





Darwin Initiative: Final Report

To be completed with reference to the "Writing a Darwin/IWT Report" Information Note: (https://www.darwininitiative.org.uk/resources-for-projects/reporting-forms-change-request-forms-and-terms-and-conditions/).

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

Darwin Project Information

Project reference	24-025
Project title	Community reforestation for biodiversity, livelihood diversification and culture
Country(ies)	East Timor
Lead organisation	Charles Sturt University
Partner institution(s)	Group Training Northern Territory (GTNT) and Fundaceo Carbon Offsets Timor Leste (FCOTI)
	World Vision Timor-Leste
	RAEBIA
	Australian Landcare International
Darwin grant value	£309,182
Start/end dates of project	1/04/2017 to 31/03/2021
Project leader's name	Dr Joanne Millar
Project website/blog/social media	https://communityreforestationtimorleste.wordpress.com
Report author(s) and date	Joanne Millar, Alex Sarmento, Jorge Ramos, Jennifer Bond

1 Project Summary

The project addressed forest decline, biodiversity loss, land degradation and agricultural livelihoods in Laclubar and Soibada administrative-posts of Manatuto municipality in Timor-Leste (T-L) (Figure 1). Forest decline from clearing, fire and grazing in Manatuto municipality has led to habitat fragmentation and soil erosion. Timor Leste is one of the poorest countries in Southeast Asia (T-L NAPA, 2010) with household income at less than US\$1,000 per year or \$2.70 per day (Bond et al. 2020). The project facilitated an increase in community led reforestation, ecosystem rehabilitation and agroforestry by project partners GTNT and FCOTI who have been paying farmers annually for all planted and surviving trees. The payments are not sustainable as it relies on donations, so the project was designed to achieve carbon accreditation to provide more stable, long term income for 100 households, and encourage ongoing reforestation. The aim was to integrate agroforestry, farmer managed natural regeneration (FMNR), biodiversity conservation and livelihood diversification through an internationally recognised carbon accreditation scheme. The anticipated outcome was increased forest cover, increased and stable household income, livelihood improvements and diversification, biodiversity information and increased awareness of biodiversity in the area.

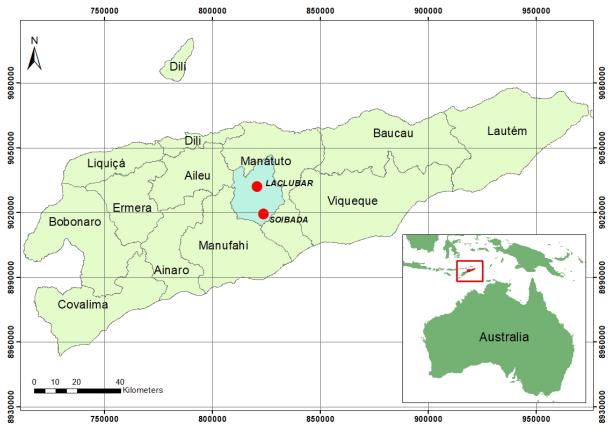


Figure 1 Project Location

- National Adaptation Programme of Action (NAPA) on Climate Change, (2010). Ministry for Economy and Development and Secretary
- Bond, J., Millar, J. and Ramos, J. (2020) Livelihood benefits and challenges of community reforestation in Timor Leste: implications for smallholder carbon forestry schemes, *Forests, Trees and Livelihoods*, 29:3, 187-204, DOI: 10.1080/14728028.2020.1798817

2 Project Partnerships

A strong partnership developed during the project between CSU as lead organisation based in Albury, Australia, project partners Group Training Northern Territory (GTNT) based in Darwin, Australia and associated Dili based NGO, Fundação Carbon Offsets Timor-Leste (FCOTI). Project planning and decision making was carried out by the whole project team on an as needs basis with regular communication via email, whatsapp, skype and visits to Timor Leste. FCOTI implemented the activities in country and managed the field staff and operating budget. CSU managed the Darwin Funds, implemented forest and social research. GTNT sent funds to FCOTI. FCOTI sent quarterly reports to GTNT and CSU. CSU maintained the website with regular blog stories (https://communityreforestationtimorleste.wordpress.com). FCOTI has also developed its own website for carbon credit sales (https://www.carbonoffsettimor.com/). This Final Report was prepared by CSU with input from FCOTI staff.

Local minor partners included World Vision Timor Leste who provided training in Farmer Managed Natural Regeneration (FMNR) in the first and second years, RAEBIA provided training in conservation farming in the first year, and Conservation International were informal partners that provided biodiversity monitoring and training in the second year (see stories at https://communityreforestationtimorleste.wordpress.com). Local communities participated in regular FCOTI meetings, farmer training in tree planting/management, women's business training and survey interviews. Government agencies became involved with FCOTI during the project including the Ministry of Agriculture and Fisheries, and Secretary of State for the Environment with signing of an MOU. FCOTI has developed a prominent profile in Timor Leste's Climate Change Policy Development. CSU continues to maintain a relationship with FCOTI, assisting with grant applications, carbon marketing and forest research advice.

3 Project Achievements

3.1 Outputs

Output 1 Expansion of tree plantations and agroforestry development

1.1: 100 Hectares (ha) planted including 20 ha under an agroforestry system by end of Yr 4.

The total area planted is 120 hectares from a baseline area of 41ha in 2016-2017 (Figure 2). Therefore we have reached more than the target of 100 hectares. The area under agroforestry is 32 ha surpassing the output indicator of 20ha. Using GPS and GIS methods proved reliable for calculating land areas, and field staff counted every tree for the project database. Plantation areas range from 0.02 to 3.63ha with average of 0.58ha. Total trees planted during the Darwin project period was 169,178 including 27,254 trees planted in 2021 (FCOTI Quarterly Report March 2021). The smaller area planted in 2021 is because Darwin funding finished in 2020. There was some loss of trees due to landslides in March 2021 (as anticipated in assumptions). Nineteen sites were affected and 1149 trees damaged. These areas will be replanted in 2022 by FCOTI.

[Note: The area included in the Halo Verde Carbon Certification Project is 75 ha over 151 sites, with direct participation of 115 households benefiting more than 600 people as calculated in 2019. Recent additions may be included in future carbon assessments]

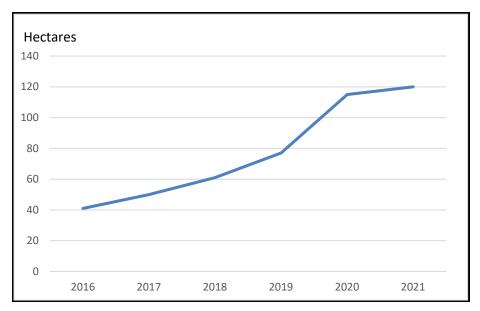


Figure 2 Increase in tree plantation area over project period (project database)



Farmer planting mahogany with field staff

Mahogany plantation

1.2: 70% tree survival rate achieved after 1st year of new planting establishment.

An 80% tree survival rate indicator was achieved in 2018 from an estimated baseline survival rate of 52% in 2015 (Figure 3). Survival rates were not recorded in 2016 and 2017 due to lack of resources before project got underway. Survival rates in 2019 and 2020 were lower (55% and 60% respectively) due to drought and some livestock damage. Annual tree and survival counts were measured by farmers and verified by the field staff as part of the carbon certification process (Halo Verde PDD 2019). Better survival rates were achieved through farmer training and onsite visits to improve site and species selection, watering and weeding. See story https://communityreforestationtimorleste.wordpress.com/2018/10/12/farmer-field-day-land-use-planning-and-tree-planting/)

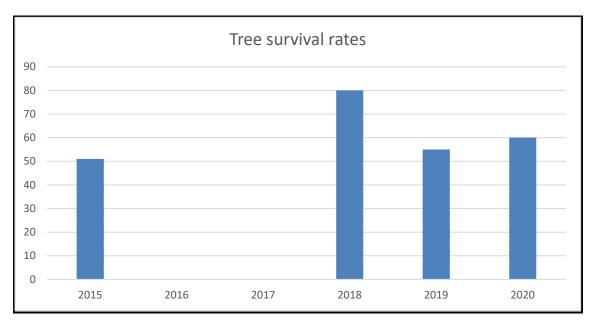


Figure 3 Survival rates of planted trees (project database)

Figure 4 shows that most households interviewed in the final survey learnt skills in site selection and tree planting but less households reported learning about how to protect trees, indicating that follow up training in tree management is needed.

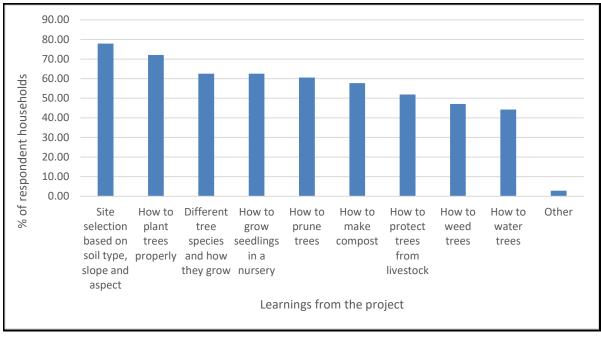


Figure 4 Key learnings from farmer training and onground works (final survey data 2021)

1.3: <u>100 households participating in tree planting and maintenance with *Tara Bandu* in place by end of Yr 4</u>

The target of 100 households participating in the project with tree plantations was surpassed with 146 households now involved in the project from a 2017 baseline of 66 households (Figure 4). Farmer registration and planting records were the best means of verification. A *Tara Bandu* traditional law was introduced at the start of the project in conjunction with village leaders to encourage participants to plant trees and protect from grazing or burning.

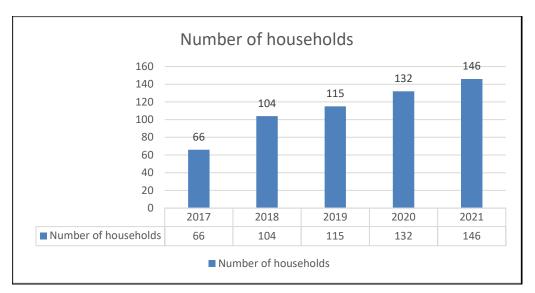


Figure 4 Number of households participating in the project (project database)

1.4 15% increase in household income from agroforestry by end of Yr 4

Most plantations grow timber species only, but 30% are also used for growing annual or perennial understorey crops such as fruit, vegetables, maize and coffee. These crops are used for cash income and consumption. Thinnings and prunings are used for firewood. The final household survey conducted in February 2021 asked 109 participants to estimate whether income from plantation agroforestry products had changed, and by how much. Table 1 shows that 40% of respondents experienced an increase in income, 31% had no change and 21% did not have any income from their plantations yet. Only 4% had experienced a decrease in income, possible due to loss of trees or cessation of growing understorey crops. Crops are grown on a rotational basis and mostly in plantations that are close to the village or house.

Table 1 Estimated change in income from agroforestry products	(2017	to 2021)
---	-------	----------

	Frequency	% of HHs that responded	% of total households
Increased	44	41.90	40.37
Decreased	4	3.81	3.67
No change	34	32.38	31.19
No income	23	21.90	21.10
Total	105		

As anticipated in the logframe, Table 2 shows that most of the 44 households had an income increase up to 25% from selling agroforestry products. This is commensurate with our target of 15% and is conservative because of the low price of fruit and vegetables in local markets, and most products being consumed by households (important for nutrition). Coffee production is lower in tree plantations due to root competition but a valuable crop nevertheless. Six households said they had more than 50% increase in income from their agroforestry plantations, possibly from growing higher value crops such as pineapple or papaya. A third of respondents could not estimate % increase in income from agroforestry.

Table 2 Estimated percentage income increase from agroforestry products

	Frequency	% of respondents
Up to 25%	23	52.27
Around 30%	2	4.55
Around 50%	2	4.55
Around 60%	3	6.82
Around 100%	1	2.27
Don't know	13	29.55
Total	44	100.00

Output 2 Establishment of farmer managed natural regeneration (FMNR) in eroded areas

2.1 5 ha of low fertility land undergoing FMNR by end of Yr 4.

A total of 5 hectares of land is being managed under FMNR by four farmers as measured by GPS. FMNR requires farmers to have areas of natural forest and be prepared to devote labour and time to using the techniques. Hence a limited number of farmers were able to adopt the practice despite on-site training for 17 farmers and a visit to Aileu district by 21 farmers (7 women, 14 men) and 5 project staff where farmers have been practicing FMNR for several years (https://communityreforestationtimorleste.wordpress.com/2018/01/09/farmers-learn-about-fmnr-from-world-vision-and-aileu-farmers/)

*Note that FMNR areas were not included in carbon certification as they are not planted trees.

2.3 50% improvement in farmer's forest management skills including sustainable harvesting by end of Yr 4

The four farmers who implemented FMNR in 2018 on their eucalypt plantations were invited to a follow up 3 day workshop from 4-6 February 2020 organized and sponsored by World Vision Timor-Leste. The workshop included one day of field exposure to Aileu Municipality (see Annex 7.1). FCOTI was also invited by World Vision to make a presentation on carbon offset farming in the workshop. The four farmers from Laclubar and Soibada had a great opportunity to interact with farmers from other municipalities on how FMNR has been done in other locations in Timor-Leste. In the final survey, three of the four farmers were available for interview. Of the 3 farmers interviewed in the final survey, two said there forest management skills had very highly improved (66.7%) and they had observed a highly significant improvement to their tree health and production. Both farmers said they will continue to do FMNR and recommend the technique to other farmers (final survey 2021). One farmer said his skills have improved a little bit (33.3%) but he declined to answer whether it had made a different to forest health/production.



Peregrino da Cruz demonstrating his coppicing pruning technique



Ernesto Martins showing tree

Output 3 Forest carbon certification

3.1 Implementation of yearly carbon measurements.

The climate benefits of the project were assessed using the Plan Vivo-approved SHAMBA (Small-Holder Agriculture Mitigation Benefit Assessment) model by calculating the changes to biomass and soil pools. The outputs from SHAMBA were also used to calculate carbon stored in harvested wood products. A baseline of 2.8 tCO2e/ha and a 15% risk buffer were applied to the gross estimations accounting for a net climate benefit average of 247 tCO2e/ha (Halo Verde PDD 2019). Field staff, farmers and Jorge Ramos worked solidly over 3 years to achieve these measurements https://communityreforestationtimorleste.wordpress.com/2019/04/25/final-data-collection-for-project-design-document

3.2: Project Idea Note (PIN) submitted to Plan Vivo by Dec 2018.

PIN submitted in December 2018 and approved in May 2019. It can be found at; https://cdn.csu.edu.au/ data/assets/pdf file/0014/3210512/Project-Idea-Note-Timor-Leste-project.pdf

3.3: Project Design Document (PDD) submitted to Plan Vivo by June 2019. The PDD was submitted in June 2019. Final reviewed and corrected PDD with technical specifications can be viewed at https://www.planvivo.org/halo-verde-documents

3.4: Carbon auditing and certification is achieved before end of 2020.

Third party validation was completed in March 2020 with registration in May 2020 and carbon certificates issued in June 2020. The process was described in the 2020 annual report and on the website (https://communityreforestationtimorleste.wordpress.com/2020/04/15/carbon-validation-team-visits/). The validation report, registration certificate and annual reports are available at https://www.planvivo.org/halo-verde-documents

3.5: Carbon sales achieved by end of Year 4.

Carbon credits can now be purchased at https://www.carbonoffsettimor.com/

Sales have been slow due to covid 19 impacts on carbon economies. To date, a total of 630 credits have been sold at an average rate of \$22USD per tonne. These sales have generated \$12,337. Buyers include Azolla GmbH Switzerland, Zero Mission AB Sweden, Strategy 3 NSW, Australia, Industry Training Australia and some private buyers. It is expected that demand will pick up as covid 19 situation improves and the Halo Verde project becomes more widely known.

Output 4 Biodiversity information that informs forest management, education and policy

4.1 Basic information on birds, small mammals and reptiles within study sites collected by end of Year 4

The first biodiversity survey was conducted from May 29th to 4th June 2018 as part of a training program organised by Conservation International for staff of the Department of Protected Areas and our field staff. (https://communityreforestationtimorleste.wordpress.com/2018/06/10/first-biodiversity-survey/). Four reptile species, two mouse species including one not previously described and 24 bird species were identified. All birds found in the survey are classified as of Least Concern (IUCN Red List Categories) except the Black-banded Flycatcher (Ficedula timorensis) classified as Near Threatened and found in Antonio Marubi's farm. This site contains some large remnants of native vegetation. The data was passed on to the Ministry of Agriculture and Forestry and resides with CI and FCOTI. However, the plantations do provide agrobiodiversity and connections with remnant native forest areas.

A visit by Australian ecologist, Dr Graeme Gillespie in 2019 identified four fragmented forest types in the area that have not been studied for biodiversity richness or potential connectivity across the landscape (see report in Annex 7.2). As we did not have sufficient project funds for a comprehensive scientific study, we submitted grant proposals to the National Geographic Society, TL Department of Environment and UNDP but were unsuccessful.

4.2 70% increase in biodiversity information compared to pre project that contributes to government and NGO policies

Given there was no biodiversity information from the Laclubar and Soibada areas before the project, we have gained some data on birds, reptiles and small mammals which has been shared with government departments and Conservation International. However, there was not sufficient information to contribute to policies other than push for more funding to be allocated to ecological research across fragmented landscapes. FCOTI have been successful in contributing to government and NGO policies on forest management, reforestation and climate change mitigation and adaptation (see FCOTI Facebook site https://www.facebook.com/COTI01/)

4.3: <u>Information on indigenous knowledge and customary beliefs in fauna and flora interactions.</u>

The 2017 household survey (Bond and Millar 2018) revealed some local knowledge and customary beliefs regarding fauna. Figure 5 shows respondent observations of different species with frogs, lorikeets, bats, snakes and insects being the most commonly mentioned. Forty people or 89% of all respondents talked about bird and animal calls signifying death or difficulty in family, coming rain or bad spirit nearby or need to do rituals as shown in these quotes.

"Wild animals that touch our culture are kakuuk [bird]. This kakuuk calls in the morning therefore a small child has died, if it calls in the afternoon therefore an older person has died."

"Kakuk bird signals some family are about to die. Laliun bird also signals some family death. Doa birds signifies it's about to be rainy time. Kakoak bird signifies presence of spirits."

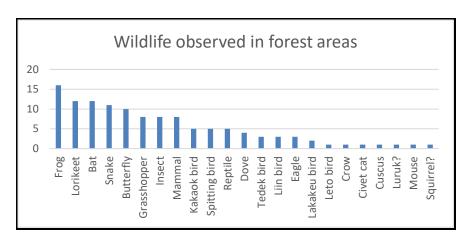


Figure 5 Wildlife observed by respondents (Baseline survey 2017)

4.4: <u>70% increase in community interest in biodiversity conservation over 4 years.</u>

There has been a substantial increase in community interest and knowledge about biodiversity conservation. Table 3 shows that nearly 90% of final survey respondents acknowledged their knowledge of plants and animals had increased as a result of being involved in growing trees, participating in tree management training, and educational talks by Conservation International, World Vision and FCOTI. Biodiversity sessions were also conducted with primary and secondary school in Laclubar in 2018.

Table 3 Estimated change in knowledge of plants and native animals

	Frequency	% of respondent households
Increased	84	89.36
Decreased	3	3.19
Stayed the same	7	7.45
	94	100.00

Most households are keen to know more about how to improve biodiversity in the area with 89% responding Yes, and 11% responding No in the final survey. The following quotes highlight what they want to learn.

I want to learn about the ecosystem and planting management
How to protect the biodiversity in our farm
I want to learn more about planting management and protection of wildlife animals

In December 2020, FCOTI field staff formed a School Nature Club at Laclubar Secondary College. Twenty students (10 male, 10 female) participated in class discussions and a field trip to learn about ecology, local fauna species, forest types, how to measure tree growth and threats to habitats (see Ecology Handbook in Annex 7.3). Also story at;

https://communityreforestationtimorleste.wordpress.com/2021/01/20/nature-club-kicks-off/

The Nature Club has been unable to conduct further activities due to a series of covid 19 lockdowns in the project area. Interestingly, when we asked households if they had heard about the Nature Club activities from students, 72% said No and 28% said Yes. This is most likely due to a lack of regular activities and/or communication with parents. FCOTI will resume biodiversity education activities with the schools and community once covid 19 restrictions are lifted.





Output 5 Livelihoods impacts determined

5.1: 50% increase in livelihood benefits from tree plantations by end of Yr 4.

The baseline survey in 2017 (Bond and Millar 2018; Bond et al. 2020) found that households received an average of US\$335/yr (US\$0.94/day) from GTNT tree payments, although this varied widely from US\$25-\$2000/year due to the variation in plantation sizes and number of trees. On average tree payments represented 32% of respondents' total household income, although this varied widely (4%-100% of total income). The final household survey in 2021 revealed that income from tree plantations had increased for 38% of households and stayed the same for 52% of households, with similar results for agroforestry products income (see 5.2 below).

The income is used primarily for buying staple foods, medicines, house items and clothes, and school requirements (Figure 6, final survey data). It is also important for saving towards more expensive items such as house repairs, livestock and tools.

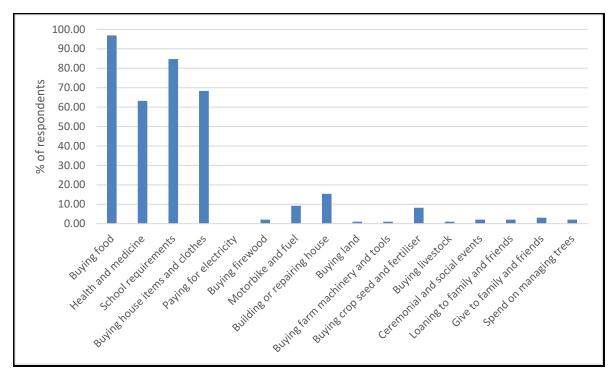


Figure 6 Use of income from tree plantations (final survey data 2021)

Table 4 shows the level of final survey respondent satisfaction with GTNT tree payments. A third of respondents were very satisfied, another third were somewhat satisfied, 17% moderately satisfied and 15% not satisfied. There was no correlation between plantation area and level of satisfaction.

	Frequency	% of respondent households
1. Not satisfied	13	14.94
2. Somewhat satisfied	27	31.03
3. Moderately satisfied	15	17.24
4. Very satisfied	32	36.78
	87	100.00

Table 4 Respondent satisfaction with tree payments (final survey data 2021).

The main multiple benefits of reforestation according to 92 respondents in the final survey were improved soils (58%), receiving income (33%), environmental benefits (27%), use of wood (7%), provision of shade (6%), farm production benefits (4%), more trees (4%) and learning about tree management (2%).

Case studies developed in 2018-19 showed participant views on income, household and environmental benefits from tree plantations.

https://communityreforestationtimorleste.wordpress.com/2018/10/20/women's-perspectives-and-aspirations/

https://communityreforestationtimorleste.wordpress.com/2019/10/13/case-studies-on-women's-livelihoods/

The main multiple challenges cited by 94 respondents in the final survey were climate change impacts (34%), time/labour constraints (32%), animals damaging trees (19%), water limitations (10%), soil limitations (5%), distance to plantation (3%), management requirements (3%), deforestation (2%), limited management skills and knowledge (2%), not enough seedlings (1%), people tying horses to trees (1%), community breaking rules (1%) and lack of suco regulations (1%). In the 2017 survey, households reported livestock encroachment, drought, insects and

weeds as the main problems. The project has encouraged community members to control livestock (build fence or tie up or supervise), water trees during drought and control weeds.

The final survey results show that these management issues have reduced, whereas climate change and time constraints are now perceived as major challenges which FCOTI will need to assist landholders to manage.

5.2: 20% increase in participant household income from carbon credits by end of Yr 4 and 15% increase in household income or food security from agroforestry by Year 4.

Carbon credit sales started in 2021 with \$7,500 yet to be distributed to farmers. GTNT have continued to pay farmers for every tree planted so we were able to gauge change in income from tree payments from the final survey (Table 4). It shows that 38% of households have increased income from planting more trees, whilst 52% are receiving the same income from tree payments. Eight households saw a decrease in income, most likely due to loss of trees.

Increase in household income from agroforestry products was similar amongst 40% of respondents, 31% had no change and 21% did not have any product income from their plantations yet (see table 1 above).

Table 4 Change in income from tree payments over the last 4 years

	Frequency	% of responding households
Increased	32	38.10
Decreased	8	9.52
Stayed the same	44	52.38
Total	84	100.00

5.3: 50% increase in women's participation in project activities by end of Yr 4.

Meeting and planting day records showed that women's participation in the project increased by 30% during the project due to encouragement by field staff. Thirty five women were trained over 2 days in August 2019 to learn how to make jams, sauces, and tamarind candies using locally available ingredients. The training was delivered by an expert from the Philippines and a female project manager was appointed.

https://communityreforestationtimorleste.wordpress.com/2019/09/09/women-make-jams-candies-and-soaps-for-sale

Ten women were provided with a loan of \$400US each to set up their businesses. Five women set up kiosks to sell basic goods and their kitchen products, three sold local wine and one woman sold fuel and one had a stationary shop. Profits ranged from \$100US to \$900US (average \$370US). All loans were repaid with zero interest rate except for two women who need more financial training. All businesses were impacted by covid 19 closure of schools and public transport which reduced customers. The funds will be rotated to other women until it reaches as many women as possible in a revolving fund mechanism.

When asked how much the women's micro-business program had benefited their families, 11 of the 19 respondents said the benefits were high or very high (Table 5). Four respondents saw low to medium benefit and another four said there was no benefit. Benefits were expressed as earning income to sustain family needs at home and children's school necessities. However survey respondents and case study interviews also revealed that women have time constraints due to their responsibilities at home so motivation and ability to participate in reforestation can vary as highlighted in the following quote; *We are busy with our children and their schools*. Interviews in 2018 showed that women spend an average of 2.7 hours each day on domestic work but also spend an average of 3.4 hours/day in the tree plantations, vegetable gardens or making palm wine (Bond et al. 2020).

Table 5 Perceived extent of benefits from women's micro business program

		% of respondent
	Frequency	households
No benefit	4	21.05
Some benefit	2	10.53
Medium benefit	2	10.53
High benefit	7	36.84
Very high benefit	4	21.05
	19	100.00

5.4: 30% of non-participating families interested in and/or able to adopt reforestation on their land.

There was a 55% increase in households participating in tree planting during the project, demonstrating that if people had available land, it was relatively easy to adopt reforestation. For those without land, the project provided capital and equipment to establish tree nurseries (20 households). https://communityreforestationtimorleste.wordpress.com/2018/08/16/spreading-benefits-to-households-who-cannot-plant-trees/

In September 2018, Drs Jennifer Bond and Joanne Millar with the help of two female translators conducted in-depth interviews with 8 households not involved in the project to explore challenges to participation and interest levels. All of the non-participating households had heard of the tree planting project and one household was involved in maintaining a nursery. However, despite having heard of the program 80% didn't know what it was about, although there was interest from this group in participating in the future. Fifty percent of these non-participating households had someone employed off-farm, as an electrician, teacher or working in the village administration, although they claimed to have the labour availability to participate in the project. We also interviewed 4 village heads and 5 people involved in community groups. Barriers to participating included lack of information about the project, land too far away from the house, too busy with house or job responsibilities and previous tree failures.

https://communityreforestationtimorleste.wordpress.com/2019/10/21/too-busy-land-too-faraway/

https://communityreforestationtimorleste.wordpress.com/2019/10/17/interested-in-planting-trees-but-dont-know-benefit/

FCOTI holds regular meetings in Laclubar and Soibada and distributes information to all households to increase awareness of the program. Farmers are now guided closely in site selection, species selection, soil preparation and weed management to ensure trees survive. In 2019-20, FCOTI expanded reforestation sites in Manatuto Vila to enable more households to participate. https://communityreforestationtimorleste.wordpress.com/2019/12/17/agroforestry-expands-to-manatuto-vila/

3.2 Outcome

The Outcome Statement <u>is "Biodiversity and livelihoods are enhanced through expansion of community reforestation that integrates agroforestry systems, farmer managed natural regeneration, biodiversity conservation, carbon payments and customary law."</u>

The project achieved the intended outcome of expanding community reforestation over 120 hectares of private land, including 35 hectares of mixed agroforestry species and 5 hectares under FMNR (indicator 0.1). Farmer run nurseries and training in silviculture improved tree survival rates (see 3.1 above). Forest inventory and GIS technology provided accuracy in validating areas and growth rates (Halo Verde PDD). Farmer managed natural regeneration had limited uptake as few farmers have natural forest areas, however those farmers using FMNR regularly said their management skills and forest health had highly improved. There was some tree loss due to landslides in 2021 which will be replanted in 2022.

Carbon measurements, modelling, validation and certification were achieved by end of the project (indicator 0.2). Carbon sales have been slower than expected (due to covid 19 impacts on markets which was not anticipated), but carbon payments will be made to farmers in 2021 as planned (see 3.1 above). The Plan Vivo accreditation process provided clear methodology and safeguards for carbon certification within a livelihoods and biodiversity context (Halo Verde PDD).

Households continued to earn direct income from trees with 38% reporting an increase in tree income and 52% maintaining the same tree income (indicator 0.3). Similarly, 41% of households said there was an increase in agroforestry products income and 31% no change (final household survey 2021). The income helps to provide food, medicines, clothes and house items to support livelihoods (Bond et al. 2020). Non-income benefits of reforestation were seen by households as improved soils, environmental benefits, use of wood, shade, and farm production benefits (final survey 2021).

Women's participation increased by 30% in relation to project meetings, field training, tree planting days and microbusiness development (indicator 0.4). Case studies interviews with women found they valued tree income primarily for childrens education and providing household necessities. The final survey showed that 79% thought there were benefits from training in food processing and financial management, and being able to take loans at zero interest. However covid restrictions reduced sales and profitability for women's enterprises in 2020-21.

Although scientific biodiversity data gathered was limited due to funding constraints, community interest in local vegetation and wildlife increased significantly (see 3.1 above). Field days, presentations and school education events generated a genuine desire to learn more about local ecology and ecosystem rehabilitation (final survey results).

3.3 Monitoring of assumptions

Risks and assumptions were monitored throughout the project with no changes to assumptions. Regarding the Outcome Assumptions, most risks were able to be managed, except for some women not having time to participate (0.4), and funding not available for more biodiversity research (0.5). We endeavoured to hold meetings and training events at convenient times for women which increased participation (section 3.1). We applied for two external grants for biodiversity research but were unsuccessful (section 3.1). Most Output Assumptions stayed relevant and manageable in terms of risk. A natural disaster occurred in 2021 (landslides/flooding) due to climate change (1.1). Livestock encroachment has reduced (1.2). Slash and burn farming continues but in smaller areas and is offset by tree plantations and conservation farming (terraces/mulching) (2.1). Those farmers that are using FMNR are committed but it has not proved popular with other landholders with limited natural forest areas (2.3). Carbon certification assumptions were managed through the PV accreditation process. Carbon market demand will continue to be influenced by global trends (3.4). Evidence provided in section 3.1.

3.4 Impact: achievement of positive impact on biodiversity and poverty alleviation Impact statement is Biodiversity and livelihoods are enhanced from community reforestation that integrates agroforestry systems, farmer managed natural regeneration, biodiversity conservation, carbon payments and customary law.

The project reforested 120ha of degraded land in central Timor Leste with associated birdlife and reptiles as identified in a biodiversity monitoring survey, and from landholder observations. Agrobiodiversity has been enhanced by the introduction of crops in the plantations such as coffee, fruit trees, pineapples, vegetables, maize and root tubers. Although these plantations are fragmented, some have connections with native forest remnants and could be providing important corridors for wildlife. Comprehensive scientific research across the landscape was beyond the scope, expertise and funding of the project. A proposal was submitted to the Department of Environment and UNDP for biodiversity research in forest remnants, the Mt Diatuto Protected Area and plantations. FCOTI will continue to advocate for an integrated landscape approach to biodiversity research and community land management.

The project is the first carbon certification project with Plan Vivo Foundation in Timor Leste. FCOTI with technical assistance from CSU, now have a methodology for determining carbon

growth from agroforestry plantations in dry tropical savanna landscapes that can be scaled out in Timor Leste. The experience gained has enabled FCOTI to consolidate community reforestation in Laclubar, and Soibada and scale out to Manatuto Vila and Viqueque administration posts. FCOTI with support from the Government of Timor Leste and international donors will continue to expand to further areas depending on funding availability. Carbon sales are now providing income for farmers that will replace the GTNT payments over time, and enable FCOTI to continue coordinating reforestation. The project has enabled FCOTI to join the national platform for climate change mitigation and adaptation policy development.

The project has improved human development and poverty alleviation in Laclubar and Soibada with trebling of households participating in the project. Income from GTNT tree payments contributed to household needs and children's education, and increased for a third of households (Bond and Millar 2018; Bond et al. 2020). Carbon sales will ensure sustained income for individual households and community projects into the future. Women's participation in the project increased and capacity to create microbusinesses was enhanced from training and microloans.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Contribution to Global Goals for Sustainable Development (SDGs)

The project has contributed to the following Global Goals for Sustainable Development.

1. **No poverty** through income generation and community livelihood diversification.

Annual tree payments were made to 146 participating households. The amount varies according to number of trees planted and surviving (from \$20 to \$2,000US) representing 4% to 100% of household income (average 32%). Most households use it to buy food, clothes, school requirements, and house items which contributes to reducing poverty. Farmers also sell fruit, vegetables and coffee grown within the plantations. Carbon credit sales will continue to generate income for these households and those that join in coming years. In terms of livelihood diversification, 10 women have started new enterprises, and 35 were trained in food processing. (indicators 0.2, 0.3, 0.4)

Zero hunger by introducing agroforestry systems (consumption and income)

The expansion of agroforestry systems over 120 hectares in the project area has increased food production and income to buy staple food items and food crop inputs for 146 households. (indicators 0.1, 0.3)

3. Quality education through capacity building of local community members.

The project has trained 146 families in land management, agroforestry, conservation farming, and making organic fertilisers. Twenty five farmers were trained in FMNR and another 24 families in tree nursery production. Five field staff were trained in GPS, forest inventory, biodiversity monitoring, FMNR and carbon measurements. Fifty school students were educated in local wildlife species and 20 students formed a Nature Club with capacity building in forest ecology. Thirty five women were trained in food processing and enterprise development. Awareness and knowledge of the environment and biodiversity has increased. (indicators 0.1, 0.4, 0.5)

4. **Gender equality** by encouraging female participation and roles in the project.

The project has encouraged equal gender participation by inviting all household members to meetings and to register for tree planting. Women became more involved in tree planting and management with guidance from a female field officer. Thirty five women participated in food processing training and 10 women obtained loans to start new enterprises. (indicator 0.4)

5. Climate action by increasing carbon stocks through reforestation.

The project resulted in 120ha of reforested land which is now earning carbon offset income and contributes to carbon emission reduction (indicator 0.2).

6. Life on Land by reducing soil erosion, deforestation and biodiversity loss. The project has rehabilitated 120ha of degraded land, brought birds back, provided shade for livestock and people, and assisted with water retention for the catchment. (indicators 0.1 and 0.5)

4.2 Project support to the Conventions or Treaties (e.g. CBD, Nagoya Protocol, ITPGRFA, CITES, Ramsar, CMS, UNFCCC)

The Secretary of State for the Environment at the National Directorate for Biodiversity Protection and Restoration is the focal point for the CBD in Timor-Leste. FCOTI signed an MoU with the Secretary of State for Environment, on the 25th of April 2019, at the Secretariat of State Office, in Fomento, Díli.

The project has contributed to the following strategic goals of the CBD;

CBD SG A: Farmer involvement in reforestation, agroforestry, and carbon accreditation has increased awareness of the value of reforestation across communities, local government and national organisations. (indicators 0.1, 0,2, 0,5)

CBD SG B: Pressure on forest and soil was reduced by adoption of sustainable forestry and agricultural practices. (indicator 0.1)

CBD SG D: Communities have benefited from healthier ecosystems, carbon income and climate change adaptation. (indicators 0.2, 0.3, 0.4)

CBD SG E: Local, indigenous and gender sensitive training and mentoring helped to build long term confidence and capacity in land management and biodiversity conservation. (0

The project via FCOTI has contributed to the development of Climate Change policies for the UNFCCC and Second National Communication report. Alexandre Sarmento, Guido Diamantino and Thalia Soares participated in two workshops of the Working Group on Climate Change in Dili in June and December 2020. Project reforestation activities have contributed to climate change mitigation priorities listed as c) exploring carbon markets potential by promoting afforestation etc (Secretary for the State for Environment, 2020 page 23).

4.3 Project support to poverty alleviation

The beneficiaries were 146 rural households living in Laclubar and Soibada administrative posts in the central uplands of Timor Leste. The project assisted these families to plant trees for multiple purposes on 120 hectares of land (timber, carbon, shade for coffee plants, biodiversity and microclimate for food crops). Income from every surviving tree helped households with buying food and clothes, paying for school expenses, investing in agricultural inputs and saving for capital items (section 3.1, indicator 5.2). The project facilitated carbon accreditation with Plan Vivo (Halo Verde project) resulting in carbon sales of \$12,337US in 2021 of which \$7,400 (60%) will be paid to households subject to clarifications from Plan Vivo. The remainder (40%) will fund FCOTI staff, operating costs and community projects based on PES Agreement signed between FCOTI and the participating farmers. In both surveys and indepth interviews with women, many beneficiaries expressed appreciation that tree income and microbusiness development was contributing to their children's education and future as expressed by a woman from Lafulau village.

You can plant a carrot and it will grow and you will eat it and then it is gone, but trees are for the children's future.

The environmental benefits of their tree plantations were also expressed in the context of their wellbeing as in this quote from a man from Maneatun village.

I feel happy with this program because we can grow plants in our land that is empty and makes us happy when these plants grow well and we can continue having the desire to go to visit our fields.

4.4 Gender equality

The project encouraged and facilitated equal participation and benefit sharing for men and women in all activities and outcomes. Women participation increased by 30% in community meetings, tree planting, nursery and tree management, and agroforestry training activities (see section 3.1-5.3). Women benefited indirectly from tree income paid to each household (section 4.3). Thirty five women benefited from food processing and financial training to develop their own microbusinesses, and ten women took loans to start up new businesses (section 3.1-5.3). The school nature club involved ten females and ten males in ecology training (section 3.1-4.4).

4.5 Programme indicators

• Did the project lead to greater representation of local poor people in management structures of biodiversity?

Stakeholder consultation with local communities took place as a process of the carbon accreditation for ecosystem rehabilitation (see Halo Verde PDD 2020). Participating farmers and households in the project signed management agreements for their tree plantations and carbon certificates. The Halo Verde PDD (2020) sets out the ongoing management structure for ecosystem rehabilitation and biodiversity, including a steering committee and several farmer groups. A grievance process was developed.

Were any management plans for biodiversity developed and were these formally accepted?

Individual farmer management plans have been developed for each plantation site as part of the Plan Vivo accreditation process.

Were they participatory in nature or were they 'top-down'? How well represented are the local poor including women, in any proposed management structures?

The project acknowledges and includes women and marginalized groups (such as landless households, older citizens and veterans), through nursery operations and other project-related activities, such as training days and membership of the steering committee. The project also has an environmental education program aimed at primary and secondary students, benefiting approximately 90 students. The project is further developing communication channels through an input-and-grievance mechanism.

How did the project positively influence household (HH) income and how many HHs saw an increase?

The project facilitated income for households from tree payments, sale of agroforestry products and microbusiness development. The final household survey in 2021 revealed that income from tree plantations had increased for 32 households (38% of respondents) and stayed the same for 44 households (52%), with 44 households (40%) also receiving income increase from agroforestry products (see section 3.1-5.1, 52). Ten women were provided with a loan of \$400US each to set up their microbusinesses. Five women set up kiosks to sell basic goods and their kitchen products, three sold local wine and one woman sold fuel and one had a stationary shop. Profits ranged from \$100US to \$900US (average \$370US). All loans were repaid with zero interest rate except for two women who need more financial training.

How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?

Household annual income from agroforestry was estimated by 23 participants to have increased up to 25% above baseline (2017) estimates (average \$84US/household increase to baseline of \$1,000/household), seven households estimated between 25-60% increase (average \$84 to \$200US increase), one household estimated 100% increase (\$335US) and 13 households did not know extent of increase. Given the national average household income is US\$1,800 (https://data.worldbank.org/country/timor-leste) and less for rural people, these increases represent important supplementary income for rural household.

4.6 Transfer of knowledge

Information from the biodiversity monitoring survey was extended to the Timor Leste Department of Environment (Annex *). Biodiversity research needs arising from visit by Dr Graeme Gillespie were circulated to the Department of Environment and UNDP (Annex *). FCOTI staff regularly liaise with the Ministry of Agriculture and Forestry, Department of Environment and Directorate of Climate Change to update them on carbon offset activities and advise on reforestation methods. Alex Sarmento gave presentations on the Halo Verde Carbon Accreditation process to the National Working Group on Climate Change in 2020 to encourage scaling out of smallholder carbon schemes. He also presented a paper at the Timor Leste Studies Association conference in 2019 to inform University teaching staff and NGO personnel about the project methods and have appeared national outcomes. FCOTI on TV several https://www.facebook.com/fundacaocarbonoffsettimor.timor). Dr Joanne Millar, Dr Jennifer Bond and Jorge Ramos presented papers at the Asian Studies Association of Australia conference in Sydney (2018), and International Study of the Commons conference in Peru in 2019 (see list in Annex *). A journal paper was published on lessons learnt from the project regarding livelihood benefits and challenges from smallholder carbon schemes.

4.7 Capacity building

The project manager Alex Sarmento has increased the national profile of FCOTI through networking, facebook, the Darwin project and onground works. He was invited to participate in the National Working Group on Climate Change. Alex is now a well-known figure in the conservation field and regularly sought for TV and radio interviews by the national press. FCOTI field staff have become more skilled in on-ground implementation and monitoring as a result of the Darwin project. Office staff have improved their recording keeping and reporting to donors. Field staff at Lacluba and Soibada have attended several national and regional meetings, with Mr Guido Demantino taking on the role of giving presentations and maintaining the database of tree plantations. Ms Thalia Soares joined FCOTI in 2018 and learnt valuable skills in administration, promotion, communication and data collection. She has been promoted to a higher position in another NGO.

5 Sustainability and Legacy

The project achievements that will continue are carbon accreditation, scaling out of agroforestry and income generation from carbon sales, agroforestry products and microbusinesses (section 3.1). The project has influenced national policies on Climate Change, Agroforestry and Upland reforestation (section 4.2).

The exit strategy is still valid with all key components now in place to ensure a sustained legacy from the project outcomes, as evidenced by;

- GTNT has formed FCOTI, a local NGO with a Board of Directors, an Executive Director, two administrative staff and five field staff. FCOTI will manage the carbon certification and payments process in Laclubar and Soibada, with potential to scale out to other districts. FCOTI has received funding from other sources to expand agroforestry and mangrove rehabilitation.
- 2. GTNT/FCOTI have developed a business model for community based carbon credit development and sales in Laclubar and Soibada.
- 3. FCOTI has provided information and guidance to relevant government departments on carbon certification, community involvement in reforestation and policy recommendations.
- 4. FCOTI have the Plan Vivo standards and guidelines to adhere to ensure sustained technical, ecological, economic and social outcomes

6 Lessons learned

What worked well

1. Local, proactive NGO with links to communities. The consolidation of FCOTI as the registered local NGO to coordinate and expand reforestation and carbon offsets in Timor

Leste has worked well. It has led to additional grants, more office staff and stronger relationships with sectors of the Timorese government and international NGOs. FCOTI has close relationships with local communities in Manatuto due to family links. Field staff are from the project area so community participation and motivation is high. FCOTI have plans for further expansion and are now in a good position to build on the achievements of the Darwin project. GTNT will continue to support FCOTI.

2. Professional technical input. Comprehensive technical guidance and modelling from Jorge Ramos (CSU forest research officer) has enabled the team to generate the required quality data for the PDD. This is an essential success factor and highly recommended for similar projects embarking on carbon certification. Another lesson learnt is that the process of skilling up field staff, mapping and measuring trees takes time, especially in developing countries where carbon certification is a new concept and research skills are low. The Darwin project has enabled a poor, developing country to enter the carbon market for the benefit of smallholder tree growers. This would not happen without external input to act as a catalyst. We highly recommend Plan Vivo Foundation as a competent and supportive facilitator of carbon accreditation and agreements in developing countries. CSU social researchers, Joanne Millar and Jennifer Bond provided sound research design and with trained enumerators were able to capture people's experiences, views and livelihood impacts.

What didn't work well

- 1. Lack of funds for comprehensive biodiversity research. Biodiversity research is expensive and requires good, scientific design. We underestimated the budget and time required to do a comprehensive survey of fragmented forest remnants and agroforestry plantations. Carbon certification to provide long term livelihood improvement was the main aim of the project and took up most of the budget. Biodiversity research needed additional funding but is hard to obtain in Timor Leste.
- 2. Limited application of FMNR. FMNR is applicable to areas of degraded natural forest where regeneration can be encouraged via pruning and mulching. Few farmers had such areas in our project location, so the application of FMNR was limited and did not scale out. FMNR areas were not included in carbon accreditation which may also have acted as a discentive.
- 3. Biodiversity education needs dedicated teachers/facilitators. We were unable to conduct regular biodiversity education events as there were no local facilitators available and field staff did not feel confident to conduct detailed ecological lessons. The school activities relied on visiting Australian project staff which ceased when covid restrictions were introduced.

If you had to do it again, what would you do differently or recommend to others:

- Engage Plan Vivo Foundation from the beginning as it is well suited to smallholder carbon projects.
- Allow more budget for biodiversity research.
- Only include FMNR in projects where landholders have natural forest sites.
- Engage and budget for experienced biodiversity educators to run school and community activities.

6.1 Monitoring and evaluation

The timeframe for carbon accreditation was extended due to lack of success with the first accreditation provider, and additional requirements of Plan Vivo certification. The area of viable trees for carbon accreditation was reduced as a couple of villages dropped out of the original GTNT project and more accurate GPS mapping showing low tree survival in some areas. The original estimate of 40ha under FMNR was revised down to 5ha based on farmer interest over smaller areas than initially envisaged. Income estimates from carbon sales and agroforestry products were separated. More specific wording for indicators of output 5 for monitoring purposes were used. Targets related to conducting comprehensive biodiversity research were deleted due to lack of funding and expertise. Annual household surveys (3) were reduced to one baseline

survey in 2017 and one final survey in 2021 due to the slow nature of livelihood change from reforestation and carbon certification. Indepth interviews for case studies were introduced in 2018 to capture interim changes.

The logical framework was very useful for monitoring indicators and reporting on activities, outputs and outcomes to partners and stakeholders. Means of verification were kept simple and easy to use for evaluating the indicators. The Plan Vivo carbon certification process provided very comprehensive measurements for objectives 1 and 3 (agroforestry expansion and carbon modelling/certification)-see Halo Verde PDD, external validation report and Annual reports, all of which were reviewed by external consultants by Plan Vivo Foundation. Means of verification for objectives 2, 4 and 5 (FMNR, biodiversity research/education, livelihood impacts) were primarily evaluated using household surveys, indepth interviews and on-ground observations with stakeholders. A combination of quantitative and qualitative data proved effective in tracking outputs and outcomes (section 3.1, 3.2). Biodiversity monitoring was undertaken by an external NGO (Conservation International, Dili) and evaluated by an external consultant (Dr Graeme Gillespie from Australia) who designed a more scientific and comprehensive research proposal.

6.2 Actions taken in response to annual report reviews

Issues raised in annual report reviews have been addressed in half year reports and annual reports. Reviews were shared and discussed with project partners.

7 Darwin identity

The main avenue for publicising the Darwin Initiative and UK government departments involved has been the project website at; www.communityreforestationtimorleste.wordpress.com. It is linked back to the Darwin Initiative Facebook site. Information from the website on referrers show that visitors have found the site via facebook, google, raebia.org, World Vision, CSU, ILWS, Researchgate, Plan Vivo, DI and FCOTI websites. The Darwin Initiative logo was used on all conference presentations and reports and acknowledgements were included in published papers. Team members took the opportunity to promote Darwin funding opportunities at events and pass on Darwin contact details.

Although the Darwin project was part of a larger program run by GTNT and FCOTI, the project activities were recognised and promoted as a distinct project aimed at securing carbon certification, expanding reforestation, building capacity and improving livelihoods. It is now widely known amongst environmental and agricultural NGOs, the Ministry of Agriculture and Forestry and Department of Environment. The project website has been effective with 110 visitors and 263 views from 20 countries over 3.5 years. Most viewers were from Australia, Timor Leste and USA, followed by UK, Germany, Portugal, South Korea and a few each from Sweden, Indonesia, Malaysia, India, Japan, Philippines, Norway, Canada, Belgium, Mexico, Switzerland and the Netherlands. We suspect that the European viewers were potential carbon buyers whilst Asian viewers were keen to see how smallholder reforestation can enter the carbon market.

8 Impact of COVID-19 on project delivery

Our project was fortunate that covid-19 only affected some of our activities late in the project. Most activities had been completed by the time covid 19 restrictions were imposed by the Timorese government in 2020. However it did impact on women's microbusinesses which they started up just before the first lockdown so they lost some customers and potential income (section 3.1). School nature club activities were delayed to December 2020 and could not continue as schools kept closing down. The response has been to wait for lockdowns to cease and resume financial training for women, and biodiversity education for school students (A. Sarmento pers. comm).

The final household survey was conducted by FCOTI field and office staff as the project leader and social researcher were unable to travel to Timor Leste. We provided guidance via email and whatsapp. The survey was conducted when there was no lockdown and masks and distancing were adhered to. Tree nurseries and planting were able to continue by social distancing and using masks. FCOTI have been vigilant in protecting project staff by suppling appropriate gear, organising vaccinations and testing when required. Meetings were not held during covid restrictions to ensure safety of the communities. Increased income from the project may assist

households with hospital expenses associated with future pandemics, but the Timorese government funds vaccinations and testing. Beyond the pandemic if travel is allowed, we will continue to visit the project site to see firsthand how the plantations are growing and to talk to households about livelihood improvements.

9 Finance and administration

9.1 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
CSU (in kind salary for Dr Jennifer Bond)	
GTNT (in kind salary for admin staff)	
World Vision Timor Leste (in kind salary for staff doing training courses)	
RAEBIA (in kind salary for staff doing conservation farming training)	
Australian Landcare International (cash towards nursery supplies)	
EU (grant for expansion of agroforestry to Manatuto Vila)	
Carbon sales	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
UNDP (tree planting in 2021 and mangrove rehabilitation(
TOTAL	

9.2 Value for Money

The project was able to keep carbon accreditation costs to a minimum by using Plan Vivo Foundation which was cheaper than Gold Standard and more suited to smallholder carbon schemes. Carbon accreditation is a short term cost that will generate long term income for poor communities so represents value for money. We have been able to leverage funds to 50% of total project cost by relying on partner organisations to do most of the on-ground work, keeping travel costs to a minimum and securing contributions from all partners and external grants. We have maintained a low capital cost with items remaining with country partners for ongoing use.

10 OPTIONAL: Outstanding achievements of your project during the (300-400 words maximum). This section may be used for publicity purposes

I agree for the Darwin Secretariat to publish the content of this section

The project demonstrated that smallholder farmers in developing countries can engage with the international carbon market for long term poverty alleviation. Support from the UK Darwin Initiative Fund enabled Australian and Timorese partners to expand community reforestation over 120 hectares of degraded land in the central uplands of Timor Leste. The forests were measured for carbon uptake and qualified for carbon accreditation. It is the first scheme in Timor Leste to be registered with Plan Vivo Foundation. The project developed a stakeholder management structure for equitable carbon income distribution, and ensured poor, landless households also benefited from growing trees and women's microbusinesses. Local communities are more aware of the benefits of growing trees for household income and biodiversity. Income has proved essential for food, clothes, household items and school expenses. The project was a catalyst for further investment in upland reforestation and climate change mitigation policies. Local Timorese partner, Foundation for Carbon Offsets Timor Leste (FCOTI) will continue to scale out community reforestation, provide carbon income for households, facilitate community development including womens enterprises and participate in climate change policy implementation in Timor Leste.

Annex 1 2019-20 REVISED LOGICAL FRAMEWORK FOR PROJECT 24 025

Community reforestation for biodiversity, livelihood diversification and culture

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Biodiversity and livelihoods are enhabited biodiversity conservation, carbon pay	anced from community reforestation that	integrates agroforestry systems, fa	armer managed natural regeneration,
Outcome: (Max 30 words) Biodiversity and livelihoods are enhanced through expansion of community reforestation that integrates agroforestry systems, farmer managed natural regeneration, biodiversity	0.1 100 Hectares successfully reforested via planting and farmer managed natural regeneration by end of Yr 4 0.2 Carbon certification by end of 2020 and payments achieved by end of Yr 4 0.3 20% increase in household income	O.1 Forest inventory reports and Remote sensing/GIS and Photo points O.2 Plan Vivo accreditation certificate and carbon payments	O.1 Free satellite imagery is available for project area O.2 Adequate safeguards are in place to ensure longevity of transactions. O.3 Information is available to
conservation, carbon payments and customary law.	of project participants from carbon sales by end of Yr 4 compared to the baseline in Yr 1 0.4 50% increase in women's participation and satisfaction in all activities by end of Yr 4 against baseline of Yr 1. 0.5. 70% increase in biodiversity information and community interest in biodiversity conservation over 4 years.	 0.3 Household surveys, case study interviews and carbon sales. 0.4 Attendance records and indepth interviews with women. 0.5 Biodiversity survey report and household surveys. 	determine reliable socio-economic indicators to build a baseline 0.4 Women are motivated and have time to participate. 0.5 Basic data on the presence of birds, bats, reptiles and amphibians is determined and expanded upon in the subsequent years if funding available.
Outputs: 1. Expansion of tree plantations and agroforestry development	 1.1. 100 Hectares (ha) planted including 20 ha under an agroforestry system by end of Yr 4. 1.2. 70% tree survival rate achieved after 1st year of new planting establishment 	1.1 Land use classification before project (baseline) and after project using GIS data, project database and ground assessment.	1.1 Natural disasters and livestock will not impact the project1.2 The tree species selected are appropriate and weeds controlled

	 1.3 100 households participating in tree planting and maintenance with <i>Tara Bandu</i> in place by end of Yr 4 1.4 15% increase in household income from agroforestry by end of Yr 4 	1.2 Annual tree and survival counts1.3 Participants register and field observations.1.4 Household surveys and case study interviews.	1.3 Farmers have land and are physically able to participate.1.4 Farmers have access to markets and include nutritious fruit and nuts in their family's diet.
2. Establishment of farmer managed natural regeneration (FMNR) in eroded areas	2.1 5 ha of low fertility land undergoing FMNR by end of Yr 4.2.3 50% improvement in farmer's forest management skills including sustainable harvesting by end of Yr 4	2.1 GPS measurements2.3 Final household survey and field observations by staff.	2.1 Community members motivated to changing old land management practices such as slash and burning 2.3 Farmers committed to good management practices.
3. Forest carbon certification	 3.1 Implementation of yearly carbon measurements. 3.2 Project Idea Note (PIN) submitted to Plan Vivo by Dec 2018 3.3 Project Design Document (PDD) submitted to Plan Vivo by June 2019 3.4 Carbon auditing and certification is achieved before end of 2020. 3.5 Carbon sales achieved by end of Year 4. 	 3.1 Forest carbon monitoring through installation of sampling plots. 3.2 PIN completed and submitted. 3.3 PDD completed and submitted. 3.4 Number of carbon certificates validated by third party and audit report 3.5 Register of carbon sales. 	3.1 Project staff, students and farmers willing to collaborate in forest carbon monitoring. 3.2 PDD is satisfactory 3.3 Safeguards regarding transaction costs, land tenure and accountability are in place. 3.4 Market conditions for carbon purchases exists and demand will continue.

4. Biodiversity information that informs forest management, education and policy.	4.1 Basic information on birds, small mammals and reptiles within study sites collected by end of Year 4.	4.1 Inventory of birds, reptiles and small mammals in sample sites of plantations.	4.1 Community gives permission for biodiversity research in their plantations.
	4.2 70% increase in biodiversity information compared to pre	4.2. Biodiversity survey and stakeholder workshop.	4.2 Species can be readily identified including threatened species.
	project that contributes to government and NGO policies.	4.3 Household survey and indepth interviews with	4.3 Community members are willing to share customary beliefs and local
knowledge and customary beliefs in fauna and flora interactions	community members. 4.4 Household surveys and evaluation of school education sessions.	knowledge. 4.4. Villagers and the schools actively participate in biodiversity education events.	
5. Livelihoods impacts determined	5.1 50% increase in livelihood benefits from tree plantations by end of Yr 4 5.2 20% increase in participant	5.1 Baseline and Final Household surveys and case study interviews.	5.1 Information is available to determine reliable socio-economic indicators to build a baseline
	household income from carbon credits by end of Yr 4 and 15% increase in household income from		5.2 Women are motivated and have time to participate.
	increase in household income from agroforestry products by Year 4. 5.3 50% increase in women's participation in project activities by end of Yr 4. 5.4 30% of non-participating families interested in and/or able to adopt reforestation on their land.	5.2 Carbon sales records and household surveys.	5.3 Farmer to farmer exchange is facilitated well with non-participating farmers.
		5.3 Attendance records and indepth interviews with women.	
		5.4 Semi-structured interviews with non-participating farmers.	

Annex 2 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements
	ced from community reforestation that nanaged natural regeneration, biodiversity omary law.	The project reforested 120ha of degraded land in central Timor Leste resulting in observed increase in biodiversity. Carbon accreditation achieved providing long term income for households. Livelihoods improved with income contributing to household needs and children's education.
Outcome Biodiversity and livelihoods are enhanced from community reforestation that integrates agroforestry systems, farmer managed natural regeneration, biodiversity conservation, carbon payments and customary law.	 0.1 100 Hectares successfully reforested via planting and farmer managed natural regeneration by end of Yr 4 0.2 Carbon certification by end of 2019 and payments achieved by end of Yr 4 0.3 20% increase in household income of project participants from carbon sales by end of Yr 4 compared to the baseline in Yr 1 0.4 50% increase in women's participation and satisfaction in all activities by end of Yr 4 against baseline of Yr 1. 0.5. 70% increase in biodiversity information and community interest in biodiversity conservation over 4 years. 	120ha reforested with timber and native tree species on degraded land. 5ha under farmer managed natural regeneration. Nineteen sites were affected by landslides in 2021 with 1149 trees damaged. These areas will be replanted in 2022 by FCOTI. Carbon accreditation achieved in 2020 and credit sales in 2021. Adequate safeguards are in place with Plan Vivo accreditation and reporting to ensure longevity of transactions and livelihood benefits. 38% of households reporting an increase in tree income and 52% maintained the same tree income. 41% of households had an increase in agroforestry products income up to 25% and 31% had no change. The income helps to provide food, medicines, clothes and house items to support livelihoods. Information reliable from final household survey. 30% increase in women's participation in agroforestry activities and 80% satisfaction with benefits to households. Time and motivation are ongoing limitations to full participation. 100% increase in basic biodiversity information and 90% increase in community awareness and interest in biodiversity conservation. More comprehensive biodiversity research needed across diverse landscapes.
Output 1. Expansion of tree plantations and agroforestry development	 1.1. 100 Hectares (ha) planted including 20 ha under an agroforestry system by end of Yr 4. 1.2. 70% tree survival rate achieved after 1st year of new planting establishment 1.3 100 households participating in tree planting and maintenance with <i>Tara Bandu</i> in place by end of Yr 4 	120 hectares planted with 35ha under agroforestry system with food crops. 80% tree survival rate after first year due to farmer training in tree planting and management. 146 households participating in tree planting and maintenance. Tara Bandu in place in all villages.

	1.4 15% increase in household income or food security from agroforestry by end of Yr 4	Up to 25% increase in household income from agroforestry for 52% of households. A few households had higher increase, 20% had no increase.		
Activity 1.1		Completed in 2017-18		
Community agreement on land use with regards to proposed activities is formalised through a Tara Bandu ceremony.				
Activity 1.2		Completed as households joined		
Registration of project participants for bo	th planting and FMNR activities			
Activity 1.3		Completed every year		
Training of participants in tree propagation	on, planting and tree/fruit management.			
Activity 1.4		Completed every year		
Identification of sites, species selection for both reforestation and agroforestry systems, propagation of seedlings and tree nursery expansion, site preparation, planting etc.				
Activity 1.5		Completed every year		
Monitoring of new plantings on a quarter	ly basis			
Output 2. Establishment of farmer managed natural regeneration (FMNR) in eroded areas	2.1 5 ha of low fertility land undergoing FMNR by end of Yr 4.2.3 50% improvement in farmer's forest management skills including sustainable harvesting by end of Yr 4	5ha managed using FMNR techniques by four farmers. FMNR not popular due to time needed and natural forested land. Of the 3 farmers interviewed in the final survey, two said there forest management skills had very highly improved (66.7%) and they had observed a highly significant improvement to their tree health and production. One farmer said his skills have improved a little bit (33.3%) but he declined to answer whether it had made a different to forest health/production.		
Activity 2.1.	1	Completed in 2017		
Farmer tour to World Vision FMNR sites to talk directly to local farmers and WVI staff and see how FMNR is done.				
Activity 2.2.		Completed in 2018		
Identification of project FMNR sites and establishment of a land use baseline through field assessments and map production.				
Activity 2.3		Completed in 2018		

Delivery of workshops in Laclubar and S include pruning, terracing, fertility buildin silvicultural management.					
Activity 2.4		Completed every year			
Monitoring of FMNR on a yearly basis th surveys.	rough field inspections and regeneration				
Output 3.	3.4 Implementation of yearly carbon	Carbon measurements completed each year and fed into carbon modelling for			
Forest carbon certification	measurements. 3.5 Project Idea Note (PIN) submitted to	PDD.			
	Plan Vivo by Dec 2018	PIN submitted to Plan Vivo in December 2018			
	3.6 Project Design Document (PDD) submitted to Plan Vivo by June 2019	PDD submitted to Plan Vivo in June 2019			
	3.4 Carbon auditing and certification	Carbon accreditation achieved in June 2020. Safeguards in place.			
	is achieved before end of 2019.	Carbon sales achieved from late 2020 into 2021. Carbon market currently weak			
3.5 Carbon sales achieved by end of Year 4.		due to covid impacts but anticipated to strengthen in 2022.			
Activity 3.1.		Completed in 2017-2018			
Completion of a carbon project plan.					
Activity 3.2.		Completed in 2017-2018			
Procurement of free satellite imagery wit generate digital maps (also used in Outp					
Activity 3.3		Completed in 2018-19			
Formalisation of contract arrangements	pertaining to carbon rights with farmers.				
Activity 3.4		Completed in 2018-19			
Design of a carbon baseline ('without procarbon stocks and emission reductions of					
Activity 3.5 Design of community grievance and communication strategies with project participants and relevant stakeholders		Completed in 2018-19			
Activity 3.6		Completed in 2017-19			
Formal local stakeholder consultation as per selected certification methodology					
Activity 3.7		Completed in 2018-19			
Submission of information and documen conducted by the certifier (pre-feasibility					

Activity 3.8		Completed in March 2020 and July 2020				
Third party audit and issuance of carbor	n credits					
Activity 3.9		Completed every year				
Forest carbon monitoring as part of mor on a yearly basis	nitoring of new plantings and regeneration					
Output 4 Biodiversity information that informs forest management, education and policy.	4.1 Information on birds, small mammals and reptiles (including any endangered species) within study sites and surrounding landscape collected by end of Year 4.	Biodiversity survey of some agroforestry sites completed in May 2018. Biodiversity research across forest landscapes unable to be conducted due to lack of external funding.				
4.2 70% increase in biodiversity information compared to pre project that contributes to government and NGO policies.		100% increase in basic biodiversity information. Data sent to Department of Environment. Grant proposals submitted to Department of Environment and UNDP and National Geographic Society for forest biodiversity research to increase policy focus on upland forest biodiversity and reforestation.				
	 4.3 Information on indigenous knowledge and customary beliefs in fauna and flora interactions compiled by end of Year 2. 4.4 70% increase in community interest in biodiversity conservation over 4 years. 	Local knowledge of fauna and customary beliefs capture in baseline household survey in 2017. Interactive discussions with secondary school students on their fauna observations. 90% increase in community awareness of biodiversity over project due to agroforestry development, talks at meetings, school events and establishment of School Nature Club.				
Activity 4.1		Not needed for 2018 survey				
Gain animal ethics approval through CS Agriculture, Forests and Fisheries to und						
Activity 4.2		Completed at schools				
Development of a community knowledge exchange program regarding biodiversity Activity 4.3						
		Completed in June 2018.				
Annual sampling of reforestation and co amphibians with community members	ntrol sites for birds, bats, reptiles and					
Activity 4.4 Development of materials – posters and community workshops	brochures for use in school visits and	Completed in 2019-2020				

Activity 4.5	, , ,, ,, ,, ,, ,,,	Completed every year
	d gender-sensitive discussions with adult	
women		
Activity 4.6		Completed
	advise outputs of community biodiversity	
surveys and make policy recommendati		
Output 5.	5.1 50% increase in livelihood benefits	The main multiple benefits of reforestation according to 92 respondents in the final
Livelihoods impacts determined	from tree plantations by end of Yr 4	survey were improved soils (58%), receiving income (33%), environmental benefits
Ziveimieede impacte determined	5.2 20% increase in participant	(27%), use of wood (7%), provision of shade (6%), farm production benefits (4%),
	household income from carbon credits	more trees (4%) and learning about tree management (2%).
	by end of Yr 4 and 15% increase in	38% of households reporting an increase in tree income and 52% maintained the
	household income or food security from	same tree income. 41% of households had an increase in agroforestry products
	agroforestry by Year 4.	income up to 25% and 31% had no change.
	5.3 50% increase in women's	30% increase in women's participation in agroforestry activities and 80%
	participation in project activities by end	satisfaction with benefits to households.
	of Yr 4.	
	5.4 30% of non-participating families	
	interested in and/or able to adopt	55% increase in number of households participating in reforestation over four
	reforestation on their land.	years of project. More households are interested but did not have information.
		Twenty households without land established tree nurseries as income source.
Activity 5.1 Recruitment of a female fie	eld officer for Soibada to encourage other	Completed
	ired to be provided by the current female	
field officer based in Laclubar	,	
A 1: 1: 5 0 0		0
	ic baseline survey focusing on income and	Completed in 2017-18
perceived well-being		
Activity 5.3 Annual household surveys	to assess project performance against the	Completed as baseline and final surveys
socio-economic baseline	1 1 1	, i
A ativity E A		Completed in 2040
Activity 5.4	ana (in alcedina e coma an)	Completed in 2018
Indepth interviews with case study farme	ers (including women)	
Activity 5.5		Completed in 2018
Indepth interviews with women to deterr	mine benefits and limitations for them	
Activity 5.6		Completed in 2018
Semi-structured interviews with non-participating farmers in the same villages to		Completed in 2010
determine spread of influence and impacts		
Activity 5.7		Not completed due to covid travel restrictions and funds finished
	unity attitudes to environmental and social	The completed due to covid travel restrictions and fullds inhibited
	ntegrating carbon markets and customary	
law	magrating ourson markets and oustomary	
IUW		

Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or	Language	Comments
Traini	raining Measures		Nationality	Gender	Focus	Language	Comments
1a	Number of people to submit PhD thesis						
1b	Number of PhD qualifications obtained						
2	Number of Masters qualifications obtained						
3	Number of other qualifications obtained						
4a	Number of undergraduate students receiving training	4	Timorese	Female	Conducting interviews	English/Tetum	
4b	Number of training weeks provided to undergraduate students	0.2	Timorese	Female	Conducting interviews	English/Tetum	
4c	Number of postgraduate students receiving training (not 1-3 above)						
4d	Number of training weeks for postgraduate students						
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification (e.g., not categories 1-4 above)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)	50	Timorese	Male and Female	Forest inventory, Tree management, Composting	Tetum	
6b	Number of training weeks not leading to formal qualification	1	Timorese	Male and Female	Forest inventory, Tree management, Composting	Tetum	

7	Number of types of training materials produced for use by host country(s) (describe training materials)		by host country(s) (describe training materials)		Australian			English/Tetum English/Tetum	
			Australian	Female	Ecology handbook	English/Tetum			
Resea	arch Measures	Total	Nationality	Gender	Title	Language	Comments/ Weblink if available		
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)								
10	Number of formal documents produced to assist work related to species identification, classification and recording.								
11a	Number of papers published or accepted for publication in peer reviewed journals	1	Australian	Female 2 1 Male	Forests, trees and livelihoods journal	English	See pubs list below		
11b	Number of papers published or accepted for publication elsewhere	1	Australian	Male	IASC Conference paper	English	See pubs list below		
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1	Timorese	Male	Conservation International	English			
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country								

13a	Number of species reference collections established and handed over to host country(s)			
13b	Number of species reference collections enhanced and handed over to host country(s)			

Disse	mination Measures	Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work						
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	3	Timorese Australian	Male Female/Male	Timor Leste	English	

Physi	Physical Measures		Comments
20	Estimated value (£s) of physical assets handed over to host country(s)		
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established		220 Agroforestry plantations

Financ	cial Measures	Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work (please note that the figure provided here should align with financial information provided in section 9.2)						

Annex 4 Aichi Targets

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	✓
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	✓
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	
9	Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	
13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	

14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	✓
15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	✓
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	√
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

Annex 5 Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details. Mark (*) all publications and other material that you have included with this report

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. web link, contact address etc)
Journal paper *	Livelihood benefits and challenges of community reforestation in Timor Leste: implications for smallholder carbon forestry schemes, Jennifer Bond, Joanne Millar & Jorge Ramos 2020	Australian	Australian	Female	Forests, Trees and Livelihoods, 29:3, 187-204	https://www.tandfonline.com/doi/full/10.1080/1472 8028.2020.1798817 https://www.researchgate.net/publication/3432599 22_Livelihood_benefits_and_challenges_of_comm unity_reforestation_in_Timor_Leste_implications_f or_smallholder_carbon_forestry_schemes
Conference paper *	Facilitating transition from degraded commons to reforested land and better livelihoods using voluntary carbon schemes: Lessons from Timor-Leste. Jorge Ramos and Joanne Millar, 2019	Australian	Australian	Male	International Society for Study of the Commons	https://dlc.dlib.indiana.edu/dlc/handle/10535/10606
Farmer Training manual *	Agroforestry training guide. Zocema Almendras 2019	Filipino	Filipino	Female	FCOTI, Dili	
Student handbook *	Ecology guidebook. Joanne Millar 2020	Australian	Australian	Female	CSU	

Annex 6 Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide details for the main project contacts below. If you are providing personal details on behalf of someone else, please ensure that they have agreed to sharing their information with us.

Please add new sections to the table if you are able to provide contact information for more people than there are sections below.

Please see our Privacy Notice on how contact details will be used and stored: https://www.gov.uk/government/groups/the-darwin-initiative#privacy-notice.

Ref No	24 005						
Project Title	Community reforestation for biodiversity, livelihood diversification and culture						
Project Leader Details							
Name	Joanne Millar						
Role within Darwin Project	Project Leader						
Address							
Phone							
Fax/Skype							
Email							
Partner 1							
Name	Alexandre Sarmento						
Organisation	Fundacio Carbon Offsets Timor Leste						
Role within Darwin Project	Project Manager						
Address							
Fax/Skype							
Email							
Partner 2 etc.							
Name	Jorge Ramos						
Organisation	Charles Sturt University						
Role within Darwin Project	Research Officer						
Address							
Fax/Skype							
Email							

ċ

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@Itsi.co.uk putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with	