



## Darwin Initiative: Final Report

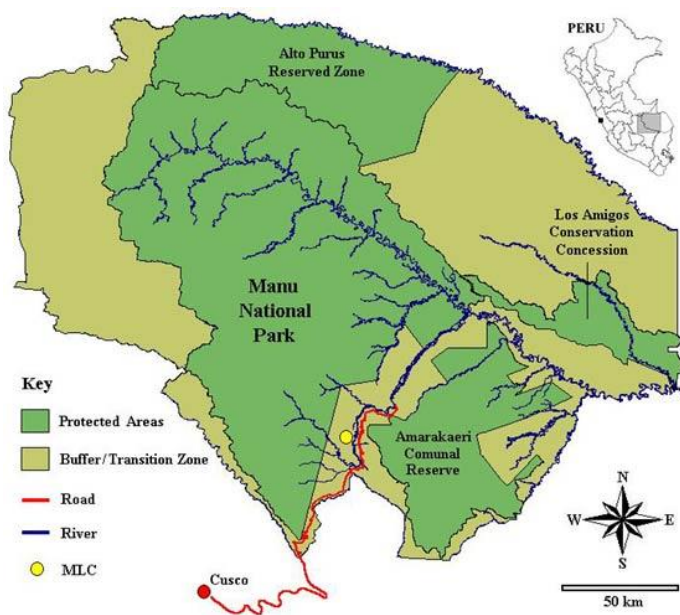
### Darwin Project Information

Project reference	22-003
Project title	Sustainable Manu: biodiversity conservation through sustainable development and rainforest regeneration
Host country(ies)	Peru
Contract holder institution	University of Glasgow
Partner institution(s)	Crees Foundation, Manu National Park and consortium of Peruvian and international expert partners
Darwin grant value	£289,728
Start/end dates of project	1/04/2015 to 31/03/2018
Project leader's name	Ross MacLeod
Project website/blog/Twitter	
Report author(s) and date	Ross Macleod (based on individual reports and data from lead Peruvian partner the Crees Foundation), Dec 2018

## 1 Project Rationale

The world's rainforests are vital for preserving global biodiversity and maintaining essential ecosystem and economic services. Yet a widespread perception exists that there is a fundamental conflict between the desire to conserve biodiversity in healthy rainforest ecosystems and the aspirations and needs of impoverished local peoples living in and around rainforests. The Amazon rainforest and, specifically, the Manu Biosphere Reserve UNESCO World Heritage site, exemplify this major global challenge of how to both preserve biodiversity and develop sustainably. Currently, local communities in Manu are forced to financially rely on destructive practices such as logging and unsustainable agriculture. The result is an unsustainable downward spiral of environmental degradation that both reduces rainforest biodiversity and decreases long-term economic returns for local people. Furthermore, areas that have experienced significant human disturbance are perceived (by both local people and conservation managers) as having little economic or conservation value. Due to this undervaluation of their current land, people living within buffer zones around Manu are driven to further exploit and encroach on primary rainforest for economic survival. If deforestation rates are not reversed, we risk losing over 40% of the Amazon rainforest in the next 35 years.

The Sustainable Manu project is located in the Manu Biosphere Reserve, a UNESCO World Heritage Site in the Amazon rainforest of SE Peru established because of the role it plays in protecting one of the most biodiverse areas of the world. As well as having a high global



conservation value, its forests hold huge stocks of carbon, influence weather patterns, maintain water quality in the region's rivers, reduce soil erosion, flooding and landslides (that can cut regional road and communication links) and provide many jobs related to tourism across the country. Within the Manu Biosphere Reserve surrounding its core protected areas lie what are designated cultural buffer zones. These areas are the focus of the Sustainable Manu project because they are home to thousands of local people, both indigenous and settlers, who live amongst a matrix of heavily disturbed forest and land cleared for agricultural practices. As in many tropical areas, over time subsistence agriculture becomes less successful as once rich

rainforest soils deteriorate and the remaining forest that once provided additional sources of food, clean water and building materials becomes more and more distant. For many marginalised local communities, survival and the economic resources to access health, education and resources in general becomes dependent on further land clearance, illegal logging, over-harvesting of natural resources or other environmentally destructive activities such as gold mining. The result is an unsustainable downward spiral of environmental degradation and decreasing economic returns that constantly drives people and communities further into primary rainforests, damaging or destroying the globally valuable ecosystem services they provide. Once forced into colonizing these fragile rainforest environments, local communities are forced to repeat the cycle of environmental destruction and decreasing economic prospects that accompanies unsustainable human exploitation.

## 2 Project Partnerships

The Sustainable Manu project was led by a formal partnership between the Institute of Biodiversity, Animal Health and Comparative Medicine (IBAHCM) at the University of Glasgow and the Crees Foundation, a Peruvian sustainable development and conservation research NGO (signed partnership agreement available on request). The Sustainable Manu project application was developed at the request of the Crees Foundation who led on project delivery in Peru, provided the focus for collaboration with the other Peruvian partners and prepared many of the materials that form the basis of this final report. The project was designed, built and the application jointly written by staff from the University of Glasgow and Crees. The project was also delivered with the support of Manu National Park, who are the primary protected area at the core of the wider Manu Biosphere Reserve within which the project works. The National Park management and staff are one of the primary audiences for the biodiversity monitoring data that has been collected to provide an evidence base for establishing the conservation value of the regenerating rainforests within and around the park. Project staff worked with the park management regularly in planning the biodiversity survey work, developing permit applications and sharing results. The project was also supported by a number of expert partners including La Molina National Agrarian University, Lima, Peru, Centro Binacional Peruano Norteamericano (CBPNA), Puerto Maldonado, Peru, School of Geography and the Environment, University of Oxford. These partners were not involved directly in the running of the project but instead provide sources of expertise whose advice was sought when the project encountered particular technical problems. La Molina provide advice on agro-forestry implementation, Oxford on the social-economic surveys and monitoring and CBPNA

were instrumental in the development of the environmental education approaches. With their director Carlos Arevalo working increasingly closely with the project on the educational side of the programmes over its course and eventually moving to Crees to become their Programme Director. The other partnership envisaged in the original application was with IESTP, a technical college in Manu, however as described in the year 1 report this partnership ended when the college decided to end its land management course as the result of local political considerations. A key development in terms of project partners was the building of new partnerships to replace IESTP in helping deliver the natural land management, eco-tourism, entrepreneurial and environmental awareness education goals of the project. The project established has a close working relationship with Jose Carlos Mariategui Collegio in Salvacion and in partnership with CBPNA, Crees successfully delivered 14 workshops covering the topics listed above and as a result the project was able to reach a much wider audience (Output 2 Indicator 1) than if the educational work had continued with IESTP. See section 3 for more discussion of associated activities and outputs.

Two new partnership relationships were developed over the course of the project. One with the Peruvian state agriculture development bank (Agrobanco), which started a microfinance service in the Manu Biosphere Reserve during the project, a series of collaborative meetings were held to explore how the project can use its expertise and experience in Manu to support the role out and successful implementation of this service for sustainably based business approaches across Manu and help the micro-enterprises developed during the project access this support. By the end of the project we were able to provide technical assistance to new agro-forestry participants to develop applications for support for the development of sustainable microenterprise after the Darwin funding ends. This work will continue after the end of the Darwin funding period. The second new partnership was with FONCODES, Peru's national social development fund supported by Peru's Ministry of Social Development and Inclusion (MIDIS). FONCODES showed considerable interest in building on the Sustainable Manu project's microenterprise approaches and experience and in particular in scaling up the biogarden enterprise approaches developed and tested by the project. The project has supported the development of 32 biogarden microenterprises with Darwin funding and FONCODES is now exploring options for increasing this 15 fold and using the project's technical knowledge to deliver 400+ new biogarden based enterprises. During the project the partnership with FONCODES was an informal one with the partners sharing expertise and providing training workshops while a more formal agreement for longer term cooperation between Crees and FONCODES was developed. Securing this agreement to scale up from 2019 the microenterprise initiatives started by the Sustainable Manu project will be an ideal addition to the planned exit strategy and will help delivery of additional long term impacts from the Darwin Initiative funding. The partnership with FONCODES was instrumental in allowing an expansion of microenterprise participants reached through the delivery of a business development workshop (Output 2 Activity 2.3).

### **3 Project Achievements**

#### **3.1 Outputs**

##### **Output 1: Quantification of the potential for micro-enterprise to reduce unsustainable use, or exploitation of primary rainforest forest habitat.**

Based on analysis of our household survey monitoring, micro-enterprise initiatives supported during the project provided full time occupations. With participants in 56 agriculture based enterprises (agro-forestry and biogardens) working on average 38 hours per week and with those involved in the 63 other micro-enterprises working 49 hours per week (Indicator 1). This compares to local people working as paid employees who, our household surveys showed, work on average 34 hours per week and people working in the logging industry involved with buying and selling of wood who worked 32 hours per week. In year 1 of the project, due to local sensitivity about answering detailed questions during household surveys on involvement in potentially illegal, unsustainable exploitation activities we realised we would not be able to accurately measure involvement in exploitation of primary rainforest directly and as highlighted in the year 1 report we changed to focusing on using the household surveys to quantify total

time available for other activities, which provides a conservative approach to identifying time available for less sustainable activities. We found that on average participants had 7.3 hours per week available for other activities (Indicator 2) and this had dropped by 16% over the course of involvement with their micro-enterprise initiatives. As travel into primary rainforest by participants from their current land would involve at best several hours of walking and sometimes a day of travel and another to return, these figures suggest there is little opportunity for unsustainable exploitation of primary rainforest by participants involved in micro-enterprise activities. In our target for Indicator 1 we had aimed for involvement in micro-enterprises to take 50% of working time and our target for Indicator 2 was for involvement in enterprises to reduce motivation and time to travel to primary forest areas. Although we could not measure exploitation levels directly we found that involvement in the micro-enterprises effectively took 100% of participants work time and the non-working free time was insufficient to allow regular exploitation of primary forest even if participants had been motivated to do so. We therefore feel Output 1 was achieved.

### **Output 2: Increased knowledge within the community of sustainable practices, natural land management, entrepreneurial skills, eco-tourism and local genetic resources.**

As described in Section 2 of this report (and in the annual reports) partnership envisaged in the original application was with IESTP, a technical college in Manu, ended when the college decided to end its land management course so instead the project ran a series 14 workshops covering the entrepreneurial and environmental education topics that would have been covered with the college. This training reached 265 members of the community rather than the original target of 60 participants (Indicator 1) and allowed us to focus on participants who could immediately started to use the training to develop micro-enterprises rather than having to complete a year of academic training before applying their new skills. We therefore felt this change was an improvement. 119 of the participants (Indicator 2 & Indicator 3 where target was 110, see logframe for breakdown by type of micro-enterprise) did apply and further develop their knowledge and skills by developing microenterprises supported by the project. Anecdotally other training participants also retained and applied their knowledge but as they weren't in regular contact with project staff we could not track this quantitatively. Participation in repeat monitoring surveys was a condition of participation in micro-enterprise support but would have been too long a commitment for those only wanting to attend training workshops. We therefore consider Output 2 was achieved.

### **Output 3: Increased participation in sustainable micro-enterprises and associated increased incomes within the local community.**

Microenterprise participation involved the development of 24 agroforestry, 32 biogarden, 26 eco-tourism guide and 37 general micro-enterprises (Indicator 2) by a total of 119 participants and this produced 588 direct beneficiaries (Indicator 1 Target 550, see logframe work for break down by microenterprise type). Additionally each general microenterprise support participant represented on average a business of 4 partners with on average 4.4 supported family members each. Therefore a further 488 people were likely additional beneficiaries but as they were not monitored using questionnaire surveys we have not included them in the confirmed direct beneficiary total. In the application for Indicator 2 we set likely targets of 50 agro-forestry enterprises (mostly carried out by local men), 30 bio-garden enterprises (mostly run by local women), 10 eco-tourism guide enterprises, and 20 other enterprises chosen by local communities. The 50 agro-forestry enterprises was chosen on the basis that the project would support the creation of micro-enterprises based on supporting the creation of 55 ha of agro-forestry plots based on a range of individual sizes from 1ha to 5 ha. In reality participants always chose the maximum size as this allowed them to work full time on their enterprises. Additionally there was much greater demand from the local communities for support in developing other forms of sustainable micro-enterprise. We therefore responded to local interest to reach the outlined numbers of each type of enterprise. This also meant we supported a much wider range of sustainable micro-enterprises that originally planned, 19 compared to the target of 6 in the application (see the Sustainable Manu technical report in Annex 7 for some further information on the types of micro-enterprises supported). Another change in target

was that we expected sales to be made through the support of a Manu Cooperative but in reality participants preferred to managed sales individually. Therefore for Indicator 3 we measured the income increase against baseline at the start of the project using the household survey. We found that the average income increase was 34.5% compared to our the target of a 20% increase. We believe Output 3 was achieved.

**Output 4: Increased knowledge of biodiversity conserved through rainforest regeneration and how high priority conservation species use regenerating rainforest, shared through scientific papers and environmental education to local and international audiences.**

90% or 40 of Manu's 44 highest conservation priority bird and mammals species were found using regenerating rainforest (Indicator 1 Target 80%), demonstrating the importance of the Manu Biosphere reserves buffer and transition zones for conservation. In total the project documented 1079 species in the area from 7 indicator groups (target 5 indicator groups) across 5 areas of the buffer zone (target 3 areas) so we have greatly increased knowledge of the biodiversity of the area and the efforts to demonstrate the importance of the area for biodiversity exceeded the application target by a considerable margin. The patterns of abundance across locations (including of 5 key mammal conservation species highlighted in the target for Indicator 3) are considered in the 2 biodiversity technical reports shown in Annex 7 and further shown by the data held in the projects GID biodiversity database and in annual reports. The 2017 report in Annex 7 explores one of the greatest conservation challenges identified during the project, a new road extension that is planned to bisect the buffer zone of the reserve but the project data also shows that the even the most endangered species (the black-faced spider monkey) is still in the area (in very small numbers) so that with the instigation of sustainable approaches in the area the buffer zone could retain its current conservation value long term. The project partners are actively applying for post-darwin funding to tackle this challenge. A wide range of environmental and biodiversity education activities were successfully undertaken, see Sustainable Manu Technical report in Annex 7 for further description, and reached 686 participants (original target 300). The project also produced 9 scientific papers to share our new knowledge of regenerating rainforest biodiversity and new ways of monitoring it (see publications in Annex 5 and links in logframe work), 6 environmental education/biodiversity identification guides were produced (Indicator 3 Target 3 see logframe and technical reports for details). We therefore consider Output 4 was exceeded.

**Output 5: Delivery of a practical, evidence-based, implementable strategy to Manu Biosphere Reserve community documenting the potential for rainforest biodiversity conservation through sustainable development linked to rainforest regeneration.**

The 4 project technical reports (Annex 7) provide the evidence base (Indicator 1) documenting the potential for rainforest biodiversity conservation through sustainable development linked to rainforest regeneration. Looking forward the most important report for delivering an improved future for biodiversity conservation around Manu is the new Environmental Education and Communication Strategy for Manu (including Financing Plan) (Indicator 1) which forms part of the official Manu National Park master management plan for 2018-2022. The results of the project were widely communicated (Indicator 2) to local communities (through workshops in Salvacion and MLC on 5/04/2018), conservation NGOs and government organisation (through presentations, individual, meetings and a half day conference meeting in Cusco on 5/07/2019). This resulted in the formation of a steering group involving Manu National Park management and the key conservation organisations working in Manu to guide and ensure future implementation of the new strategy and research and monitoring of the conservation of Manu's key biodiversity and habitats more widely. Key participants in implantation of the new strategy include the management team of Manu National Park, representatives of Crees, Frankfurt Zoological Society; San Diego Zoo Global; ACCA; the Education Management Units UGEL Manu and UGEL Paucartambo; the Regional Offices of Education of Cusco and Madre de Dios; and the Manu Provincial Municipality. The steering group has met monthly since completion of the Darwin funded project. We therefore feel Output 5 was achieved.

### 3.2 Outcome

The project intended outcome was to: Demonstrate to the conservation community how rainforest regeneration can deliver high-priority biodiversity conservation and enhanced livelihoods for communities currently dependent on unsustainable exploitation of rainforest habitat in Manu Biosphere Reserve.

By measuring the number and relative abundance of 7 indicator taxa and finding 40 bird and mammals species of highest conservation priority (Indicator 1 and Output 4) we have successfully demonstrated that rainforest regeneration can deliver important biodiversity conservation habitat. At the same time we supported the development of 19 types of sustainable micro-enterprise with 119 enterprise participants (Indicator 2 and Output 3) , 588 direct beneficiaries (participants and their supported families, Indicator 4 and Output 3) and demonstrated income increases of more than 30% from baseline (Indicator 2 and Output 3). These micro-enterprises provided full time occupations virtually eliminating the potential for participants to regularly travel to unsustainably exploit primary rainforest (Indicator 3 & Output 1). We also provided 686 participants with environmental education training (Output 4) and 265 with micro-enterprise training (Output 2). We developed and shared 4 technical reports on biodiversity, sustainable development and environmental education with the Manu conservation community and jointly with that community helped support the development of a new 4 year Master Plan for conservation management of Manu for the next 4 years (2018-2022) (Indicator 1 and Output 5). Perhaps most importantly we and the Manu conservation community identified one of the greatest threats to future biodiversity conservation in Manu to be the lack of knowledge of the importance, conservation value and sustainable development value of the buffer zones of the Manu Biosphere Reserve. If local communities and the Manu conservation community value and protect the national park's buffer zones for both their biodiversity value and their ability to support the sort of sustainable incomes and livelihoods that this project demonstrated then Manu National Park will have a sustainable long term future for protecting one of the world's most important rainforest areas. Without resilient buffer zones that provide local people with the possibility of sustainable livelihoods the park will face ever increasing threats from encroachment and unsustainable extraction of resources. To start to address this threat to biodiversity conservation the project led the writing of the first Environmental Education and Communication plan for Manu (Output 5) and delivery of this plan over the next 4 years has been incorporated into the Master Plan for Manu so that the project findings will be acted on jointly by the many organisations that make up the Manu conservation community. We thus consider that the project has been successful in achieving its planned outcome of demonstrating the importance of the regenerating rainforests of the buffer and transition zones of Manu Biosphere to the conservation community responsible for delivering biodiversity conservation in the globe's richest biodiversity hotspot.

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

The impact that this project is intending to help achieve is to "Determine the value of rainforest regeneration for catalysing biodiversity conservation and sustainable development in human-use zones of Manu Biosphere Reserve, so validating a widely applicable, collaborative solution to biodiversity loss."

With the extensive collection of new biodiversity inventory and monitoring data (more than 63,000 new biodiversity distribution records of 1079 species, Output 4) from across regenerating rainforest in human use zones of the Manu Biosphere Reserve, we have produced the evidence to demonstrate the high conservation value of the Manu buffer zones specifically and the potential biodiversity conservation value of regenerating rainforest more widely. Similarly, after supporting the development of 119 sustainable micro-enterprise initiatives (Outputs 1,2 &

3) we have been able, to assess and determine the value of approaches supporting rainforest regeneration for sustainable development in Manu and in rainforest areas more generally. Building on this information and working in collaboration with many partners in the conservation community we have helped deliver a new Environmental Education and Communication strategy for Manu National Park (Output 5) that will run for the next 4 years and is designed to change how the population of Manu (& Peru) think about the conservation and socio-economic value of regenerating rainforest areas and buffer zones, By changing the environmental and economic value associated with the buffer zones and by extension Manu NP itself, the long term goal of the new strategy is to catalyse greater protection of the buffer zones and their biodiversity as well as the growth of sensitive development using economically sustainable enterprises (involving biogardens, agroforestry etc), which also support increasing incomes and the recovery of biodiversity. Demonstrating and communicating the potential economic benefits of these regenerating areas provides a route to reducing pressure to further degrade pristine forest over the coming decade and the economic model of the sustainable enterprises is already being used in Manu by Peruvian governmental organisations (FONCODES & Agrobanco) in a drive poverty reduction by increasing the income of local households. We thus believe the project has contributed to and will continue to contribute to its intended impact.

## **4 Contribution to Darwin Initiative Programme Objectives**

### **4.1 Contribution to Global Goals for Sustainable Development (SDGs)**

This DEFRA funded Darwin project did not include a formal goal to contribute to SDGs at the application stage. However, the project contributed to SDG 2 by promoting sustainable agriculture and SDG 8 by promoting sustainable economic growth. This was represented by the support of 56 agricultural based sustainable micro-enterprises (24 agro-forestry and 32 biogardens) plus support for a further 63 micro-enterprise participants working on sustainable micro-enterprise alternatives (Output 3 Indicator 2) to the unsustainable extractive industries (logging, forest clearance, gold-mining etc) that normally dominate in rainforest areas. Together these enterprises supported 588 direct beneficiaries (the direct participants and their supported family members, Output 3, Indicator 1)

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

The evidence on the conservation and biodiversity value of regenerating rainforest collected by the project in Manu has and is being used to increase the understanding and perceived value of biodiversity and regenerating rainforest and its protection in the Manu Biosphere Reserve UNESCO World Heritage site, Peru (Convention on Biodiversity – CBD – Articles 1 & 8). A key demonstration of this has been the development by the project partners of the first Environmental Education and Communication Strategy for Manu National Park (MNP) and its Buffer Zone 2018 – 2022. This is the first time that a formal environmental education strategy has been developed in Manu and it includes not only the core national park but the much larger surrounding populations living in the buffer zones of the Manu Biosphere Reserve on which the Sustainable Manu project work focused. This strategy has been included as an annex to the updated Master Plan for Manu National Park 2018 – 2022 (the formal, legally binding management plan for the whole Manu area) , which officially commits the Peruvian government to its implementation for the next 4 years. The project provides an additional route for Amazonian biodiversity protection (CBD Articles 5 & 6) by demonstrating the economic benefit of using regenerating forest which, through the empowerment of the community and provision of long term support for sustainable livelihoods, also supports the CBD (Article 10). The enhancement of relevant educational resources, the creation of entrepreneurial micro-enterprise based on sustainability and the provision of enriched economic opportunities will incentivise conservation by those who rely on it directly (CBD Article 11). Additionally contributions to Aichi targets are listed in Annex 4.

### 4.3 Project support to poverty alleviation

Although, as an initially Defra funded programme, this project was focussed on sustainable use of ecosystems rather than directly on poverty alleviation, it assisted in reducing poverty through enhancement of the education system and provision of resources to develop economically sustainable biogarden and agroforestry enterprises (Outcome Indicator 2), which increased incomes of participants over the course of the project by 33% and 36% (Outcome Indicator 4). In addition, biogardens, which are typically run by women, provide income directly to families and empowerment for local women as well as providing a source of food. Based on a survey of beneficiaries and workshop discussion, participants rated health, having natural products and economic benefits as the main importance of having a biogarden. However the most common reason reported for having a biogarden was unexpectedly its emotional importance, with responses including, "It makes me happy," "It's a distraction," and "I'm glad," showing that biogardens are perceived to have a strong influence in participants' daily happiness (see Sustainable Manu Lessons Learned Report in Annex 7).

### 4.4 Gender equality

While the project was not targeted specifically on gender equity issues, the general culturally driven differentiation between biogardens being run by women and agroforestry plots by men, meant that the project was designed to ensure it had an impact across gender, promoting support to the family and poverty alleviation. Participation and leadership in sustainable microenterprise by woman can provide a route out of poverty and dependency and we therefore closely monitored participation rates to ensure woman as well as men were applying for and taking part in project training opportunities and leading microenterprise. Based on the project participation records, and in line with expectations due to traditional cultural gender roles and land ownership patterns, 76% of the biogarden microenterprise participants were women and 83% of agroforestry microenterprise participants were male by the end of the project. It has been pleasing that the project has managed to recruit male and female participants for both types of enterprise so that there can be future roles models for both genders. At the start of the project it was far from certain that this would be practical but with project staff making a positive effort to talk to and encourage potentially underrepresented groups we are at least able to demonstrate there are opportunities for both genders in either type of microenterprise and we expect this will have a positive gender equality impact over the longer term. In the other more general microenterprise development initiatives, where we were starting with less traditional gender differentiation of roles, 60% of recruited participants are female and 40% male so we are successfully reaching across gender and helping create opportunities that over the longer term should help reduce gender inequalities by creating routes to economic independence for both genders.

### 4.5 Programme indicators

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

In general no, the management structures already involve a local participation structure for the communities living within Manu National Park and this was not changed by the project.

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

Yes, the new Master Plan for Manu National Park 2018 – 2022 was developed by Manu National Park with the active participation of many other project partners.

- **Were these formally accepted?**

Yes this has been accepted as the governing plan for the management of Manu National Park and its surrounding buffer zone areas that make up the Manu Biosphere Reserve.



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

As mentioned above the management structure involves significant local consultation with the rural communities and this is participatory in nature with including the involvement of local women. After this implementation is largely top down in nature as it is delivered by park employees.

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

Yes

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

Anecdotally project staff report all participants incomes as increasing but frustratingly at the time of writing we have no formal analysis to confirm this as the analysis wasn't coded to record whether any HH incomes did not increase.

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

Based on like for like comparisons incomes increase 33% for biograden participants and 36% for agro-forestry participants between Years 1 & 3 of the project. Compared to a similar control group not involved in the micro-enterprise activities the participants incomes were 38.2% higher at the end of the project.

#### 4.6 Transfer of knowledge

The primary versions of the project databases, reports, evidence, data and training materials are held in Peru. The biodiversity technical reports were prepared for the conservation practitioners and managers of Manu National Park to provide a permanent record of the key biodiversity of the buffer zone areas inventoried along with results being communicated during the project in meetings, workshops and local, national and international conferences about the national park and the Manu area. Nine formal scientific papers covering new knowledge of Manu's biodiversity, biodiversity and conservation value of regenerating rainforest and new developments in biodiversity survey methods for regenerating rainforest have been written (8 have been published and the 9<sup>th</sup> is in review, see Annex 5) to share knowledge globally and nationally with the conservation and scientific communities in and beyond Peru. Two Peruvian biologists (1 female & 1 male) were supported to undertaking Masters degrees in the UK, both successfully graduating from the University of Glasgow, one in 2017 and one in 2018.

#### 4.7 Capacity building

The two primary Peruvian biodiversity survey fieldworkers, Ruthmery Pillco Huarcaya and Shirley Jennifer Serrano Rojas (both female) were promoted several times during the project to team and then leadership positions. At the end of the project they both went on to win opportunities to gain international scientific experience (a significant step in helping develop a scientific or conservation career in Peru). One winning a fully funded international Chevening Scholarships to undertake her masters degree in Glasgow and one being recruited to an international biodiversity research team in Costa Rica.

### 5 Sustainability and Legacy

The world's rainforests are vital for preserving global biodiversity and maintaining essential ecosystem and economic services. Yet a widespread perception exists that there is a fundamental conflict between the desire to conserve biodiversity in healthy rainforest ecosystems and the aspirations and needs of impoverished local peoples living in and around rainforests. The overall legacy that the Sustainable Manu project leaves is a robust evidence base that

demonstrates both that it is possible to deliver high-priority biodiversity conservation (Output 4 Indicators 1 & 3)) in combination with enhanced livelihoods for communities (Output 3 Indicator 1), and demonstration of practical ways microenterprise approaches to sustainable development can help achieve this in Manu (Output 3 Indicators 1 & 2). By working with local people we have already been able to demonstrate that there is widespread local interest in Manu in the sustainable microenterprise approach and to demonstrate how microenterprise support can be delivered in practise (Outputs 1 & 3) and these demonstrations have attracted national government interest in Peru. As discussed in the partnership section of this report, , the biogardens and agroforestry microenterprise approaches implemented have attracted the attention of two Peruvian government bodies (Agrobanco, the Peruvian state agriculture development bank and FONCODES, a national development programme of the Peruvian government's Ministry of Development) who are interested in supporting scaling up of the approaches the Sustainable Manu project has been able to demonstrate. The demonstration project approach that we are used the Darwin Initiative funding to implement has therefore reached national audiences in Peru and through delivering the key legacies outlined below will be able to do so long after the Darwin Initiative project funding ends.

The project has achieved 5 key legacies, described below

- 1) Legacy: A scientifically robust evidence base that establishes the importance of regenerating rainforest for conservation based on more than 63,000 new biodiversity records of 1079 species collected by Sustainable Manu's biodiversity survey programme. This database and the publications arising from it (Annex 5)) will enable informed conservation decision making on regeneration rainforest conservation for many years after the project ends.
- 2) Legacy: Inclusion of data from regenerating rainforest on the abundance of 5 key mammal conservation targets in the Manu National Park monitoring programme (Spider Monkey, Woolly Monkey, Jaguar, Tapir and Peccary). As this monitoring plan is a central management tool for determining and implementing conservation in Manu, addition of biodiversity data from regenerating rainforest allows these areas to be considered in Manu's conservation planning. With data collected using Sustainable Manu's ground breaking combined arboreal and terrestrial camera trapping approaches (Annex 5 Publication 4) we have been able to collect data on of these key conservation species and we have been able to analyse the factors that predict the distribution of these and other arboreal and terrestrial mammal species in disturbed forest (Annex 5 Publications 2, 8 & 9), a key requirement for their effective conservation.
- 3) Legacy: Development of 119 micro-enterprise initiatives based on agro-forestry, biogardens and other sustainable uses of existing cleared land, or new skills so demonstrating sustainable alternatives to the current unsustainable pressure on primary forest that threatens Manu's biodiversity.
- 4) Legacy: Creation of environmental education and microenterprise skills training approaches (e.g. The Business of Guiding presentations see Section 6.2) and 6 biodiversity/environmental education training resources (see Section 6.2 and Annex 7 Sustainable Manu Lessons Learned Report for links to resources) that will have continuing benefit local people long past the end of the project.
- 5) Legacy: Creation of a strategy for scaling up environmental education and conservation communication based on integrated sustainable development and biodiversity conservation so that it can be applied across Manu to allow the benefits demonstrated by the legacies above to be multiplied and delivered throughout across 915 km<sup>2</sup> of the Manu Biosphere Reserve buffer zones.

The main Peruvian project partners Crees and Manu National Park along with many other stakeholder organisations continue to work in Manu using these legacies on a day to day basis.

## 6 Lessons learned

Most of the more specific lessons and responses are outlined in other sections of this report, in particular in section 3. At a more general level the biggest lesson learned has been about the importance of strong in country local partners with staff permanently based in the project area. Having these strengths allowed the project to continue to be delivered during the project leader's prolonged illness (see below). With the project leader ill and very restricted in activity for 2 years it would have been impossible for the project to be continued if the original project ideas and application had not been developed and designed with the in-country partners. Increased use of digital technologies, rather than relying on paper based data collection for project monitoring, was also a significant factor in enabling communication when the project leader couldn't be in country.

The project leader's illness (complications from a parasitic infection picked up in Manu during the first year of the project) made project management considerably more difficult than envisaged. It was dealt with by handing over most of the day to day management tasks to staff in Peru, while the project leader has focused on providing scientific expertise and support for the design and delivery of project activities via skype. It had been envisaged in the original project planning that there would be a gradual handing over of management responsibility from the UK partner to Crees, the main Peruvian delivery partner, with the project leader moving in to a mentoring and support role to promote capacity building in Peru. The actual handing over was much more abrupt and less planned than would have been desirable but ultimately it was successful to the extent that the project leader's illness did not prevent achieving the project output or outcome. The parts of the project that were most impacted were the project reporting and the project leader's inability to visit Manu. Writing all the reports including this one was very delayed for which we apologise and thank the staff who manage the Darwin Initiative for their support during what was a very difficult period.

### 6.1 Monitoring and evaluation

Monitoring of the biodiversity outcomes and outputs (Outcome Indicator 1) was carried out through the project GIS database containing all biodiversity distribution and abundance data collected during the project. The results of the individual monitoring surveys were entered into the database after collection and the Biodiversity Field Team Leader and the Biodiversity Monitoring Coordinator, then used the database to produce monthly reports on the biodiversity recorded by the project. As part of the monitoring and evaluation process two technical reports on the biodiversity of regenerating rainforest in Manu were produced in year 2 and year 3 that along with the project GIS database (held in Cusco by Crees) demonstrate the important environmental and conservation role that regenerating areas can play around Manu with 1079 identified species recorded across the 7 indicator groups studied (see Tree Top Manu Biodiversity Technical Reports in Annex 7).

The key means of monitoring the micro-enterprise results (Outcome Indicators 2, 3 & 4) was through the use of household and questionnaire surveys of the participants being supported by the project. In the first year the household surveys had provided an interesting learning curve for the project about local concerns that data might in some way be seen by the authorities. This was overcome in the first year and the project developed a household survey design that was acceptable to the participants. A useful result from the ongoing monitoring was that average family size of participants was slightly lower than the 5 family members assumed at the start of the project. Identifying this early allowed us to increase the number of participants supported to 119 to help the project exceed its goal of reaching 550 direct beneficiaries (defined as micro-enterprise participants and their family members). Over the course of the project we increasingly moving to digital rather than paper means of recording the monitoring information as this provided quicker access and evaluation of the monitoring data.

The formal household surveys were supplemented by visual inspection of agroforestry plots, biogardens, etc. by project staff and participants. These informal inspections occurred several times a year, with frequency depending on individual need for support and stage within the project. Assessment of progress towards indicators was therefore designed not just to be

assessed by project staff but to be an activity that participants perform to help maximise their income gains and learning and to allow them (and the project) to adapt as lessons were learned or difficulties identified.

## 6.2 Actions taken in response to annual report reviews

The annual report feedback below was received and discussed with partners and has been responded to in the following ways:

As review of the year 2 reported noted the wording changes proposed in that annual report were to clarify indicators rather than representing changes to what the project intended to achieve. These were discussed with the Darwin and as none changed the Output or Outcomes it was decided that no change requests were needed. The wording changes included are highlighted in the logframe in the appendix.

Most training courses were practical based courses involving the acquisition of specific agricultural skills using demonstration bio-gardens and agroforestry plots to help participants improve crop management, yields etc and were often being taught to audiences that at least partially would have difficulty with written materials. Most courses therefore weren't based on written materials. An exception was the biodiversity field guides and identification plates produced for eco-tourism guides and used as environmental education tools, two examples of these can be downloaded here <https://crees-manu.org/field-guide-for-amphibians-in-manu/> and here <https://zenodo.org/record/1186815#.XJpJwVX7SM9> for the orchid bee guide. We could also provide a copy of our The Business of Guiding presentations as another example of training materials, the file size for the materials is 425 MB so is too large to add here but could be shared on request.

The market analysis for scaling up will be important but it isn't something we as a project have the resources to do and the scaling up will be carried out as a follow-on from this project in conjunction with the new Peruvian partner organisations, FONCODES & Agrobanco.

This year we have reported against indicators and targets within section 3 and elsewhere in this report.

No.	Comment	Discuss with Darwin	Next half year report	Final Report	No response needed
1	Please submit a change request for your suggested logframe changes in order to formalise these	X			
2	Include further evidence of your training courses in particular including sample materials			X	
3	Ensure you comment on whether market analyses have been carried out for the micro-enterprises. If this is not appropriate for the context in which you are working, please provide further information.			X	
4	Clearly and consistently report against your indicators in your logframe			X	

## 7 Darwin identity

The Darwin Initiative is recognised and publicized as the key funder of the Sustainable Manu work on the Crees Manu Foundation website (<https://www.crees-manu.org/manu-national-park-threats-rainforest-reborn-saving-biodiverse-place-earth>) and the Darwin Initiative logo and name are used on all the key reports, educational resources and other materials produced. Examples of how the Darwin Initiative logo and identity are publicised can be seen in the Tree Top Manu Technical report on Manu's regeneration rainforest biodiversity in the appendices of this report and in the Amphibians of the Manu Learning Centre educational guide (<https://view.joomag.com/field-guide-amphibians-of-manu-field-guide-amphibians-of-manu/0570162001483967388?short> e.g. pages 281, 280 & 6) There is no specific project website (though it is referenced at: [http://www.gla.ac.uk/researchinstitutes/bahcm/internationalisation/southamerica/research/ecology/headline\\_412857\\_en.html](http://www.gla.ac.uk/researchinstitutes/bahcm/internationalisation/southamerica/research/ecology/headline_412857_en.html)) . Both Crees Manu and UG have twitter feeds that cover project results, but these are not specifically related to the project. The various blogs and videos from the project used to publicise specific project findings on Manu's biodiversity and the other project work also publicise the Darwin Initiative name/logo (for specific examples see <https://www.naturettl.com/camera-traps-rainforest-canopy-capture-incredible-wildlife/>, <https://www.youtube.com/watch?v=BibobZMTmIU>).

## 8 Finance and administration

### 8.1 Project expenditure

Project spend (indicative) since last annual report	2017/18 Grant (£)	2017/18 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)			43%	All the variances in the table were linked to the project leader's illness and associated increases in in-kind & matched funding allocated to operating and travel costs meant more Darwin funds allocated to salary costs
Consultancy costs				
Overhead Costs			-9%	
Travel and subsistence			-57%	
Operating Costs			-84%	
Capital items (see below)				
Others (see below)			-41%	
<b>TOTAL</b>			<b>-2%</b>	Despite the variances above overall Darwin Grant expenditure

				remained as projected with the slight underspend due to the project leader not being able to travel
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<b>Staff employed (Name and position)</b>	<b>Cost (£)</b>
Ross MacLeod Project Leader	
Partner Salary Costs	
<b>TOTAL</b>	

<b>Capital items – description</b>	<b>Capital items – cost (£)</b>
<b>TOTAL</b>	

<b>Other items – description</b>	<b>Other items – cost (£)</b>
Consumables	
<b>TOTAL</b>	

## 8.2 Additional funds or in-kind contributions secured

In addition to the cash funding below University of Glasgow staff and students made in-kind contributions of time spent on project valued at £30,000.

<b>Source of funding for project lifetime</b>	<b>Total (£)</b>
TJMF Foundation Grants	
Crees Manu Internal Funding	
University of Glasgow	
National Geographic Grant	
<b>TOTAL</b>	

<b>Source of funding for additional work after project lifetime</b>	<b>Total (£)</b>

<b>TOTAL</b>	

### 8.3 Value for Money

Darwin Initiative funding of £283,335 was matched by funding of £393,158 from other sources suggesting that in purely financial terms that the Darwin Initiative grant was a successful catalyst that provided good value for money. The funding helped create 119 microenterprise initiatives that demonstrated that sustainable development is an option for Manu, one of the most biodiverse ecosystems on the planet and in rainforests globally. The funding also enabled one of the most extensive biological inventories of regenerating rainforest habitat contributing more than 63,000 records of 1079 species and helping establish the buffer and transition zone of the Manu Biosphere as a globally important site for biodiversity conservation. Additionally the funding supported environmental education training for 686 people. Along with the many other outputs outlined in this report these suggests the project was good 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><b>Impact:</b></p> <p>Determine the value of rainforest regeneration for catalysing biodiversity conservation and sustainable development in human-use zones of Manu Biosphere Reserve, so validating a widely applicable, collaborative solution to biodiversity loss.</p>			
<p><b>Outcome:</b></p> <p>Demonstrate to the conservation community how rainforest regeneration can deliver high-priority biodiversity conservation and enhanced livelihoods for communities currently dependent on unsustainable exploitation of rainforest habitat in Manu Biosphere Reserve.</p>	<ol style="list-style-type: none"> <li>1. The number and relative abundance of species of high biodiversity conservation priority, and the species richness of other indicator biodiversity, using and relying on regenerating rainforest.</li> <li>2. The type and number of rainforest regeneration and sustainable micro-enterprise initiatives successfully initiated by participants trained during the project.</li> <li>3. The proportion of time participants spend involved in new sustainable micro-enterprise activities, compared to time spent exploiting surrounding primary rainforest habitat.</li> <li>4. The number of people directly benefiting from each micro-enterprise initiative and the amount by which income changes for each participant.</li> </ol>	<p>Project GIS database containing all biodiversity distribution and abundance data collected during project, annual project reports, published papers on biodiversity.</p> <p>Annual household surveys of participants who receive training and support in developing micro-enterprise initiatives. Accounts of local co-operatives selling produce.</p> <p>Annual household surveys of participants. Team leader reports (including photographic evidence) on condition and outputs of agro-forestry plots and biogardens etc will provide independent verification of how much time is being spent on these activities (we know from pilot studies approximately how much time is necessary to keep plots etc well maintain and how much effort is required to produce specific outputs from micro-enterprises).</p> <p>Annual household questionnaire surveys, project training records and</p>	<p>Local community and conservation managers remain receptive to micro-enterprise approaches, to combining conservation and sustainable development goals and to project staff.</p> <p>Natural disasters don't impede access to the project area for lengthy periods (many weeks).</p> <p>Major national or international political instability doesn't cut transport links.</p>



		accounts of local co-operatives selling produce.	
<p><b>Output 1.</b></p> <p>Quantification of the potential for micro-enterprise to reduce unsustainable use, or exploitation of primary rainforest forest habitat.</p>	<p>1. The proportion of working time participants spend on sustainable activities and micro-enterprise initiatives</p> <p><i>By year 3, we expect involvement in micro-enterprises will take &gt; 50% of beneficiaries time for half of those involved and &gt;20% of time for the remaining beneficiaries.</i></p> <p>2. The proportion of working time participants spend away from their own land for activities linked to unsustainable exploitation or primary rainforest.</p>	<p>Annual household surveys of participants. Team leader reports (including photographic evidence) on condition and outputs of agroforestry plots and biogardens etc will provide independent verification of how much time is being spent on these activities as we know from pilot studies approximately how much time is kept plots etc well maintain and how much effort is required to produce specific outputs from micro-enterprises.</p>	<p>The following Output level assumptions apply to varying degrees to the 5 outputs and for convenience are listed once here rather than being repeated against each output.</p> <p>The majority of local participants involved in micro-enterprise activities remain engaged with activities. Project staff will have regular contact with participants throughout the project so can monitor for any evidence of reducing engagement and so offer support to help participants through difficulties.</p> <p>Biodiversity survey sites remain accessible during the project and are not inaccessible because of local political difficulties. Accessibility of sites can be easily monitored and project staff will keep in regular contact with local communities.</p> <p>Technical Institute management does not change and remains engaged with development of curriculum. The project is supported by the Peruvian Ministry of Education as well as within the institute so abrupt changes don't currently seem likely.</p>
<p><b>Output 2.</b></p> <p>Increased knowledge within the community of sustainable practices, natural land management, entrepreneurial skills, eco-tourism and local genetic resources.</p>	<p>1. The number of students enrolled on natural land management, eco-tourism, entrepreneurial and environmental awareness courses.</p> <p><i>By year 3, 60 full time students enrolled in local technical institute courses supported by project and</i></p>	<p>Annual household surveys of participants who receive training and support in developing micro-enterprise initiatives. Accounts of local co-operatives selling produce</p>	

	<p><i>participating in entrepreneurial and environmental awareness courses.</i></p> <p>2. The knowledge of local participants of sustainable practices, natural land management, entrepreneurial skills, eco-tourism and local genetic resources.</p> <p><i>Annual retention of sustainable practices, entrepreneurial skills etc based on annual house hold knowledge surveys of participants and based on regular assessments of skills and knowledge being utilised by participants in their micro-enterprise initiatives.</i></p> <p>3. Creation of micro-enterprise initiatives using knowledge and skills delivered by project training initiatives.</p>	<p>Annual household questionnaire surveys, project training records and accounts of local co-operatives selling produce</p>	
<p><b>Output 3.</b></p> <p>Increased participation in sustainable micro-enterprises and associated increased incomes within the local community.</p>	<p>1. The number of people benefitting from the micro-enterprise initiatives.</p> <p><i>550 people directly benefitting from micro-enterprise initiatives, including 250 from agroforestry initiatives and a further 300 people trained in or working on micro-enterprise initiatives by the end of 3 years.</i></p> <p>2. The number of agroforestry plots, biogardens and micro-enterprises.</p> <p><i>By end of project 50 agroforestry enterprises carried out by local men, 30 biogarden enterprises run by</i></p>	<p>Annual household surveys of participants. Team leader reports (including photographic evidence) on condition and outputs of agroforestry plots and biogardens etc will provide independent verification of how much time is being spent on these activities as we know from pilot studies approximately how much time is keep plots etc well maintain and how much effort is required to produce specific outputs from micro-enterprises.</p> <p>Annual household surveys of participants who receive training and</p>	

	<p><i>local women, 15 eco-tourism guide enterprises, and 15 enterprises generating income from the 3 further micro-enterprise initiatives which the local communities choose to receive training in during the year 1 of the project.</i></p> <p>3. Income generated through sales of produce etc through the local Manu Cooperative that the project helps set up.</p> <p><i>By year 3, sales through cooperative from the projects 6 types of micro-enterprise initiative to represent at least 20% of baseline income measured before participants receive training.</i></p>	<p>support in developing micro-enterprise initiatives. Accounts of local co-operatives selling produce</p> <p>Annual household questionnaire surveys, project training records and accounts of local co-operatives selling produce</p>	
<p><b>Output 4.</b></p> <p>Increased knowledge of biodiversity conserved through rainforest regeneration and how high priority conservation species use regenerating rainforest, shared through scientific papers and environmental education to local and international audiences.</p>	<p>1. The number of high conservation priority species and amount of biodiversity found in regenerating rainforest.</p> <p><i>By 2.5 years, 80% of Manu's 44 high conservation priority bird and mammal detected using regenerating rainforest and the relative abundance of each in the 3 project focal areas documented. Document the species richness of 3 further indicator taxonomic groups (amphibians, reptiles and butterflies) in regenerating forest.</i></p> <p>2. The number of participants involved in environmental and biodiversity education courses and activities and the knowledge they display afterwards.</p> <p><i>By end of year 3, 300 participants involved in project biodiversity and</i></p>	<p>Project GIS database containing all biodiversity distribution and abundance data collected during project, annual project reports, published papers on biodiversity.</p>	

	<p><i>environmental workshops and educational activities, with knowledge gains monitored by questionnaires.</i></p> <p>3. The number of submitted and published papers, reports and other educational resources produced as a result of biodiversity monitoring.</p> <p><i>5 papers submitted (and 3 accepted) by peer reviewed scientific journals before end of project. Annual reports to Manu National Park managers documenting the abundance of the 5 key mammal conservation targets in the Manu NP monitoring plan (Spider Monkey, Woolly Monkey, Jaguar, Tapir and Peccary) in regenerating rainforest forest. Three educational resources covering identification of Manu's key biodiversity.</i></p>		
<p><b>Output 5.</b></p> <p>Delivery of a practical, evidence-based, implementable strategy to Manu Biosphere Reserve community documenting the potential for rainforest biodiversity conservation through sustainable development linked to rainforest regeneration.</p>	<p>1. Completion and submission to conservation decision makers in Manu and Peru of a written strategy for integrated biodiversity and sustainable development around the Manu Biosphere Reserve</p> <p><i>A written technical report that; 1) Records, captures and assesses the evidence collected by the Sustainable Manu demonstration project on the potential for rainforest biodiversity conservation through sustainable development linked to rainforest regeneration and 2) Presents a costed strategy for catalysing biodiversity conservation through rainforest regeneration and sustainable micro-enterprise across the human-use zones of Manu</i></p>	<p>Project GIS database containing all biodiversity distribution and abundance data collected during project, annual project reports, published papers on biodiversity.</p>	

	<p><i>Biosphere Reserve so that large scale funding can be sought for its implementation.</i></p> <p>2. Presentation of project results to conservation managers and decision makers</p>		
	<p><i>In the final 3 months of the project staff present the project results at workshops with a) Manu National Park staff, b) local communities, c) conservation NGOs working in Manu and d) government departments.</i></p>		

**Activities**

Activity 1.1 Recruitment of participants for agroforestry and other micro-enterprise initiatives

Activity 1.2 Measure initial unsustainable use of primary forest by local participants and ongoing levels of sustainable and unsustainable activities

Activity 1.3 Measurement involvement with, income and welfare benefits of microenterprises

Activity 2.1 Delivery of Natural Land Management course

Activity 2.2 Development of Entrepreneurial Module

Activity 2.3 Deliver training workshops supported by expert partners

Activity 3.1 Training initiatives and workshops on micro-enterprises

Activity 3.2 Provide technical support and materials for creation of micro-enterprises

Activity 3.3 Develop micro-finance support system for micro-enterprises

Activity 3.4 Setup community co-operative to support agroforestry and biogarden businesses

Activity 4.1 Survey and data collection on regenerating rainforest biodiversity

Activity 4.2 Development of environmental education materials on biodiversity and its value in the Manu area

Activity 4.3 Biodiversity value and environmental education awareness workshops for local community and conservation managers in Manu

Activity 4.4 Talks, presentations and scientific communication of biodiversity results to local, national and international audiences

Activity 4.5 Writing of reports and scientific papers on the value of regenerating rainforest biodiversity

Activity 5.1 Collate the evidence on the conservation, sustainable development and educational gains made during the project

Activity 5.2 Write a strategy document for the Manu area outlining how rainforest regeneration and sustainable development could be used to impact biodiversity conservation

Activity 5.3 Present strategy to the Manu conservation community, Peruvian government and future funders

Activity 5.4 Finish!

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

There were no changes to project Outcome or Outputs. A few minor changes to wording in the Logical Framework were considered by Darwin staff not to be significant enough to require a project change request, these minor changes to text have been highlighted below using track changes and are discussed in section 3 of the report.

Project summary	Measurable Indicators	Progress and Achievements
<p><b>Impact</b></p> <p><b>Determine the value of rainforest regeneration for catalysing biodiversity conservation and sustainable development in human-use zones of Manu Biosphere Reserve, so validating a widely applicable, collaborative solution to biodiversity loss.</b></p>		<p>The Sustainable Manu project successfully collected the data (more than 63,000 biodiversity distribution records of 1079 species) to document systematically for the first the high biodiversity conservation value of the regenerating rainforests of the Manu Biosphere Reserve buffer and transition zones. The project also successfully supported the development of 119 sustainable micro-enterprise initiatives to demonstrate that increasing household and local community incomes in Manu is both possible and need not rely on the expansion of destructive extractive industries that damage the globally important. Based on these finding the project in partnership with many Manu conservation and education organisations has helped develop the first Environmental Education and Communication Strategy for Manu with the aim of improving knowledge and biodiversity conservation in Manu, this strategy has been incorporated in the Manu Master Plan that will direct management and conservation of the national park over the next 4 years (2018 – 2022). As such the project has achieved the impact it sought of demonstrating the value of rainforest regeneration and enhanced livelihoods and using this to catalyse acceptance of a new approach to valuing and communicating the importance of the human use zones of Manu Biosphere Reserve for long term conservation of Manu’s biodiversity. In doing so we have demonstrated and approach that could be used in many sensitive areas facing biodiversity loss.</p>
<p><b>Outcome</b> Demonstrate to the conservation community how rainforest regeneration can deliver high-priority biodiversity conservation and enhanced livelihoods for communities currently dependent on</p>	<p>1. The number and relative abundance of species of high biodiversity conservation priority, and the species richness of other indicator biodiversity, using and relying on regenerating rainforest.</p>	<p>1. Biodiversity monitoring surveys are ahead of schedule and moving towards completion, with the 44 high conservation priority species in the Manu area and 7 indicator taxa (birds, mammals, amphibians, reptiles and butterflies, dung beetles and orchid bees) being monitored across 5 areas of the Manu Biosphere Reserve.. More than 63,000 records of 1078 species were collected.</p>

<p>unsustainable exploitation of rainforest habitat in Manu Biosphere Reserve.</p>	<p>2. The type and number of rainforest regeneration and sustainable micro-enterprise initiatives successfully initiated by participants trained during the project.</p> <p>3. The proportion of time participants spend involved in new sustainable micro-enterprise activities, compared to time spent exploiting surrounding primary rainforest habitat.</p> <p>4. The number of people directly benefiting from each micro-enterprise initiative and the amount by which income changes for each participant.</p>	<p>2. 119 sustainable micro-enterprise initiatives were developed and supported by participants during the project and used to demonstrate how livelihoods can be enhanced in regenerating rainforest areas, this exceeded the planned total of 110. Agroforestry, biogradens, ecotourism guiding and sales of local artisanal products were the most frequent types of enterprises set up by participants but in total 19 different forms of micro-enterprises were supported, far exceeding the initial goal of demonstrating the potential for 6 types of sustainable micro-enterprise</p> <p>3. The household survey that will be used to document the extent of involvement in the micro-enterprises and their impacts has been successfully implemented and is ongoing. Participants involved in micro-enterprises spent on average between 34 and 49 hours per week working on sustainable activities and this represented full time work leaving little additional working time for exploitation of primary rainforest habitat.</p> <p>4. The sustainable micro-enterprise initiatives outlined above supported 588 direct beneficiaries, including 307 beneficiaries supported by biogradens and agroforestry enterprises, 177 tourism guides &amp; supported family members, 162 microenterprise support participants and their families. This exceeded the planned total in the original application of 550 direct beneficiaries of micro-enterprise activities. For beneficiaries involved in multiple years of project support, the agroforestry and biogardens micro-enterprises, monthly incomes increased by 36% and 33% respectively.</p>
<p><b>Output 1.</b></p> <p>Quantification of the potential for micro-enterprise to reduce unsustainable use, or exploitation of primary rainforest forest habitat.</p>	<p>1. The proportion of working time participants spend on sustainable activities and micro-enterprise initiatives</p> <p>2. The proportion of working time participants <u>have available to</u> spend away from their own land for activities linked to</p>	<p>Our household surveys showed that participants worked full time on their micro-enterprise activities with those involved in agricultural micro-enterprise (agro-forestry and biogardens) working on average 38 hours per week and those involved in other micro-enterprises working 49 hours per week.</p> <p>Due to sensitivity about answering questions on involvement in potentially illegal, unsustainable exploitation activities we were not able quantify involvement directly. We therefor focused on quantifying time available for other (less sustainable) activities and</p>



	unsustainable exploitation or primary rainforest.	found that on average participants had 7.3 hours per week available for other activities and this had dropped by 16% over the course of involvement with their micro-enterprise initiatives. The results suggest the micro-enterprise activities provided a full time occupation leaving relatively little opportunity for unsustainable exploitation of primary rainforest by participants involved in micro-enterprise activities.
Activity 1.1 Recruitment of participants for agroforestry and other micro-enterprise initiatives		119 micro-enterprise participants were successfully recruited over the course of the project. These included 24 agroforestry; 32 biogarden, 26 eco-tourism guide and 37 general micro-enterprise support participants.
Activity 1.2 Measure initial unsustainable use of primary forest by local participants and ongoing levels of sustainable and unsustainable activities		As identified in the first year report, directly measuring involvement in unsustainable exploitation of primary rainforest was not possible therefore house hold surveys focused on identifying the time participants had to potentially participate in unsustainable activities, which provided a conservative proxy for unsustainable exploitation activity.
Activity 1.3 Measure involvement with, income and welfare benefits of microenterprises		Household and participant questionnaire survey data collection were carried out throughout project.
<b>Output 2.</b> Increased knowledge within the community of sustainable practices, natural land management, entrepreneurial skills, eco-tourism and local genetic resources.	1. The number of students <del>enrolled</del> <del>on attending</del> natural land management, eco-tourism, entrepreneurial and environmental awareness <del>coursestraining</del> . 2. The knowledge of local participants of sustainable practices, natural land management, entrepreneurial skills, eco-tourism and local genetic resources. 3. Creation of micro-enterprise initiatives using knowledge and skills delivered by project training initiatives.	1. As indicated in this report the local land management course closed for local political reasons and this indicator for output 2 was replaced by numbers attending business development and environmental awareness training delivered via workshops. This training reached 265 members of the community, the original target had been 60 participants. 2. 56 participants used their increased knowledge and skills in sustainable and natural land management to develop sustainable agriculture based micro-enterprises. 26 participants used their expanded knowledge to work as eco-tourism guides, 3 participants used local genetic resource knowledge in combination with micro-enterprise training to develop enterprises based on selling endemic forest food crops to ecotourism lodges and 37 participants used training in entrepreneurial skills to develop other general micro-enterprises.

		3. 119 micro-enterprise initiatives developed using knowledge and skills delivered by project micro-enterprise training
Activity 2.1 Delivery of Natural Land Management <del>course</del> training		As described above, developed and delivered a series of micro-enterprise support, land management and environmental education workshops to replace activity that would have taken place within Land Management course.  Developed relationships with other local educational institutes to allow delivery of workshops.
Activity 2.2 Development of Entrepreneurial Module		Development and delivery of two entrepreneurial business development training workshops, which was held in Dec 2016 and May 2017.
Activity 2.3 Deliver training workshops supported by expert partners		Delivered biograden cultivation, composting, dealing with insect pests, crop rotation workshops for 140 participants and micro-enterprise development workshops for 125 participants.
<b>Output 3.</b>  Increased participation in sustainable micro-enterprises and associated increased incomes within the local community.	<p>1. The number of people benefitting from the micro-enterprise initiatives.</p> <p>2. The number of agroforestry plots, biogardens and micro-enterprises.</p>	<p>1 588 direct beneficiaries, including 177 tourism guides &amp; supported family members, 307 beneficiaries supported by biogradens and agroforestry enterprises, 162 microenterprise support participants and their families. 265 people were provided with micro-enterprise training and a further 111 partners worked in micro-enterprises with the supported participants.</p> <p>2. 24 agroforestry, 32 biogarden, 26 eco-tourism guide and 37 general micro-enterprise support participants. Reflecting local demand during initial community consultations larger agro-forestry plots that could support participants full time were supported. This resulted in fewer agro-forestry participants than originally planned, this was more than offset by increased number of eco-tourism and general micro-enterprise participants supported.</p> <p>3. Income was generated directly through sales by individual micro-enterprise participates (and is reflecting in the income increases of 36% &amp; 33% mentioned in Outcome 4 above) rather than by participants combining to sell through a formal cooperative arrangement.</p>

	3. Income generated through sales of produce etc through the local Manu Cooperative that the project helps set up.	Various community level and industry specific cooperative projects were developed including for example the gathering together of 26 eco-tourism participants with industry experts to assess barriers to developing Manu ecotourism opportunities further.
Activity 3.1 Training initiatives and workshops on micro-enterprises		<p>Delivered 16 training workshops to 265 participants, covering a wide variety of skills and knowledge needed for the participate in the development of the different micro-enterprises. Held an additional specialist agroforestry workshop for 40 participants.</p> <p>NB. These workshops are the same workshops mentioned under activity 2.3, the workshops were designed to contribute to both Outputs 2 &amp; 3 by including both specific training to increase participation/incomes and more general training to increase community knowledge of sustainable practices, natural land management, entrepreneurial skills etc.</p>
Activity 3.2 Provide technical support and materials for creation of micro-enterprises		<p>Provided one-on-one technical support to 24 agroforestry entrepreneurs.</p> <p>Provided one-on-one technical support to 32 biogarden entrepreneurs.</p> <p>Provided general start up and business development micro-enterprise support to 26 eco-tourism guide and 37 general micro-enterprise support participants via business planning and skills workshops.</p> <p>The creation of the 56 agriculture based micro-enterprises were supported with start up materials including tools, seedlings and materials</p>
Activity 3.3 Develop micro-finance support system for micro-enterprises		During the project the Peruvian state agriculture development bank (Agrobanco) started a microfinance service in the Manu Biosphere Reserve area. The project provided expertise and experience developed in Manu to support the role out and successful implementation of this service across Manu and help the micro-enterprises developed during the project access this support.
Activity 3.4 Setup community co-operative to support agroforestry and biogarden businesses		The project setup regular community meetings and discussions to support a co-operative platform for exploring barriers and solutions to selling products (especially from biogardens and agroforestry etc) and providing microenterprise services in Manu. Key activities

		included community co-operative workshops on micro-enterprise in agriculture, ecotourism and business development.
<p><b>Output 4.</b></p> <p>Increased knowledge of biodiversity conserved through rainforest regeneration and how high priority conservation species use regenerating rainforest, shared through scientific papers and environmental education to local and international audiences.</p>	<p>1. The number of high conservation priority species and amount of biodiversity found in regenerating rainforest.</p> <p>2. The number of participants involved in environmental and biodiversity education courses and activities and the knowledge they display afterwards.</p> <p>3. The number of submitted and published papers, reports and other educational resources produced as a result of biodiversity monitoring.</p>	<p>1. In the regenerating rainforest of the buffer zone the biodiversity monitoring surveys recorded 40 (90%) out of the potential 44 high conservation priority bird and mammal species known in the Manu area. Additionally, 1078 species of 7 indicator taxa (birds, mammals, amphibians, reptiles and butterflies, dung beetles and orchid bees) were identified in 5 areas of the Manu Biosphere Reserve buffer zones and a rapid assessment survey of 50 locations from Salvación to Shintuya to examine potential biodiversity impacts of the newly expanding Manu road that is being extended through the buffer zone. This represented an additional output of 2 extra regenerating rainforest areas to those originally planned. Dung beetles and orchid bee monitoring represented additional outputs to the original application and were chosen for their ability to indicate ecosystem services and health of rainforest environments.</p> <p>2. A wide range of environmental and biodiversity education activities were successfully undertaken with 686 participants (original target 300).</p> <p>3. A total of 6 papers covering new knowledge of Manu’s biodiversity, biodiversity and conservation value of regenerating rainforest and new developments in biodiversity survey methods for regenerating rainforest have been submitted and published. Two species identification guides for Manu’s biodiversity (on amphibian and orchid bees) ad 3 sets of biodiversity identification plates (on reptiles, amphboans and woolly monkey food plants) were published to support eco-tourism guiding and biodiversity monitoring. Two technical reports on the biodiversity of the Manu Biosphere’s regenerating rainforest biodiversity were completed for the national park.</p>
Activity 4.1 Survey and data collection on regenerating rainforest biodiversity		Over three years, our biodiversity monitoring surveys produced more than 63,000 records of 1,078 species, highlights included, 380 species of bird and 63 species of larger mammals

	<p>from 33,162 records, 70 species of amphibians and 49 species of reptile from 4,133 records, 516 butterfly species from 26,078 individual records.</p>
<p>Activity 4.2 Development of environmental education materials on biodiversity and its value in the Manu area</p>	<p>Bilingual field guide to “Amphibians of the Manu Learning Centre and other areas in the Manu Region” and information guide to Orchid Bees published along with biodiversity guides (on amphibians, reptiles and orchid bees). The materials were used as environmental education teaching aids and to enable ecotourism guides to introduce lesser known aspects of Manu’s incredible biodiversity to their clients along with one children’s environmental educational book to support school education across Manu.</p>
<p>Activity 4.3 Biodiversity value and environmental education awareness workshops for local community and conservation managers in Manu</p>	<p>Delivered environmental education workshops and activities 686 participants</p> <p>The Real Forest Experience workshop program developed in Year 1 aimed at teaching local students about the value of biodiversity and sustainable development based on experiences while in the rainforest. A total of 96 primary and secondary school children participated over the course of the project.</p> <p>Delivered 4 environmental education classes at the IEBR Jose Carlos Mariategui Collegio in Salvacion - 120 students.</p> <p>Participated in the Annual Banana Fair (local agricultural show) in Salvacion, with two stalls on the 2nd and 3rd of September 2017. Delivered displays on the importance of biodiversity and conducted a public taste test to demonstrate the quality and value of organically grown produce with ~60 local participants.</p>
<p>Activity 4.4 Talks, presentations and scientific communication of biodiversity results to local, national and international audiences</p>	<p>Delivered talks and presentations, to audiences totalling 418, summarising Sustainable Manu’s results and how they serve as a basis for biodiversity conservation, environmental interpretation and education throughout Peru.</p> <p>Presented project research results directly to over 80 international tourists visiting our base at the Manu Learning Centre.</p>

	<p>Produced 6 blogs (video or written word) on biodiversity research activities at the MLC that includes reptiles, woolly monkeys and Tree Top Manu biodiversity surveys (see Table 2 Publications).</p> <p>Delivered research results to 3 visiting international school/University groups: Deakin University, Reaseheath College and Carolina School.</p>				
<p>Activity 4.5 Writing of reports and scientific papers on the value of regenerating rainforest biodiversity</p>	<p>9 papers covering new knowledge of Manu’s biodiversity, biodiversity and conservation value of regenerating rainforest and new developments in biodiversity survey methods for regenerating rainforest published. 2 Treetop Manu Biodiversity Technical Report: Assessing Biodiversity &amp; Conservation Value Of The Manu Biosphere covering the biodiversity data collected across Manu’s regenerating rainforests.</p>				
<p><b>Output 5.</b></p> <p>Delivery of a practical, evidence-based, implementable strategy to Manu Biosphere Reserve community documenting the potential for rainforest biodiversity conservation through sustainable development linked to rainforest regeneration.</p>	<table border="1"> <tr> <td data-bbox="620 635 1104 911"> <p>1. Completion and submission to conservation decision makers in Manu and Peru of a written strategy for integrated biodiversity and sustainable development around the Manu Biosphere Reserve</p> </td> <td data-bbox="1104 635 2123 911"> <p>4 project technical reports have been written for Manu National Park and the Manu conservation community documenting the biodiversity conservation potential of the regenerating rainforests of the buffer and transition zones, the potential gains in income and reduced pressure on primary rainforest from sustainable micro-enterprise initiatives and the first Environmental Education and Communication Strategy for Manu (including Financing Plan) that details how biodiversity and sustainable development can be integrated for Manu. This strategy document is now included in the Manu Master management master plan that will drive conservation in Manu over the next 4 years (2018-2022, see Annex 7 for copies of these 4 reports).</p> </td> </tr> <tr> <td data-bbox="620 911 1104 1321"> <p>2. Presentation of project results to conservation managers and decision makers</p> </td> <td data-bbox="1104 911 2123 1321"> <p>Over the last 3 months of the project the results were communicated through local community workshops in Salvacion and at the MLC and in Manu and Cusco to the Manu National Park staff and the Manu conservation community (including representatives of Frankfurt Zoological Society; San Diego Zoo Global; ACCA; the Education Management Units UGEL Manu and UGEL Paucartambo; the Regional Offices of Education of Cusco and Madre de Dios; and the Manu Provincial Municipality).</p> </td> </tr> </table>	<p>1. Completion and submission to conservation decision makers in Manu and Peru of a written strategy for integrated biodiversity and sustainable development around the Manu Biosphere Reserve</p>	<p>4 project technical reports have been written for Manu National Park and the Manu conservation community documenting the biodiversity conservation potential of the regenerating rainforests of the buffer and transition zones, the potential gains in income and reduced pressure on primary rainforest from sustainable micro-enterprise initiatives and the first Environmental Education and Communication Strategy for Manu (including Financing Plan) that details how biodiversity and sustainable development can be integrated for Manu. This strategy document is now included in the Manu Master management master plan that will drive conservation in Manu over the next 4 years (2018-2022, see Annex 7 for copies of these 4 reports).</p>	<p>2. Presentation of project results to conservation managers and decision makers</p>	<p>Over the last 3 months of the project the results were communicated through local community workshops in Salvacion and at the MLC and in Manu and Cusco to the Manu National Park staff and the Manu conservation community (including representatives of Frankfurt Zoological Society; San Diego Zoo Global; ACCA; the Education Management Units UGEL Manu and UGEL Paucartambo; the Regional Offices of Education of Cusco and Madre de Dios; and the Manu Provincial Municipality).</p>
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<p>2. Presentation of project results to conservation managers and decision makers</p>	<p>Over the last 3 months of the project the results were communicated through local community workshops in Salvacion and at the MLC and in Manu and Cusco to the Manu National Park staff and the Manu conservation community (including representatives of Frankfurt Zoological Society; San Diego Zoo Global; ACCA; the Education Management Units UGEL Manu and UGEL Paucartambo; the Regional Offices of Education of Cusco and Madre de Dios; and the Manu Provincial Municipality).</p>				

<p>Activity 5.1 Collate the evidence on the conservation, sustainable development and educational gains made during the project</p>	<p>Evidence collated for a series of project and sector reports on the Manu area and summarised in the 4 projects technical reports in Annex 7.</p>
<p>Activity 5.2 Write a strategy document for the Manu area outlining how rainforest regeneration and sustainable development could be used to impact biodiversity conservation</p>	<p>The greatest risk to biodiversity conservation across the Manu Biosphere and especially in the buffer and transition zones was identified as lack of knowledge, understanding and valuing of the conservation value and protection to the national park of the buffer and transition zones. In response the development and writing of the Environmental Education and Communication Strategy for Manu was led by project staff working with the whole Manu conservation community including in particular the organisations listed above.</p>
<p>Activity 5.3 Present strategy to the Manu conservation community, Peruvian government and future funders</p>	<p>The strategy was presented to the conservation community as described above and has now been incorporated into the Manu Master management plan that will drive conservation across the Manu Biosphere Reserve for the next 4 years.</p>
<p>Activity 5.4 Finish!</p>	<p>Project work completed</p>

## Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
Training Measures							
1a	Number of people to submit PhD thesis	1	UK	Female	The application of biodiversity indicators to infer ecosystem health in regenerating tropical forest	English	This separately funded PhD supported many of the biodiversity survey efforts of the project
1b	Number of PhD qualifications obtained						
2	Number of Masters qualifications obtained	2	Peruvian	1 Female & 1 Male	Regenerating Rainforest Herpetological Biodiversity & Population Ecology	English	1 project staff member and another Peruvian biologist were supported during the project to apply for funding and undertake masters at the University of Glasgow
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)	951	Peruvian			Spanish	265 people attended micro-enterprise training & 686 environmental education via the project workshops
6b	Number of training weeks not leading to formal qualification						
7	Number of types of training materials produced for use by host country(s) (describe training materials)	6			5 biodiversity identification/environmental education guides and 1 children's environmental education story book produced	All Spanish & the biodiversity guides were bilingual with English too	As listed in code 10 of this table
<b>Research Measures</b>		<b>Total</b>	<b>Nationality</b>	<b>Gender</b>	<b>Title</b>	<b>Language</b>	<b>Comments/ Weblink if available</b>
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)	1			The project participants and many other stakeholders helped develop and produce the Manu National Park's Master Plan for 2018 to 2022 which will inform management and		A key part of the action plan is the Environmental Education and Communication Strategy for Manu National Park 2018 – 2022

					protection of the forests of Manu and their biodiversity from 2018 onwards		which will be used to drive integration of biodiversity conservation and sustainability throughout Manu
10	Number of formal documents produced to assist work related to species identification, classification and recording.	5			Species identification guides for rainforest amphibians x2, reptiles, dung beetles, orchid bees and woolly monkey food plants		<ul style="list-style-type: none"> <li>• <a href="#">Field guide to the amphibians for the Manu Learning Centre</a></li> <li>• <a href="#">Field guide to the orchid bees of the Manu Learning Centre</a></li> <li>• <a href="#">Foods eaten by the woolly monkey</a></li> <li>• <a href="#">Reptiles of the MLC</a></li> <li>• <a href="#">Amphibians of the Manu Learning Centre</a></li> </ul>

11a	Number of papers published or accepted for publication in peer reviewed journals	9			Details in annex 5		8 papers are already published and 1 paper is currently under review
11b	Number of papers published or accepted for publication elsewhere						
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1			The GIS biodiversity distribution database recording all the species records for the project		The primary copy of this is held by Crees in Peru
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)						

Dissemination 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.	5					

<b>Physical Measures</b>		<b>Total</b>	<b>Comments</b>
20	Estimated value (£s) of physical assets handed over to host country(s)	£14,000	Camera traps and other equipment for monitoring biodiversity
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established	18	18 field plots setup in the area around the Manu Learning Centre along a gradient of disturbance from mono-culture crops through to primary rainforest to allow long term monitoring of biodiversity response to disturbance and regeneration

<b>Financial Measures</b>		<b>Total</b>	<b>Nationality</b>	<b>Gender</b>	<b>Theme</b>	<b>Language</b>	<b>Comments</b>
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work	£393,158					From matched funding grants listed in section 8

## 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.	
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.	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.	
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.	X
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 6 Darwin Contacts

<b>Ref No</b>	22-003
<b>Project Title</b>	Sustainable Manu: biodiversity conservation through sustainable development and rainforest regeneration
<b>Project Leader Details</b>	
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