ul style="list-style-type: none"> • Malawians will continue to respond to public outreach campaign. • Local politics and ethnic differences not inimical to creating a cohesive and representative essence producer association

	<p>requirements regarding access and benefit sharing in preparation for international trade of certified essence product and assess whether wild harvesting might be appropriate in future. Potential international purchasers engaged in years 2 and 3.</p> <p>2.4 Public outreach campaign in years 2 and 3 to grow demand for purchase of Mulanje Cedar seedlings (for timber and essence extraction) and essential oil.</p> <p>2.5 MMCT and FRIM monitor nursery certification scheme and Cedar Growers and Planters Association (CGPA) established in project 23-036, which becomes fully inclusive of planters for essence extraction by end of year 3.</p> <p>2.6 Training delivered in business and marketing skills and Nagoya compliance to Mulanje Cedar essence producers in year 2</p> <p>2.7 Model conservation-commerce project for Mulanje Cedar documented and published by end of year 3.</p>		
<p>Output 3</p> <p>Manufacture of products from sustainably sourced Mulanje Cedar essence generates income for additional local households in the short-term and results in a larger market for cedar seedlings.</p>	<p>3.1 Optimal sustainable extraction techniques for Mulanje Cedar essence are identified in year 1.</p> <p>3.2 Samples sent to potential national and international purchasers by end of year 1, with continued engagement in years 2 and 3.</p> <p>3.3 150 people (60% women) from ten communities around Mount Mulanje</p>	<p>3.1. Scientific papers. Manuals for extraction.</p> <p>3.2 Partnerships with national and international purchasers.</p> <p>3.3 Essence enterprise member records. Cedar hedge plantations in place. Equipment and consumables in place.</p>	<ul style="list-style-type: none"> • Expertise is available to optimise extraction techniques and develop essence products. • Communities are receptive to new business establishment.

	<p>are identified with help from Traditional Authorities, and ten trial cedar hedge plantations are planted at sites around the base of Mount Mulanje for essential oil extraction by end of year 1 and ten community cedar essence extraction enterprises fully equipped at start of year 2.</p> <p>3.4 150 people (60% women) from ten communities around Mount Mulanje are trained in planting and management techniques for cedar hedge plantations by end of year 1, sustainable harvesting techniques, processing, business skills and marketing.</p> <p>3.5 150 people selling essential oil and earning at least USD250/year from sale of Mulanje Cedar essential oil by end of year 3.</p>	<p>3.4 Training course attendance records and certificates.</p> <p>3.5 Sales records. Socio-economic surveys.</p>	
<p>Output 4</p> <p>Conservation measures in place for other over-exploited plant species on Mount Mulanje and conservation-commerce model replicated for five important plant species on Mount Mulanje.</p>	<p>4.1 Survey conducted to identify other plant species of Mount Mulanje and their potential uses and commercial value in year 1.</p> <p>4.2 Seed collected from all over-exploited rare and threatened plant species on Mount Mulanje (estimated 10 additional species) in years 1 and 2, stored at FRIM and distributed to at least ten botanic gardens for ex situ conservation.</p> <p>4.3 Propagation protocols developed by FRIM, tested by community nurseries and published for all collected species by end of year 3.</p> <p>4.4 Pilot studies for at least 3 other over-exploited plant species with commercial potential on Mount</p>	<p>4.1 Survey report.</p> <p>4.2 Data capture forms from seed collection. FRIM records. Material Transfer Agreements. BGCI's PlantSearch database of ex situ collections.</p> <p>4.3 Published protocols.</p> <p>4.4 Enterprise model project concepts and funding applications.</p>	<ul style="list-style-type: none"> • Seed is available for collection from target species within the project timeframe.

	<p>Mulanje, diversifying income streams by end of year 3 and helping ensure the conservation of those species. Candidate enterprises include propagation of Kniphofia mulanjeana and Encephalartos gratus (Vulnerable) for sale as ornamental plants (matched funding dependent).</p>		
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Activities (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)

Output 1

- 1.1 Ten nurseries, established and certified in project 23-026, produce a minimum aggregate total of 400,000 Mulanje Cedar seedlings in years 1-3, benefiting 150 nursery workers.
- 1.2 Design and implement planting trials at 8 sites on Mount Mulanje by end of year 1, benefiting people employed to transport and plant seedlings.
- 1.2 FRIM and restoration experts from BGCI's network monitor planting trials in years 1, 2 and 3.
- 1.3 FRIM and restoration experts from BGCI's network publish improved restoration protocols for Mulanje Cedar by end of year 3.
- 1.4 Publish a review of survival rate improvements (target 30% improvement from Darwin project 23-026 baseline) by end of year 3.

Output 2

- 2.1 Write contracts for consultants by end of year 1.
- 2.1 Establish project steering committee to guide and monitor project progress and development of conservation-commerce model.
- 2.2 Commission study to improve understanding of Mulanje Cedar potential uses and markets, identify commercial partners and quantify potential income, complete by end of year 1.
- 2.3 Workshop involving UEBT and TRAFFIC, determining Nagoya Protocol implications and ABS requirements for international oil trade, assessing whether wild harvesting might be appropriate in future.
- 2.4 Run a public outreach campaign in years 2 and 3 to grow demand for purchase of Mulanje Cedar seedlings for timber and essence extraction.
- 2.5 MMCT and FRIM monitor nursery certification scheme and CGPA (established in project 23-036) which becomes fully inclusive of planters for essence extraction by year 3.
- 2.6 Provide training in Nagoya compliance to Mulanje Cedar essence producers in year 2.
- 2.7 Model conservation-commerce project for Mulanje Cedar documented and published by end of year 3.

Output 3

- 3.1 Identify optimal sustainable extraction techniques for Mulanje Cedar essence by end of year 1.
- 3.2 Send samples to potential national and international purchasers by end of year 1.
- 3.2 Continue to engage potential purchasers to expand markets in years 2 and 3
- 3.3 Work with Traditional Authorities in year 1 to identify 150 people (60% women) from ten communities around Mount Mulanje to form essence extraction enterprises.
- 3.3 Communities plant ten trial cedar hedge plantations using established seedlings at sites around the base of Mount Mulanje by end of year 1.
- 3.3 Equip communities with essence extraction equipment at start of year 2.
- 3.4 Train 150 people (60% women) in planting and management techniques for cedar hedge plantations by end of year 1.
- 3.4 Train 150 people (60% women) in sustainable harvesting techniques and processing, business skills and marketing by end of year 2.
- 3.5 Essential oil sold to commercial buyers for product manufacturing in years 2 and 3.

3.5 Carry out socio-economic study in years 1 and 3 to monitor income obtained by essence extraction enterprises.

Output 4

4.1 Conduct survey to identify other plant species of Mount Mulanje and their potential uses and commercial value in year 2.

4.2 Seed collected from est. 10 additional over-exploited species in years 1 and 2, stored at FRIM and distributed to at least ten botanic gardens.

4.3 FRIM develop propagation protocols, communities test protocols and publish protocols for all species by end of year 3.

4.4 Develop sustainable small enterprises pilot studies for at least 3 other over-exploited plant species with commercial potential.

Annex 3: Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
Established codes								
6A	Local community members received training in how to plant and manage hedges, sustainably harvest and business and marketing skills	103 women	Malawian	168				150
7	Manual for sustainable harvesting of Mulanje Cedar Hedges			0				1
11B	Scientific papers on essential oil analysis and restoration experimentation submitted for publication			0				2
13A	Seed and Ex situ collections made for overexploited socio-economic plant species from Mulanje Mountain			0				0
14B	Project progress to be presented at the AETFAT conference (Sept. 2020)			0				0
20	Essential oil Distillation machinery to be provided			0				0
22	Permanent restoration monitoring sites (of previous			5				5

	planted areas and newly planted sites)							
23	Belvedere Trust funds for updating Mulanje Mountain radio system							

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)

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

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	√
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	√
Do you have hard copies of material you want to submit with the report? 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.	
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.	