



Darwin Initiative: Final Report

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

Darwin Project Information

Project reference	21-009
Project title	Biodiversity conservation through poverty alleviation: enabling sustainable forestry in Belize (SUSFOR for short)
Host country(ies)	Belize
Contract holder institution	University of Oxford
Partner institution(s)	Belize Forest Department; University of Belize – Environmental Research Institute
Darwin grant value	£288,813
Start/end dates of project	June 2014/March 2017
Project leader’s name	Prof. Yadvinder Malhi
Project website/blog/Twitter	https://www.youtube.com/channel/UCRYsdpeA9VxPr0qinZ7sZEQ/feed
Report author(s) and date	Percival Cho

1 Project Rationale

This project addressed the problem of over-harvesting of CITES-listed tropical timber species in Belize, namely *Swietenia macrophylla* and *Dalbergia stevensonii* by introducing the necessary training and tools to the Forest Department, CITES authorities, industry, and local communities to implement sustainable forestry. The over harvesting of high-value timber trees in tropical forests leads to other major problems such as biodiversity degradation and reduces forest value which ultimately contributes to increasing vulnerability to deforestation. Another major derivative problem resulting from over harvesting is an overall increase in poverty over the longer-term. The rapid short-term income gains from over harvesting are soon followed by a drastic and prolonged shortage in income opportunity for forest dependent people as the stocks of timber and other forest goods and services rapidly decline and remain low for decades.

The two timber species in Belize listed on CITES Appendix II, *Swietenia macrophylla* and *Dalbergia stevensonii*, provide economic benefits for two different sectors of the population due to their occurrence in geographically distinct sub-regions of the country. *Swietenia macrophylla* occurs mostly in the limestone forests of the northern half of the country and is exploited on an industrial scale by large timber companies, while *Dalbergia stevensonii* occurs mainly in the wet, sedimentary soils of the south and is exploited mainly by indigenous forest-dependent communities. Despite the economic benefits provided by these two species, there were no concrete, science-based management protocols to prevent over-harvesting. The Belize Forest Department and other stakeholders have recognized the need to initiate controls on harvesting that are science-based and provide options for continued income generation for industry as well

as indigenous forest-dependent communities. This project was focused on improving the management practices for *Swietenia macrophylla* and *Dalbergia stevensonii*, and contributed to the alleviation of poverty among forest dependent people through the building of capacity for sustainable timber management and the development of new forest management plans and annual plans for these communities.

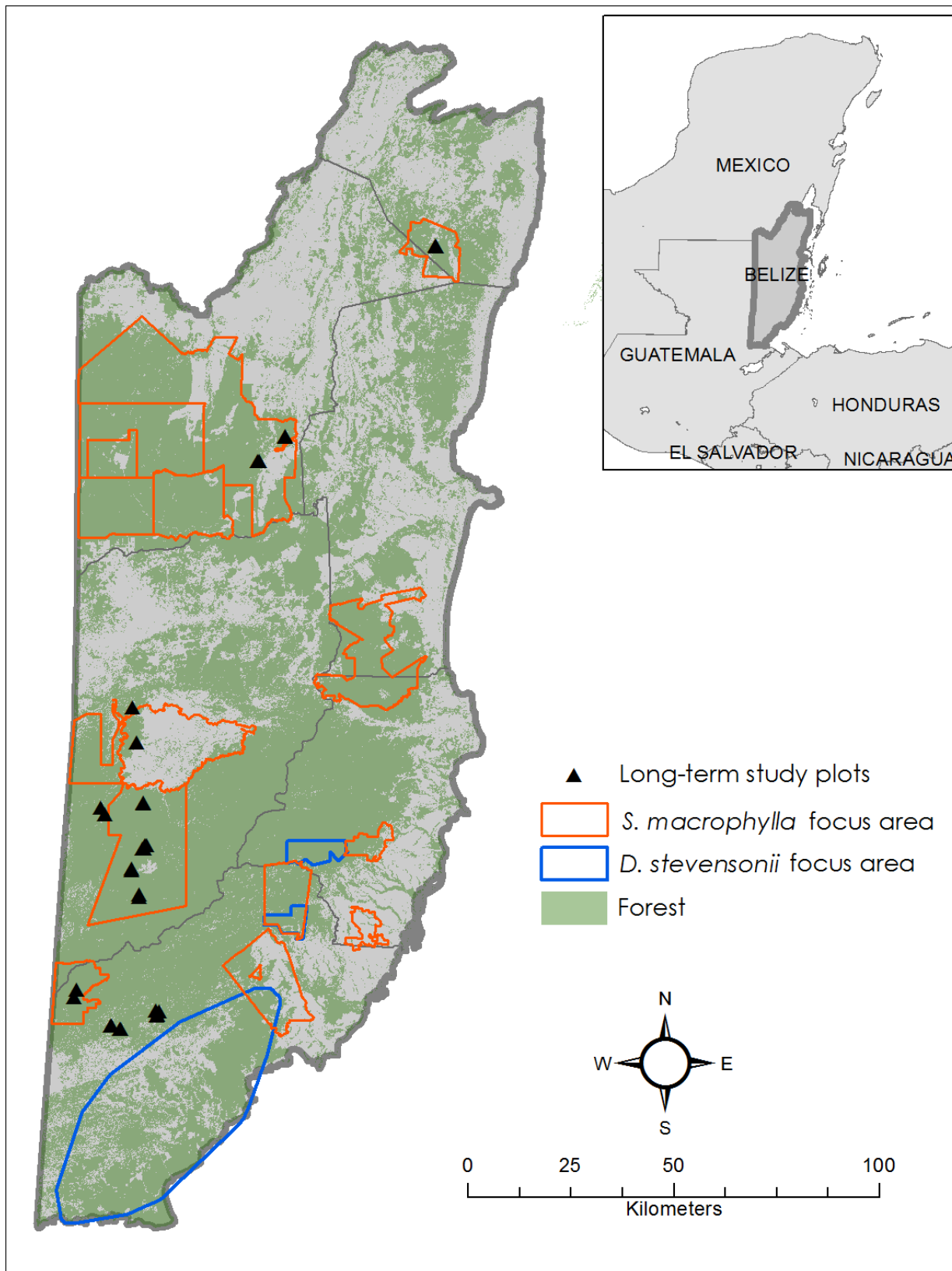


Figure 1. Map of the focus areas of the SUSFOR project. One of the primary objectives of the project is to enable the sustainable forest management of forests which are habitat for *S. macrophylla* (outlined in red) and *D. stevensonii* (outlined in blue), using a science-based approach involving the collection of long-term population dynamics data from study plots.

2 Project Partnerships

Oxford University (lead institution) was the scientific lead on the project as well as the administrative lead in terms of the management of DI funds. The university worked closely with the Belize Forest Department and the University of Belize – Environmental Research Institute in carrying out project activities. The relationship was particularly solidified through the secondment of a Forestry Officer from the Belize Forest Department to the project as a Post-doctoral Research Associate employed by Oxford University. This post was not filled until December 2014.

The University of Belize – Environmental Research Institute partnered with Oxford University and the Forest Department to assist in carrying out elements of the project involving monitoring of long-term forest plots and taxonomical research for the purposes of building capacity to identify forest tree species and was provided with a Darwin Forest Biologist under the project to work on project activities. Due to shortcomings in finding suitably qualified candidates, the position was not filled until year 2 of the project when a short term contract was issued for the position and filled from April 2015 to September 2015 by a candidate with a BSc (the position called for an MSc). The position became vacant again from October 2015 to January 2016, when it was again filled with another BSc candidate. The lack of a Forest Biologist on the project caused several delays in year 1 and 2, but the latter candidate held the position until the end of the project, and provided more long-term stability in carrying out the remainder of the project activities.

Project partnerships were forged out of a demand originating from the issues with lack of technical expertise and general knowledge concerning tropical timber species management, tree species taxonomy, and forest productivity in Belize. Each institution was particularly focused on one of these three issues but broadly focused on all three, and all institutions were to some extent involved in planning the different components of the project. The Belize Forest Department, as Convention Focal Point, was furthermore also heavily focused on leveraging the contribution of all institutions on the improvement of compliance with the Convention on International Trade in Endangered Species and the Convention on Biological Diversity.

Project partners were involved in the drafting of this final report.

3 Project Achievements

The SUSFOR project has achieved its planned outputs in spite of some human resource constraints during the project life cycle. The momentum behind the project and its successful outcomes is directly attributed to an in-country demand for the types of data, know-how, and technical capacity that the project delivered to stakeholders.

3.1 Outputs

Output 1 – Training courses in sustainable forestry, yield models, making non-detriment findings and sharing and reporting forest information effectively. Operational committee of stakeholders for the sharing of forest information in support of sustainable forest management.

Before the SUSFOR project there were no locally spearheaded and executed training courses to build capacity in sustainable forestry, yield models, non-detriment findings and reporting and sharing forest information. This project completely reversed that with an effective series of trainings that have to this day been appreciated by all who participated and received capacity through new knowledge and skills. A total of 8 training courses involving 95 trainees over the course of 14 days were carried during this reporting period (eg Annex 12). Photographs of trainees and agendas for the courses are provided as evidence of the achievement of this

output. Trainings touched on 5 out of 5 topical training themes. Another means of verification of the achievement of output 1 is the publication of two reports for the CITES MA and SA in making non-detrimental findings. The first report, which details the non-detriment finding process for *Swietenia macrophylla* is attached in the Annex 1. The second report which details the non-detriment finding for *Dalbergia stevensonii* is attached in Annex 2.

Stakeholders were identified to sit on the committee for the sharing of forest information in support of sustainable forest management. While the committee was not physically instituted and named as such due to individual time constraints affecting willingness to attend frequent meetings in base location and establish articles of association (as risk identified in assumption 1), the group did meet on more than one occasion during the lifetime of the project to discuss and agree on forest information and updates to the project outputs such as the yield models. An email chain was started and this was the means by which the committee members were kept abreast and discussed matters relating to the sharing of forest information in support of sustainable forest management. The email chain continues to this day. Members include Ramon Pacheco and Denham Chuc of the Programme for Belize, Mr. Oswaldo Sabido of Yalbac Ranch and Cattle Corporation, Dr. Elma Kay of the UB-ERI, Denver Cayetano of the UB-ERI, German Lopez of the Belize Forest Department, Allan Jeal of the Gallon Jug Lumber Corporation, Amin Bedran and Nidia Panti of the Bullridge Company Ltd, Martin Cus of the Sarstoon-Temash Institute for Indigenous Management, Earl Green of the Belize CITES SA, and Heron Moreno of the Corozal Sustainable Futures Initiative. Evidence of this email chain is submitted in Annex 3.

Output 2 – A package for improved forest management including: completed population surveys; upgraded forest monitoring network and database; taxonomic manuals; growth and yield models; yield tools; allometric models; carbon flux models; carbon stocks of different forest types.

Before the SUSFOR project there were no current information on the population of the target species *S. macrophylla* and *D. stevensonii* in the project area. On *S. macrophylla*, information existed from the late 1990s and was not based on forest inventories rather on extraction volumes. Information on *D. stevensonii* was wholly lacking. The indicators which measure achievement of output 2 include the quantification of population and demographics of target species. By project end, the population of *D. stevensonii* was fully inventoried through a field inventory involving 249 plots in all areas where it was known to exist, and the population was fully characterised and a report prepared (Annex 4). Additional supporting data on tree ring-based growth rates for demographic studies have been collected based on samples cut from the ends of harvested logs. A new-long term sample plot has also been established in a *D. stevensonii* rich area to study species regeneration after logging and to assess the rate of population processes such as mortality and recruitment. *Swietenia macrophylla* populations were assessed in areas where it was commercially extracted and annual reports were produced by the companies using the population assessment tools and yield model produced for that purpose.

Another means of verification of the progress toward achieving output 2 is the upgrade of the forest plots in the monitoring network and the update of the database of re-measurements of long-term forest monitoring plots. The upgrade was completed of the 15 target plots and re-measurements were taken of all during the lifetime of the project. The data has been digitized and mostly inputted into the FORMNET-B (Forest Monitoring Network of Belize) database (Cho, et al 2013).

Another means of verification is the taxonomic manual that was developed for use in the plots (Annex 5).

The quantification of carbon stocks and fluxes was carried out through the installation of advanced measurement devices such as root cores, compartmentalized emissions experiments, dendrobands, soil and stem respiration collars and the use of an environmental gas monitor in the long-term monitoring plots to measure carbon fluxes. This data is currently

being analyzed at Oxford University for inclusion in a paper on global forest carbon fluxes. For evidence of this work photographs are presented in Annex 6.

Another means of verification of the achievement of this output is the realization and institutionalized use of the yield model tool for *S. macrophylla* and *D. stevensonii* developed by the SUSFOR project and now used by the Belize Forest Department and all timber concessionaires in Belize. This yield model tool was developed in Microsoft Excel and contains the specific growth and yield model for the species and the allometric models for calculation of volumes and biomass (Annex 16), both of which were developed by the SUSFOR project. The yield model tool is presented in Annex 7.

Output 3 – Reinforcement of CITES compliance regarding trade in *S. macrophylla* and *D. stevensonii*.

Before the SUSFOR project, there was much difficulty with developing export proposals that were compliant with CITES as there were no non-detriment findings to speak of, largely due to lack of the requisite information, tools and know-how with which to make non-detriment findings. The indicator which measures achievement of output 3 is the achievement of CITES compliant timber yields and exports. This indicator can be verified by communications from the CITES Scientific Authority in Belize which issues the notice of approval of export quotas. If contacted the CITES Scientific Authority of Belize may be willing to share the communication regarding the compliance of the 2015, 2016 and 2017 timber yields and export quotas for *Swietenia macrophylla*. Dr. Elma Kay (ekay@ub.edu.bz) is the current chair of the Mahogany Sub-committee and is the contact person. This indicator can also be verified by reports of meetings held with indigenous communities concerning the revision of management plans and implementation of sustainable yield systems to make them CITES-compliant (Annex 17). For evidence, contact can be made with Froyla Salam, Executive Director of the Sarstoon-Temash Institute for Indigenous Management, or Martin Cus, Community Mobilizer (communitymobilizer@satiim.org.bz), whose organization acted as a liaison between the SUSFOR project and two indigenous communities for work to revise their management plans. Finally, for means of verification of CITES compliant exports, reference can be made to the CITES website for records of Belize's exports during the project period.

Output 4 – Improvement in livelihoods of poor indigenous Maya communities involved in community forestry.

Before the SUSFOR project, the indigenous communities involved in timber harvesting had basic plans in place that provided very little practical guidance on sustainable harvest levels and techniques. The indicators which measure the achievement of output 4 include a comparison between baseline and end of project employment surveys. The baseline situation in the indigenous communities of Conejo and Santa Theresa to which the SUSFOR project provided technical assistance, was assessed by SATIIM. At the end of the project the communities were well on their way to formalizing their skills and management approaches, having been assisted with their revised management plans, capacity building through several trainings, and support to market their products. Another means of verification are the new community forestry plans which the SUSFOR project prepared for the communities. Evidence of this is presented in Annex 8.

Another means of verification is the database of indigenous para-technicians trained by the SUSFOR project presented in Annex 9.

3.2 Outcome

The outcome of the SUSFOR project is the advancement of institutional and communal knowledge and technical capacity in forest management which supports a shift to sustainable forestry, thereby reducing overharvesting and forest degradation, and promotes long-term

economic welfare. The outcome was achieved by the project with a marked increase in knowledge and capacity in stakeholders (Forest Department, CITES MA and SA, community logging groups, private sector timber companies, and related NGOs). As a result of the SUSFOR project, all long-term logging concessions now adhere to SFM principles that have been enacted through the use of data, tools and methods developed by the project. The indigenous communities benefiting from the project (Annex 17) have all now found it much easier and cheaper to carry out sustainable logging using indigenous manpower and capacity. The achievement of the outcome is measured by the following:

(i) an increase in technical capacity in private sector and community forest management organizations as well as CITES MA and SA to carry out sustainable forestry and non-detrimental findings. There will be cross-sectoral/institutional knowledge and data sharing in support of sustainable forest management.

This measured achievement is verified by the noted improvement between the pre- and post-project annual plans of operations for sustainable logging. An example of pre- and post-project APOs is provided in Annexes 8 and 10. Prior to the SUSFOR project there were no non-detriment findings for the target species. Now there is, as evidence in Annexes 1 and 2. Evidence of cross-sectoral institutional knowledge and data sharing is evidence in Annex 3 by the email thread of the ad-hoc committee.

(ii) logging concessions in Belize calculate CITES-compliant annual sustainable timber yields and estimate carbon footprint of annual logging. New timber yields reflect an improvement from pre-project state.

This outcome is verified by the use of the SUSFOR-developed sustainable yield model by all companies and communities conducting sustainable logging in Belize, as demonstrated in the various training photos and as demonstrated by the improved APOs, attached in the Annexes. Evidence for this outcome is also included in Annex 11 which demonstrate the post-harvest assessment tool that was developed by the SUSFOR project and in current use by the Forest Department and the timber companies to assess their improvement in sustainable practices over time. Although peer reviewed publications were planned and analyses carried out, none have yet been drafted in manuscript form. This is still on the agenda.

(iii) indigenous Maya communities and private-sector companies are able to produce CITES-compliant wood for export, with export arrangements between private-sector and community produces in place.

This is verifiable by the attainment of CITES export permits by indigenous communities and private sector companies in a systematic and predictable manner due to the wealth of data and tools now at the fingertips of the companies and the CITES MA and SA. The CITES SA can be contacted via addresses provided elsewhere in the document to attest to this indicator. The email thread attached in Annex 3 is evidence of the virtual operationalization of the committee

(iv) there are improvements in livelihoods of indigenous Maya communities as it pertains to timber harvesting through diversification of income sources (Annex 17), reduction in overhead costs of logging, and more stable income flow over the long term. The number of indigenous Maya villagers conducting forest surveys as a source of income in their community increases from zero to 18 or more. A new indigenous community is engaged successfully in community forestry.

The means of verification of this outcome is the list of indigenous para-technicians went from zero before the project to four regular workers. This figure is further bolstered by the over a dozen more workers trained and who worked in concessions but do not represent permanent capacity as they have shown high turnover. Being able to work in their own concession rather than contracting out the work to outsiders has led to reduction in overhead costs and more income for these para-technicians. Contact can be made with SATIIM at the address provided elsewhere in this report to further verify this indicator. A new community forestry plan was developed for communities as evidenced in the Annexes.

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

The SUSFOR project contributed to a higher level outcome, known as impact, which is described as: Compliance with CITES and CBD is increased in Belize through the strengthening of sustainable forest management, with greater recognition for the carbon role of forests and increased benefits for forest-dependent people.

Compliance with CITES and the CBD was very much increased through the SUSFOR project with Belize being the first country to derive a *D. stevensonii* non-detriment finding as required by the CITES convention. Belize's exports of *D. stevensonii* and *S. macrophylla* are now fully CITES compliant due to the various technical and scientific interventions of the SUSFOR project as described throughout this report and evidenced in the Annexes.

This project provided the first national assessment of populations of these timber species. The toolkits and yield models developed by the project will outlast the project duration and will continue to be improved upon over the years. This project built the necessary technical capacity in local folks to ensure the long-term survival of forest monitoring efforts.

The data on forest dynamics and carbon stocks and fluxes have been picked up and incorporated into the World Bank funded REDD+ project to develop Belize's first ever Forest Emissions Reference Level. This will be presented to the UNFCCC in 2019/2020.

The long-term benefits for indigenous people is the improvement in their technical capacity to engage in forest management and to derive a source of income from it, according to international standards and requirements, yet taking into account customary and traditional use. Poverty-stricken indigenous communities now benefit from sustainable harvesting as opposed to suffering the effects of long-term economic demise from over-harvesting.

The SUSFOR project is built Belizean capacity from within to improve the way forests are managed in Belize. Stakeholders received the project well and especially the CITES SA and MA were open to working closely with the project to improve compliance with CITES regulations, as is evident by the trainings and technical assistance provided by the SUSFOR project to the CITES MA and SA.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Contribution to Global Goals for Sustainable Development (SDGs)

The following Sustainable Development Goals are relevant to the SUSFOR according to the contributions made by the project as described below.

SDG 1 – No poverty – By training and instilling capacity in indigenous community members (Annex 17) for them to carry out skilled and technical forestry work, the community members are able to work in their own communal businesses and make sustainable income from their timber operation – something they were not able to do before the project due to lack of knowhow and technical capacity. Furthermore, the project provided the methods, data and knowledge to ensure their indigenous timber operation continues sustainably into the future, thereby helping to secure sustainable income through time.

SDG 5 – Gender equality – By affording each gender equal opportunity for employment in the project according to their technical capacity, the project has contributed to the long-standing drive for gender equality in Belize. The first forest biologist was female, and members of the forest research committee were female. Women had input at all stages in community consultations equally alongside the men in the indigenous villages.

SDG 8 – Decent work and economic growth – By providing technical skills needed for forestry survey and mapping in timber operations, the project provided the means for indigenous community members to find a decent source of work. Economic growth in the villages have been given a spur by injection of technical knowhow and experience in sustainable logging.

SDG 12 – Responsible consumption and production – By providing the means, methods and tools to support sustainable forestry in Belize, the project has directly contributed to responsible consumption and production of natural resources, being timber from natural forests.

SDG 13 – Climate action – By providing a means to quantify carbon fluxes from logged forests, the project has directly provided a means to recognize the importance of logged forests in the carbon cycle and provided the data to quantify the value of these forests as a carbon sink.

SDG 15 – Life on land – Through the outcomes of the project, life on land was improved as measured by increased compliance with CITES and CBD.

4.2 Project support to the Conventions or Treaties (CBD, CITES, Nagoya Protocol, ITPGRFA)

Making non-detrimental findings on exported tropical woods is essential to achieving the aims of Article IV of CITES; however, many range states, including Belize, struggled to develop comprehensive guidelines for tropical timber tree species. Some example guidelines developed by CITES (eg. MWG2 Doc. 7) are not fully implemented due to lack of national capacity in forest ecology and management and lack of supporting data such as species growth and mortality rates. CoP14 Doc. 64 (Rev. 1) directs range states to increase capacity building related to making non-detrimental findings and promote national synergies by establishing competent committees to support the Scientific Authority with data. Through the methods, tools and training instilled in stakeholders this project increased capacity to carry out stipulations of Article IV and gathered the requisite forest ecology data through project activities as evidenced in the Annexes to this report.

Article 7, 8, 10 and 12 of the CBD speaks to biodiversity identification and monitoring, protection of threatened natural populations, encouragement of sustainable customary use and promotion of public/private sector cooperation in sustainable management, and establishment of scientific research and training programmes for the identification, conservation and sustainable use of biodiversity, respectively. Through a rigid programme of work this project led to increased compliance with these CBD articles as they pertain to the management and conservation of tree species and forests.

The Forest department was the host institution for the project in Belize and is also the focal institution for both the CBD and CITES, and also benefited heavily from the project through training, data, and knowhow. The forest department has the institutional mandate to carry out the objectives of the conventions and thus is strengthened in its capacity to achieve the aims and objectives of CITES article IV and articles 7, 8, 10 and 12 of the CBD.

4.3 Project support to poverty alleviation

The Forest Department has decades of experience with indigenous communities wanting to profit from their communal timber resources. Requests typically come from individuals wanting to cut a few trees to pay student fees or cover medical expenses. With many community members making such requests, the risk of overharvesting increases. Recently communities have become more organized and have requested long-term timber concessions in their communal forests, but without sustainability criteria and tools to assist these communities, the result could simply be organized over-harvesting. This would not guarantee long-term economic benefits since the rate of harvest is unassessed and therefore sustainability cannot be guaranteed.

This project benefit poor indigenous communities by covering the cost of and carrying out the requisite technical and scientific studies needed to determine sustainable timber yields, it revised unsustainable management plans using sustainability criteria and models, and developed capacity in indigenous communities to seek means of income generation other than by selling timber, such as by working as skilled forestry workers in their own concessions, thereby reducing the payouts to outsourced expertise (Annex 17). This project also developed the capacity of indigenous communities to engage in forestry operations by developing management plans and fostering organizational development. Four indigenous communities

benefited with assistance, with around 6 households in each community directly involved in logging. Around 18 indigenous community members actually gained skills and worked in their concessions. Around four actually remained interested in the job thereafter and continued to work in their concessions as skilled forestry workers surveying trees. Increased intra-communal forestry capacity coupled with user-friendly yield models and methods reduced the reliance on outsourced expertise.

There were two dimensions of poverty in indigenous forest-dependent communities that the SUSFOR project addressed. First was the creation of new income opportunities from the work of the SUSFOR project, and second was greater income stability for communities involved in producing sustainable timber as a source of income.

Community members have been trained in a sustainable approach to harvesting trees that ensures future harvests of equal size and value are obtainable well into the future. This approach involved building capacity in communities to carry out their own pre-harvest surveys, representing a savings of \$7,000 BZD based on experience relayed to us by the Boom Creek Loggers Association this year. The Forest Department southern office in Toledo can be contacted to verify these statements, attn: officer-in-charge Raul Chun. Two other indigenous communities, having seen the progress made in Boom Creek and the benefits, engaged the SUSFOR project for technical assistance for revision of their management plan and training to carry out sustainable forestry. The savings made by building capacity within the villages to carry out survey work represent a direct injection of income into the communities.

4.4 Gender equality

The project operated mindful of gender equality objectives of both international donors and domestic law. Equal opportunity was provided for women to engage in jobs (vis a vis the forest biologist on the project who was a female), trainings and other forms of engagement via consultations.

There was continued involvement of female participants from several organizations including officers of the Forest Department, the Environmental Research Institute. In carrying out the re-measurements of permanent sample plots, both male and female field assistants were hired on a ratio of 1 female to 2 males. In the promotion of indigenous forestry community enterprises, the involvement of female community members was encouraged.

4.5 Programme indicators

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

Yes, the project provided capacity building particularly designed and catered to indigenous communities and their counterpart non-governmental organizations such as SATIIM. The skills learned lead to greater representation in management decisions and discussions.

- **Were any management plans for biodiversity developed?**

Yes, the project developed new management plans for indigenous forests based on newly available growth and yield data for forests, and developed a new format for presenting management plans (Annex 13), as well a new system for monitoring management effectiveness in timber concessions.

- **Were these formally accepted?**

Yes, the new format for presenting management plans was formally accepted by the Forest Department and the CITES SA and is in use currently. The new annual management plans were accepted for the indigenous forests. The new post-harvest assessment system for assessing management effectiveness of timber concessions was adopted by the Forest Department and all stakeholders and is currently in use.

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

All plans and tools and methods were developed based on evidence and data and then validated with participation of all stakeholders, including indigenous community members.

- **Were there any positive gains in household (HH) income as a result of this project?**

The opportunity for positive gain in household income was provided by the project.

- **How many HHs saw an increase in their HH income?**

It is estimated at least 6 households in indigenous communities saw a net increase in income as a result of the employable skills gained under this project.

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

It is estimated that the increase in household income was sizeable during the project period.

4.6 Transfer of knowledge

The project did not result in any formal qualifications via scholarships. However, the project team was entirely nationals. The main researcher was Belizean, employed as a post-doctoral researcher at Oxford University. The Forest Biologist was also Belizean. The knowledge generated was generated by Belizeans for Belizeans and resulted in major policy and methodological changes in the management of forests in Belize.

4.7 Capacity building

The main project researcher who was Belizean, went on to be promoted to Chief Executive Officer of the Ministry of Forestry, Fisheries, the Environment and Sustainable Development. The first female Forest Biologist was promoted to Forest Officer in the Forest Department. The second Forest Biologist is currently doing a short-term research at Oxford University directly resulting from this project. Various other field staff have gone on to be promoted to jobs in various conservation oriented organizations in Belize.

5 Sustainability and Legacy

The legacy of the SUSFOR project has been an important consideration from conception stage, and it was decided that all technical staff members of the project would be Belizean - and that there would be a very strong component of capacity building not from non-Belizean experts but from the Belizean staff members to other Belizean stakeholders and beneficiaries. The SUSFOR project made a name for itself among stakeholders in the timber industry and among the community forestry groups. The project has developed several tools and manuals that will long outlive the project as they now form integral parts of the process of sustainable forest management in Belize (Annex 14). The project has also re-ignited the interest of industry, government and other stakeholders in the long-term monitoring of forest through the restoration and re-measurement of the long-term forest monitoring plots. These plots have gone on to provide data to the country's REDD+ programme in its greenhouse gas inventory and projections of emissions levels.

Project resources will remain in country, mainly at the University of Belize – ERI to continue the research begun under the project.

6 Lessons learned

An important lesson learned from this experience is that the contribution and commitment of other project partners to fulfilling project tasks and adapting to unforeseen delays is critical for project success. All project partners played important roles in achieving progress toward project outputs this year. The usual project challenges existed – delays, infrequent monitoring, etc.

6.1 Monitoring and evaluation

The SUSFOR project used its partners as a means of peer-review of its activities to monitor and evaluate the project. To a certain extent, the CITES SA, acted as one of the first backstops to project monitoring and accountability as many of the actions of the project relate to the supporting the work of the CITES SA. Based on their successful implementation of the new QSETS manual and the issuance of Mahogany quotas, the project can be said to have made good achievements due to the monitoring function by the SA.

6.2 Actions taken in response to annual report reviews

Not aware of any feedback.

7 Darwin identity

The Darwin logo appeared on all presentations made by project staff domestically and abroad. Also the Darwin Initiative programme and logo was publicised and promoted at the 'brown bag' meetings held involving up and coming forest researchers in Belize. Videos are uploaded to the project's Youtube channel

(<https://www.youtube.com/channel/UCRYsdpeA9VxPr0qinZ7sZEQ/feed>) promoting different aspects of the SUSFOR project and the Darwin Initiative. These videos will attract a wide audience including students, researchers and conservation NGOs.

8 Finance and administration

8.1 Project expenditure

Project spend (indicative) since last annual report	2016/17 Grant (£)	2016/17 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL				

Staff employed (Name and position)	Cost (£)
Denver Cayetano (Forest Biologist)	
TOTAL	

Capital items – description	Capital items – cost (£)
None purchased during 2016/17	0

TOTAL	0
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Other items – description	Other items – cost (£)
None	0
TOTAL	0

8.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
Oxford University	
Belize Forest Department	
University of Belize Environmental Research Institute	
TOTAL	

Source of funding for additional work after project lifetime	Total (£)
University of Oxford – NERC Grant	
Belize Forest Department	
TOTAL	

8.3 Value for Money

The budget was worked out based on estimated costs of equipment, fuel, labour including a 3% per annum inflation rate. The cost of the work on the permanent plots was estimated from recent experience by the BFD staff member on the project, and so reflected the most updated and cost effective estimate for this type of work in Belize. For cost effectiveness all equipment and consumables were sourced in Belize, except where not possible, for example some carbon flux and permanent forest plot measurement equipment had to be sourced in the UK and shipped to Belize. Other capital equipment such as a project 4x4 were sourced in Belize from local dealerships. The 4x4 was procured with value for money in mind. To date it is still in excellent working condition due to the rugged nature of the 4x4 selected. Travel costs were round-trip on economy. Salaries were competitive and aimed at getting value for money from the most qualified candidate. Safeguards for protecting project equipment and resources were put in place for the duration of the project work, and all equipment are still in excellent working condition.

The work done under the project represents good value for money because it achieved outputs that will be long-lasting and will be enshrined in institutional procedures. For example, it developed toolkits and procedures used by the CITES management and scientific authorities to make non-detrimental findings. Another example of long-lasting value is the collection and sharing of new data and knowledge on species ecology never before available. Furthermore, new permanent forest monitoring plots were established and will remain a constant source of data on species population dynamics and forest carbon dynamics needed to amend management prescriptions and yield models. The country's REDD+ programme requires long-term engagement in forest monitoring, and the long-term forest monitoring network enhanced under this project has contributed to the national REDD+ programme. Also, community forestry operations benefited from increased technical capacity through the development of easily implemented toolkits and procedures that now form the standard for any new community

forestry operation. The setting up of a committee of management, research and industry/community stakeholders to share knowledge and collectively engage in the development of standards related to the implementation of articles of the CITES and CBD conventions allows the distribution of capacity and benefits from this project well into the future. Finally, because the knowledge, tools and resources were developed on a first-hand basis by the Forest Department under this project, they were more readily assimilated into the Department's work, thereby securing value for money.

Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Impact:</p> <p>Compliance with CITES and CBD is increased in Belize through the strengthening of sustainable forest management, with greater recognition for the carbon role of forests and increased benefits for forest-dependent people.</p>			
<p>Outcome:</p> <p>The advancement of institutional and communal knowledge and technical capacity in forest management supports a shift to sustainable forestry which reduced overharvesting and forest degradation and promotes long-term economic welfare.</p>	<p>Indicator 1 - By the end of year one, technical capacity is increased in private-sector and community forest management organizations as well as CITES MA and SA to carry out sustainable forestry and non-detrimental findings, respectively. Cross-sectoral/institutional knowledge and data sharing in support of sustainable forest management.</p> <p>Indicator 2 - By year two, logging concessions in Belize begin to calculate CITES-compliant annual sustainable yields and estimate carbon footprint of annual logging. New timber yields reflect an improvement (possible reduction) from pre-project state.</p> <p>Indicator 3 - By end of year two, indigenous Maya communities and private-sector companies are able to produce CITES-compliant wood for export, with export arrangements between private-sector and community producers in place by year three.</p> <p>Indicator 4 - By end of year two,</p>	<p>Indicator 1 - Baseline and end of project Annual plan of operations compared and analysed. Baseline and end of project non-detrimental reports from CITES MA/SA compared and analysed. Committee meeting minutes.</p> <p>Indicator 2 - Film available for dissemination showing communities and companies conducting own forest surveys and yield calculation. Annual plan of operations reflecting sustainable yield and carbon footprint of logging. Peer-reviewed publications. Baseline and end of project timber yield compared and analysed. Post-harvest assessments.</p> <p>Indicator 3 - Baseline and end of project CITES export permits compared and analysed. Committee meeting minutes.</p>	<p>Assumption 1 - Project partners and stakeholders are able to work together and communicate effectively.</p> <p>Assumption 2 - Project manager is able to be seconded to the project.</p> <p>Assumption 3 - Target indigenous communities remain open to working with the project.</p>

	livelihoods of poor indigenous Maya communities improves through additional income generation opportunities, reduction of overhead costs and income security. The number of indigenous Maya villagers conducting forest surveys independently in their communal concessions increases from zero to 18 or more. A new indigenous community is engaged successfully in community forestry.	Indicator 4 - Baseline and end of project employment surveys compared and analysed. New community forestry plan.	Assumption 4 - The government remains a committed signatory to CITES and CBD and continues to support forest research. Assumption 5 - Natural disasters such as hurricanes do not impact long-term plots and forest management areas during the project.
Outputs: 1. Training courses in sustainable forestry, yield models, making non-detrimental findings and sharing and reporting forest information effectively. Operational committee of stakeholders for the sharing of forest information in support of sustainable forest management.	Indicator 1 - Number of training courses and number of attendees. Indicator 2 - Number of meetings and attendees at stakeholder committee meetings.	Reports, attendance sheets and videos from training workshops. Published report on making non-detrimental findings in Belize.	Stakeholders are willing to participate in trainings and can communicate effectively and willing to share data.
2. A package for improved forest management including: completed population surveys; upgraded forest monitoring network and database; taxonomic manuals; growth and yield models; yield tools; allometric models; carbon flux models; carbon stocks of different forest types.	Indicator 1 - Population and demographics of target species are quantified. Indicator 2 - Carbon stocks and fluxes of different forest types are quantified.	Databases, reports, spreadsheet tools, allometric models.	<i>S. macrophylla</i> and <i>D. stevensonii</i> are not black-listed before project outputs are realized.
3. Reinforcement of CITES compliance regarding trade in <i>S. macrophylla</i> and <i>D. stevensonii</i> .	Indicator 1 - Timber yields and exports comply with CITES.	CITES country report. Revised harvesting plans. Communications from the CITES secretariat.	Same as above.
4. Improvement in livelihoods of poor indigenous Maya communities	Indicator 1 - Baseline and end of project employment surveys	Database of para-technicians. Interview reports. Short videos.	Indigenous communities remain committed to sustainable forest

involved in community forestry.	compared and analysed. New community forestry plan.		management and are willing to participate in the project.
<p>Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)</p> <p>Activity 1.1. Training of private sector/community forest managers in (a) sustainable forestry standards, (b) forest survey techniques, (c) use of yield models, (d) long-term forest monitoring, and (e) effective reporting and publication of forest research/data.</p> <p>Activity 1.2. Develop guidelines, fitted into the national context, for making non-detrimental findings.</p> <p>Activity 1.3. Training of CITES MA and SA in (a) use of yield models, (b) making non-detrimental findings.</p> <p>Activity 1.4. Engage stakeholders and set up committee for the sharing of forest information in support of sustainable forest management.</p> <p>Activity 1.5. Production of videos of training events for dissemination and public awareness.</p> <p>Activity 2.1. Conduct population surveys of target species in protected areas.</p> <p>Activity 2.2. Re-measure and restore 15 long-term forest monitoring plots.</p> <p>Activity 2.3. Intensively measure 6 long-term forest monitoring plots to estimate carbon flux.</p> <p>Activity 2.4. Produce taxonomic guide of timber tree species of Belize.</p> <p>Activity 2.5. Develop growth and yield models and spreadsheet tool.</p> <p>Activity 2.6. Develop local allometric model for carbon stock estimation and re-analyse nationwide forest inventory data to estimate forest carbon stocks.</p> <p>Activity 2.7. Produce report on population assessment and forest carbon stocks.</p> <p>Activity 2.8. Production of film showing methods used by communities and companies conducting own forest surveys and yield calculation.</p> <p>Activity 3.1. Provide technical input for the revision of community forestry harvesting plans.</p> <p>Activity 3.2. Provide technical input into the CITES country report, section on <i>S. macrophylla</i> and <i>D. stevensonii</i>.</p> <p>Activity 3.3. Develop and promote non-competitive export facilitation between private-sector and indigenous community forestry operations.</p> <p>Activity 4.1. Develop database of indigenous Maya para-technicians.</p> <p>Activity 4.2. Community-based workshops in sustainable forestry and organizational capacity building for forest management.</p> <p>Activity 4.3. Production of film showing social and ecological benefits of community forestry and carbon conservation.</p>			

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

Project summary	Measurable Indicators	Progress and Achievements
<p>Impact:</p> <p>Compliance with CITES and CBD is increased in Belize through the strengthening of sustainable forest management, with greater recognition for the carbon role of forests and increased benefits for forest-dependent people.</p>		<p>Compliance with CITES and the CBD was very much increased through the SUSFOR project with Belize being the first country to complete a <i>D. stevensonii</i> non-detriment finding as required by the CITES convention. Belize's exports of <i>D. stevensonii</i> and <i>S. macrophylla</i> are now fully CITES compliant due to the various technical and scientific interventions of the SUSFOR project as described throughout this report and evidenced in the Annexes.</p> <p>This project provided the first national assessment of populations of these timber species. The toolkits and yield models developed by the project will outlast the project duration and will continue to be improved upon over the years. This project built the necessary technical capacity in local folks to ensure the long-term survival of forest monitoring efforts.</p> <p>The data on forest dynamics and carbon stocks and fluxes have been picked up and incorporated into the World Bank funded REDD+ project to develop Belize's first ever Forest Emissions Reference Level. This will be presented to the UNFCCC in 2019/2020.</p> <p>The long-term benefits for indigenous people is the improvement in their technical capacity to engage in forest management and to derive a source of income from it, according to international standards and requirements, yet taking into account customary and traditional use. Poverty-stricken indigenous communities now benefit from sustainable harvesting as opposed to suffering the effects of long-term economic demise from over-harvesting.</p> <p>The SUSFOR project is built Belizean capacity from within to improve the way forests are managed in Belize. Stakeholders received the project well and especially the CITES SA and MA were open to working closely with the project to improve compliance with CITES regulations, as is evident by the trainings and technical assistance provided by the SUSFOR project to the CITES MA and SA.</p>
<p>Outcome</p> <p>The advancement of institutional and communal knowledge and technical capacity in forest management supports a shift to sustainable</p>	<p>Indicator 1 - By the end of year one, technical capacity is increased in private-sector and community forest management organizations as well as CITES MA and SA to carry out sustainable forestry and non-</p>	<p>The outcome was achieved by the project with a marked increase in knowledge and capacity in stakeholders (Forest Department, CITES MA and SA, community logging groups, private sector timber companies, and related NGOs). As a result of the SUSFOR project, all long-term logging concessions now adhere to SFM principles that have been enacted through the use of data, tools and methods developed by the project. The indigenous</p>

<p>forestry which reduced overharvesting and forest degradation and promotes long-term economic welfare.</p>	<p>detrimental findings, respectively. Cross-sectoral/institutional knowledge and data sharing in support of sustainable forest management.</p> <p>Indicator 2 - By year two, logging concessions in Belize begin to calculate CITES-compliant annual sustainable yields and estimate carbon footprint of annual logging. New timber yields reflect an improvement (possible reduction) from pre-project state.</p> <p>Indicator 3 - By end of year two, indigenous Maya communities and private-sector companies are able to produce CITES-compliant wood for export, with export arrangements between private-sector and community producers in place by year three.</p> <p>Indicator 4 - By end of year two, livelihoods of poor indigenous Maya communities improves through additional income generation opportunities, reduction of overhead costs and income security. The number of indigenous Maya villagers conducting forest surveys independently in their communal concessions increases from zero to 18 or more. A new indigenous community is engaged successfully</p>	<p>communities benefiting from the project have all now found it much easier and cheaper to carry out sustainable logging using indigenous manpower and capacity. The achievement of the outcome is measured by the following in relation to the respective indicator:</p> <p>(1) an increase in technical capacity in private sector and community forest management organizations as well as CITES MA and SA to carry out sustainable forestry and non-detrimental findings. There will be cross-sectoral/institutional knowledge and data sharing in support of sustainable forest management.</p> <p>This measured achievement is verified by the noted improvement between the pre- and post- project annual plans of operations for sustainable logging. An example of pre- and post- project APOs is provided in Annexes 8 and 10. Prior to the SUSFOR project there were no non-detriment findings for the target species. Now there is, as evidence in Annexes 1 and 2. Evidence of cross-sectoral institutional knowledge and data sharing is evidence in Annex 3 by the email thread of the ad-hoc committee.</p> <p>(2) logging concessions in Belize calculate CITES-compliant annual sustainable timber yields and estimate carbon footprint of annual logging. New timber yields reflect an improvement from pre-project state.</p> <p>This outcome is verified by the use of the SUSFOR-developed sustainable yield model by all companies and communities conducting sustainable logging in Belize, as demonstrated in the various training photos and as demonstrated by the improved APOs, attached in the Annexes. Evidence for this outcome is also included in Annex 11 which demonstrate the post-harvest assessment tool that was developed by the SUSFOR project and in current use by the Forest Department and the timber companies to assess their improvement in sustainable practices over time. Although peer reviewed publications were planned and analyses carried out, none have yet been drafted in manuscript form. This is still on the agenda.</p> <p>(3) indigenous Maya communities and private-sector companies are able to produce CITES-compliant wood for export, with export arrangements between private-sector and community produces in place.</p> <p>This is verifiable by the attainment of CITES export permits by indigenous communities and private sector companies in a systematic and predictable manner due to the wealth of data and tools now at the fingertips of the companies and the CITES MA and SA. The CITES SA can be contacted via addresses provided elsewhere in the document to attest to this indicator.</p>
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	<p>in community forestry.</p>	<p>The email thread attached in Annex 3 is evidence of the virtual operationalization of the committee</p> <p>(4) there are improvements in livelihoods of indigenous Maya communities as it pertains to timber harvesting through diversification of income sources, reduction in overhead costs of logging, and more stable income flow over the long term. The number of indigenous Maya villagers conducting forest surveys as a source of income in their community increases from zero to 18 or more. A new indigenous community is engaged successfully in community forestry.</p> <p>The means of verification of this outcome is the list of indigenous para-technicians went from zero before the project to four regular workers. This figure is further bolstered by the over a dozen more workers trained and who worked in concessions but do not represent permanent capacity as they have shown high turnover. Being able to work in their own concession rather than contracting out the work to outsiders has led to reduction in overhead costs and more income for these para-technicians. Contact can be made with SATIIM at the address provided elsewhere in this report to further verify this indicator. A new community forestry plan was developed for communities as evidenced in the Annexes.</p>
<p>Output 1. Training courses in sustainable forestry, yield models, making non-detrimental findings and sharing and reporting forest information effectively. Operational committee of stakeholders for the sharing of forest information in support of sustainable forest management.</p>	<p>Indicator 1 - Number of training courses and number of attendees.</p> <p>Indicator 2 - Number of meetings and attendees at stakeholder committee meetings.</p>	<p>Before the SUSFOR project there were no locally spearheaded and executed training courses to build capacity in sustainable forestry, yield models, non-detriment findings and reporting and sharing forest information. This project completely reversed that with an effective series of trainings that to this day are still appreciated by all who participated and received capacity through new knowledge and skills. A total of 8 training courses involving 95 trainees over the course of 14 days were carried during this reporting period. Photographs of trainees and agendas for the courses are provided as evidence of the achievement of this output. Trainings touched on 5 out of 5 topical training themes. Another means of verification of the achievement of output 1 is the publication of two reports for the CITES MA and SA in making non-detrimental findings. The first report, which details the non-detriment finding process for <i>Swietenia macrophylla</i> is attached in the Annex 1. The second report which details the non-detriment finding for <i>Dalbergia stevensonii</i> is attached in Annex 2.</p> <p>Stakeholders were identified to sit on the committee for the sharing of forest information in support of sustainable forest management. While the committee was not physically instituted and named as such due to individual</p>

		<p>time constraints affecting willingness to attend frequent meetings in base location and establish articles of association (as risk identified in assumption 1), the group did meet on more than one occasion during the lifetime of the project to discuss and agree on forest information and updates to the project outputs such as the yield models. An email chain was started and this was the means by which the committee members were kept abreast and discussed matters relating to the sharing of forest information in support of sustainable forest management. The email chain continues to this day. Members include Ramon Pacheco and Denham Chuc of the Programme for Belize, Mr. Oswaldo Sabido of Yalbac Ranch and Cattle Corporation, Dr. Elma Kay of the UB-ERI, Denver Cayetano of the UB-ERI, German Lopez of the Belize Forest Department, Allan Jeal of the Gallon Jug Lumber Corporation, Amin Bedran and Nidia Panti of the Bullridge Company Ltd, Martin Cus of the Sarstoon-Temash Institute for Indigenous Management, Earl Green of the Belize CITES SA, and Heron Moreno of the Corozal Sustainable Futures Initiative. Evidence of this email chain is submitted in Annex 3.</p>
<p>Activity 1.1. Training of private sector/community forest managers in (a) sustainable forestry standards, (b) forest survey techniques, (c) use of yield models, (d) long-term forest monitoring, and (e) effective reporting and publication of forest research/data.</p>		<p>All trainings completed.</p>
<p>Activity 1.2. Develop guidelines, fitted into the national context, for making non-detrimental findings.</p>		<p>Completed.</p>
<p>Activity 1.3. Training of CITES MA and SA in (a) use of yield models, (b) making non-detrimental findings.</p>		<p>Completed.</p>
<p>Activity 1.4. Engage stakeholders and set up committee for the sharing of forest information in support of sustainable forest management.</p>		<p>Somewhat completed.</p>
<p>Activity 1.5. Production of videos of training events for dissemination and public awareness.</p>		<p>Not so completed. This is still being worked out since project closure.</p>
<p>Output 2. A package for improved forest management including: completed population surveys; upgraded forest monitoring network and database; taxonomic manuals; growth and yield models; yield tools;</p>	<p>Indicator 1 - Population and demographics of target species are quantified. Indicator 2 - Carbon stocks and fluxes of different forest types are</p>	<p>Before the SUSFOR project there were no current information on the population of the target species <i>S. macrophylla</i> and <i>D. stevensonii</i> in the project area. On <i>S. macrophylla</i>, information existed from the late 1990s and was not based on forest inventories rather on extraction volumes. Information on <i>D. stevensonii</i> was wholly lacking. The indicators which measure achievement of output 2 include the quantification of population and</p>

<p>allometric models; carbon flux models; carbon stocks of different forest types.</p>	<p>quantified.</p>	<p>demographics of target species. By project end, the population of <i>D. stevensonii</i> was fully inventoried through a field inventory involving 249 plots in all areas where it was known to exist, and the population was fully characterised and a report prepared (Annex 4). Additional supporting data on tree ring-based growth rates for demographic studies have been collected based on samples cut from the ends of harvested logs. A new-long term sample plot has also been established in a <i>D. stevensonii</i> rich area to study species regeneration after logging and to assess the rate of population processes such as mortality and recruitment. <i>Swietenia macrophylla</i> populations were assessed in areas where it was commercially extracted and annual reports were produced by the companies using the population assessment tools and yield model produced for that purpose.</p> <p>Another means of verification of the progress toward achieving output 2 is the upgrade of the forest plots in the monitoring network and the update of the database of re-measurements of long-term forest monitoring plots. The upgrade was completed of the 15 target plots and re-measurements were taken of all during the lifetime of the project. The data has been digitized and mostly inputted into the FORMNET-B (Forest Monitoring Network of Belize) database (Cho, et al 2013).</p> <p>Another means of verification is the taxonomic manual that was developed for use in the plots (Annex 5).</p> <p>The quantification of carbon stocks and fluxes was carried out through the installation of advanced measurement devices such as root cores, compartmentalized emissions experiments, dendrobands, soil and stem respiration collars and the use of an environmental gas monitor in the long-term monitoring plots to measure carbon fluxes. This data is currently being analyzed at Oxford University for inclusion in a paper on global forest carbon fluxes. For evidence of this work photographs are presented in Annex 6.</p> <p>Another means of verification of the achievement of this output is the realization and institutionalized use of the yield model tool for <i>S. macrophylla</i> and <i>D. stevensonii</i> developed by the SUSFOR project and now used by the Belize Forest Department and all timber concessionaires in Belize. This yield model tool was developed in Microsoft Excel and contains the specific growth and yield model for the species and the allometric models for calculation of volumes and biomass, both of which were developed by the SUSFOR project. The yield model tool is presented in Annex 7.</p>
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Activity 2.1. Conduct population surveys of target species in protected areas.	Completed.
Activity 2.2. Re-measure and restore 15 long-term forest monitoring plots.	Completed.
Activity 2.3. Intensively measure 6 long-term forest monitoring plots to estimate carbon flux.	5 plots were monitored. The 6 th was thought to be too expensive and logistically challenging to handle alongside the 5.
Activity 2.4. Produce taxonomic guide of timber tree species of Belize.	Completed.
Activity 2.5. Develop growth and yield models and spreadsheet tool.	Completed.
Activity 2.6. Develop local allometric model for carbon stock estimation and re-analyse nationwide forest inventory data to estimate forest carbon stocks.	Somewhat completed.
Activity 2.7. Produce report on population assessment and forest carbon stocks.	Mostly completed.
Activity 2.8. Production of film showing methods used by communities and companies conducting own forest surveys and yield calculation.	Not so completed. Still being worked on after project closure.
Output 3. Reinforcement of CITES compliance regarding trade in <i>S. macrophylla</i> and <i>D. stevensonii</i> .	<p>Indicator 1 - Timber yields and exports comply with CITES.</p> <p>Before the SUSFOR project, there was much difficulty with developing export proposals that were compliant with CITES as there were no non-detriment findings to speak of, largely due to lack of the requisite information, tools and know-how with which to make non-detriment findings. The indicator which measures achievement of output 3 is the achievement of CITES compliant timber yields and exports. This indicator can be verified by communications from the CITES Scientific Authority in Belize which issues the notice of approval of export quotas. If contacted the CITES Scientific Authority of Belize may be willing to share the communication regarding the compliance of the 2015, 2016 and 2017 timber yields and export quotas for <i>Swietenia macrophylla</i>. Dr. Elma Kay (ekay@ub.edu.bz) is the current chair of the Mahogany Sub-committee and is the contact person. This indicator can also be verified by reports of meetings held with indigenous communities concerning the revision of management plans and implementation of sustainable yield systems to make them CITES-compliant. For evidence, contact can be made with Froyla Salam, Executive Director of the Sarstoon-Temash Institute for Indigenous Management, or Martin Cus, Community Mobilizer (communitymobilizer@satiim.org.bz), whose organization acted as a liaison between the SUSFOR project and two indigenous communities for work to revise their management plans. Finally, for means of verification of CITES compliant exports, reference can be made to the CITES website for records of Belize's exports during the project period.</p>

Activity 3.1. Provide technical input for the revision of community forestry harvesting plans.	Completed.
Activity 3.2. Provide technical input into the CITES country report, section on <i>S. macrophylla</i> and <i>D. stevensonii</i> .	Country Report not prepared yet.
Activity 3.3. Develop and promote non-competitive export facilitation between private-sector and indigenous community forestry operations.	Completed.
Output 4. Improvement in livelihoods of poor indigenous Maya communities involved in community forestry.	<p data-bbox="618 378 1115 520">Indicator 1 - Baseline and end of project employment surveys compared and analysed. New community forestry plan.</p> <p data-bbox="1126 378 2145 916">Before the SUSFOR project, the indigenous communities involved in timber harvesting had basic plans in place that provided very little practical guidance on sustainable harvest levels and techniques. The indicators which measure the achievement of output 4 include a comparison between baseline and end of project employment surveys. The baseline situation in the indigenous communities of Conejo and Santa Theresa to which the SUSFOR project provided technical assistance, was assessed by SATIIM. At the end of the project the communities were well on their way to formalizing their skills and management approaches, having been assisted with their revised management plans, capacity building through several trainings, and support to market their products. Another means of verification are the new community forestry plans which the SUSFOR project prepared for the communities. Evidence of this is presented in Annexes 8 and 10.</p> <p data-bbox="1126 836 2145 916">Another means of verification is the database of indigenous para-technicians trained by the SUSFOR project presented in Annex 9.</p>
Activity 4.1. Develop database of indigenous Maya para-technicians.	Completed.
Activity 4.2. Community-based workshops in sustainable forestry and organizational capacity building for forest management.	Completed.
Activity 4.3. Production of film showing social and ecological benefits of community forestry and carbon conservation.	Not so completed. Still being worked on post-project.

Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
Training Measures							
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						
4b	Number of training weeks provided to undergraduate students						
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)	82	Belizean	7 females 54 males	Forestry	English	
6b	Number of training weeks not leading to formal qualification	24					
7	Number of types of training materials produced for use by host country(s) (describe training materials)	8					Methods, powerpoints, reports, etc.

Research 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)	2					Rosewood NDF, Mahogany NDF, Community forestry management plans
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1					Taxonomy guide
11a	Number of papers published or accepted for publication in peer reviewed journals						
11b	Number of papers published or accepted for publication elsewhere	2					In prep.
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1					Species list accompany PSP database
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	1					FORMNET-B PSP database enhanced with new measurements
13a	Number of species reference collections established and handed over to host country(s)	1					Taxonomy guide for PSPs
13b	Number of species reference collections enhanced and handed over to host country(s)						

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	2					Annex 15
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	5					

Physical Measures		Total	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	16	15 abandoned plots were re-established. 1 new intensive monitoring plot was established in pine forest.

Financial 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		Belize				

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.	X
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.	X
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.	X
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.	X
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.	X
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.	X
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

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)
Report*	Rosewood NDF for Belize	Belizean	Belize	Male	Forest Department, Belmopan	

Annex 6 Darwin Contacts

Ref No	21-009
Project Title	Biodiversity conservation through poverty alleviation in Belize
Project Leader Details	
Name	Prof. Yadvinder Malhi
Role within Darwin Project	Project Lead
Address	
Phone	
Fax/Skype	
Email	
Partner 1	
Name	Percival Cho
Organisation	Ministry of Forestry
Role within Darwin Project	Post-doc
Address	
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Partner 2 etc.	
Name	Elma Kay
Organisation	University of Belize Environmental Research Institute
Role within Darwin Project	
Address	
Fax/Skype	
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Checklist for submission

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Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	X
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number.	
Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	