



# Project Idea Note (PIN document)

22<sup>nd</sup> July 2015

<b>Project Name:</b>	<b>Conservación del Parque Nacional Cusuco Y la zona de Reserva del Meredón</b> <i>"Conservation of Cusuco National Park and the Meredón Reserve"</i>
<b>Project Location (country, region):</b>	Sierra de Omoa, Honduras
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<b>Date PIN submitted:</b>	July 2015

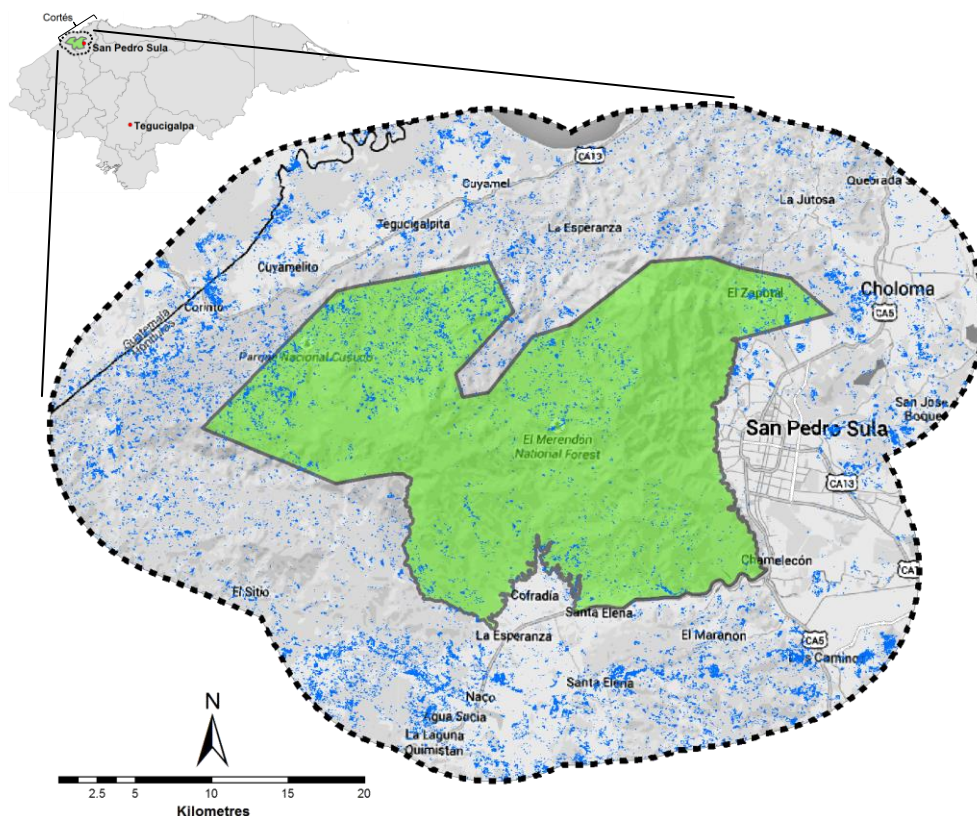


## PROJECT SUMMARY

### Statement of Eligibility & Project Location

*A review of the eligibility, information on the location and size of the project, with brief background on the area*

Cusuco National Park and the Meredón Reserve (north-west Honduras, Central America) consist of lowland tropical rainforest or montane tropical cloud forest (>1,800 metres above sea level) which reproduces naturally, consisting of immigrant or indigenous tree species. The forests have not regenerated by sowing or planting but originated spontaneously from the original forest cover, i.e. reproduced naturally. The total project area of **55,588 hectares** exceeds the minimum eligible area of 20,000 hectares thus allowing the production of a statistically valid risk assessment. Whilst some areas may represent secondary growth forest due to previous deforestation (**Fig. 1**), the vast majority of the area is entirely unmanaged (untouched, non-intervention forest) being a strict forest reserve.



**Fig. 1** The project area of 55,588 hectares (green polygon) includes Cusuco National Park (western part) and the Meredón Reserve (east part) close to the city of San Pedro Sula in the Division of Cortés, north-west Honduras (see insert; top left). Deforestation (blue 30 x 30m cells) between 2000 and 2013 ([www.globalforestwatch.org](http://www.globalforestwatch.org) ©University of Maryland) is shown throughout the project area and surrounding 10km leakage zone (outer dashed line).

The project area comprises two distinct regions: 1) **Cusuco National Park** (17,706 hectares) and 2) the **Meredón Reserve** (39,976 hectares); however, there is a zone of overlap between the two regions of 2,093 hectares (thus, the total project area is *not* the sum of both regions). The centroid coordinates of the project area are 15°30'56.8"N, 88°9'55.37"W.

The project area lies within the Sierra de Omoa Mountains of the Merendón Mountain range. The Sierra de Omoa is isolated by the alluvial Sula valley to the east and Río Chamelecón valley to the southeast and south, the Río Motagua alluvial plain to the west and northwest and the Bahía de Omoa to the north. The area can be divided into subhumid and humid, interior and windward, lowlands and foothills, and mesic highlands, each with characteristic climatic regimes, forest formations and biotic communities.

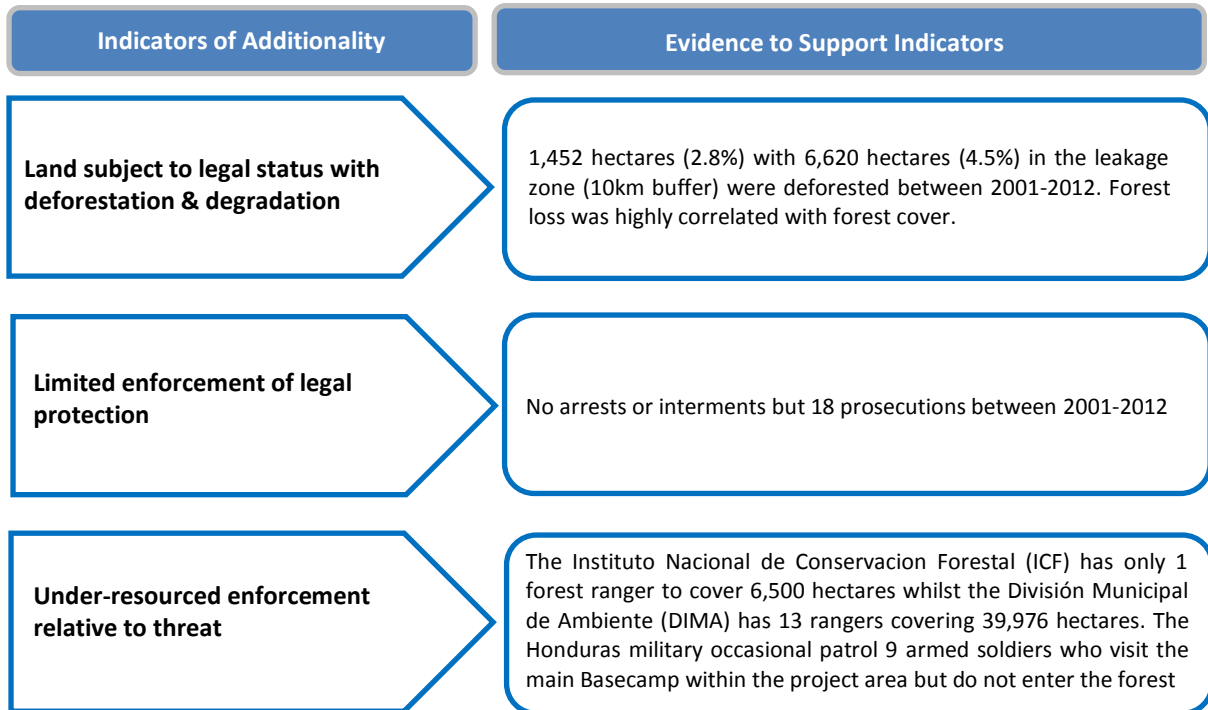
The project area is part of the *Sistema Nacional de Áreas Protegidas y Vida Silvestre de Honduras* (SINAPH) or National System of Protected Areas created by the 'General Law of the Environment Decree, 1992 (No. 104-93, Article 36), to define protected areas in Honduras, such as national parks, natural monuments and biological reserves, and administer management plans, to ensure the protection of nature and heritage. Administration lies (predominately) within the municipalities of San Pedro Sula and Omoa in the Division of Cortés, with a small area under Quimistan in the Division of Santa Bárbara.

### **Commercial Timber Extraction**

Commercial timber extraction ("conducted by a business using heavy machinery for extraction and transport, contracted/hired labour, via skid-tracks, extraction roads and landings with logs taken to an industrial sawmill") is not permitted within the project area. Some forests resources are used by local communities including illegal logging. This activity is not commercial but small-scale with local impact.

### **Restoration Activities**

Protection has largely been legislative (i.e. 'paper') rather than practical. The forests are inadequately protected with few patrols, little or no enforcement (i.e. no prosecutions for illegal activity), and thus remains at high risk of deforestation and degradation (**Fig. 2**) either due to land-use change from natural forest to coffee and cardamom plantations or agricultural pasture. The proposed project includes the aim to halting forest loss with subsequent forest restoration activities, however, these will not be undertaken to fulfil any statutory legal requirement and will be solely as a result of a successful application to the NFS.



**Fig. 2** The project area is protected under the General Law of the Environment Decree, 1992 (No. 104-93, Article 36) but it is legislative ‘paper’-protection rather than practical. The forests are inadequately protected with few patrols and the risk of deforestation and degradation remains high. ‘Additionality’ describes the extent to which the proposed project activities will add conservation benefits with the listed indicators providing evidence that existing protection is inadequate.

<b>Objectives</b>	<i>Summary of main objectives of the project</i>
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This project proposal, whilst authored by [Queen’s University Belfast](#), has been developed in close association with the [Opwall Trust](#) and [Operation Wallacea Ltd.](#) who have supported annual biological monitoring within the project area since 2006.

Opwall believe in conservation through educating and incentivising local communities and/or individuals providing greater financial interest in protecting their local habitat and species than in allowing them to be destroyed. The Opwall Trust has pioneered the concept of tying business development investment in communities that agree to conservation contracts.



Forests play a crucial role in food security, nutrition and poverty reduction (IUFRO 2015) thus we cannot ignore the role of sustainable food production in the project area. Building future food security (alleviating hunger and improving nutrition) requires multi-functional and integrated landscape approaches and community-level engagement to re-imagine sustainable forest use whilst simultaneously conserving the delivery of ecosystem services, including the prevention of CO<sub>2</sub> emissions into the atmosphere and the preservation of biodiversity. Thus, the broad project objectives include:

1. Socio-economic enhancements for the local communities including education, employment and infrastructural improvements contributing to food security (alleviating hunger and improving nutrition);
2. Conservation and preservation of natural forests to **reduce greenhouse gas (GHG) emissions by avoiding deforestation and degradation**;
3. Biodiversity protection of the plants, animals and ecosystem services and functioning;
4. Environmental monitoring.

Project activities aim to mitigate leakage (“environmental impacts that previously occurred within the project area which are displaced to the surrounding area due to project activities”) through;

1. Incorporating a leakage zone of 10km surrounding the project area into the management plan;
2. Strengthening of local forest protection (by patrols) and legal enforcement;
3. Incentivizing local communities to change the way they see and use the forests by;
  - a) *allowing business development within local communities (via micro-finance loans) that use viable and sustainable economic practices (with explicit reference to food security); support local communities through community-level certification, making it financially profitable for local communities to preserve the biodiversity of the area whilst simultaneously alleviating hunger and improving nutrition;*
  - b) *provide alternative means of heat or power generation to reduce reliance on forest resources (i.e. fuelwood);*
  - c) *educating local communities as to the global and local importance of the natural forests and encourage environmental awareness and civic pride;*
  - d) *provide patrols to identify and report degradation to support Government enforcement activities.;*
  - e) *Remove/limit microfinance loans as a penalty if deforestation continues;*
  - f) *Cooperate with Government to encourage and strengthen legal enforcement;*
4. Continued monitoring, management and implementation of biological research and conservation activities within the project area and in conjunction with local communities.

**Communities, Ecosystems and Biodiversity**

*Summary of the key features of the project area*

Honduras is the second largest yet 6<sup>th</sup> poorest of 33 Central American and Caribbean countries and was ranked 129<sup>th</sup> out of 186 countries worldwide on the Human Development Index (HDI) during 2013 (UNDP, 2014). Thirty-six percent of the population have an income less than US\$2 per day. The total population was approx. 8.5M during 2013, 48% of whom lived in rural areas with 19% having access to unimproved sanitation facilities and 11% drinking unimproved water only. The population growth rate was 1.8% per annum in 2013, with a projected population size of 12.7M by 2050 (PRB, 2012) and a rate of urbanization of 3.1%.

**Table 1** Conservation of Cusuco National Park and the Meredón Reserve project in numbers.

Project area metric	Values (units)
Project area	55,588ha or 555.88km <sup>2</sup>
Total area of the Department of Cortés	395,400ha or 3,954km <sup>2</sup>
Population	8,272 people (within project area, 2008) 1.4M people (within Cortés, 2005)
Population density	14 inhabitants/km <sup>2</sup> (within project area, 2008) 353 inhabitants/km <sup>2</sup> (within Cortés, 2005)
GDP per capita	90,629 Lempiras or US\$4,138 (2011)*
Human Development Index (2013)	0.617 (varies from 0-1)†
Mean Years Schooling (2012)	5.5
Ethnicity	Predominantly Ladino (Latin American Spanish) within the project area, with a small minority of Garifuna (African/Arawak descendants) on the coast of Cortés

The Sula Valley is one of the most densely populated and most ecologically degraded areas in Honduras. San Pedro Sula is the second largest city in Honduras and is considered the industrial and economic heart of the country. San Pedro Sula is listed by the UN as one of the most dangerous cities on Earth with 187 murders/100,000 people; mostly associated with street gangs involved in drug trafficking. San Pedro Sula borders the project area to the east with poverty and its growing population putting rapidly increasing pressure on forest resources. The project area is responsible for producing the entire water supply of San Pedro Sula (to the East) and Cofradía and Naco (to the South). Deforestation reduces evapotranspiration and thus convectional rainfall whilst degradation of the upland forest destabilizes soil leading to erosion, water contamination and flash flooding jeopardizing the water supply for approx. 0.5M people.

### **Three key drivers of regional deforestation:**

#### **1. Conversion to agriculture**

The project area is surrounded by 23 settlements (small towns and villages). The primary source of income for these villages is agriculture, with the majority of income generated from coffee plantations (Opwall, *unpublished data*). Most coffee farms are small holder size (IHCAFE, 2008). Other land-use includes subsistence corn (maize) and bean production or cattle farming and cash-crop growth (plantain, fruit, cardamom and tomatoes).

#### **2. Transport routes**

Access to the forest is facilitating by road and track networks with most deforestation occurring around the margins of previously deforested areas (**Fig. 1**). Deforestation prior to 2000 opened up areas in the south and south-east of the Merédon Reserve close to the main arterial road network associated with the city of San Pedro Sula. Deforestation since 2000 has occurred throughout the project area but is concentrated mostly in the north-west of Cusuco National Park (**Fig. 1**). Thus, recent changes have been most rapid in the north-west with the landscape becoming more open facilitating further access by illegal road construction, deforestation and forest degradation.

#### **3. Illegal logging**

Approximately 1,475ha have been deforested since 2000, with most losses around the margin of previously deforested areas yet within mature, primary forest i.e. those areas with highest forest cover (91-100%). Annual deforestation rates have an increasing trajectory (+0.5% per year) with cumulative deforestation exhibiting a near linear increasing trend. Whilst the primary driver for land clearance is likely to be conversion to agriculture, logged trees are equally likely sold illegally to generate immediate income.

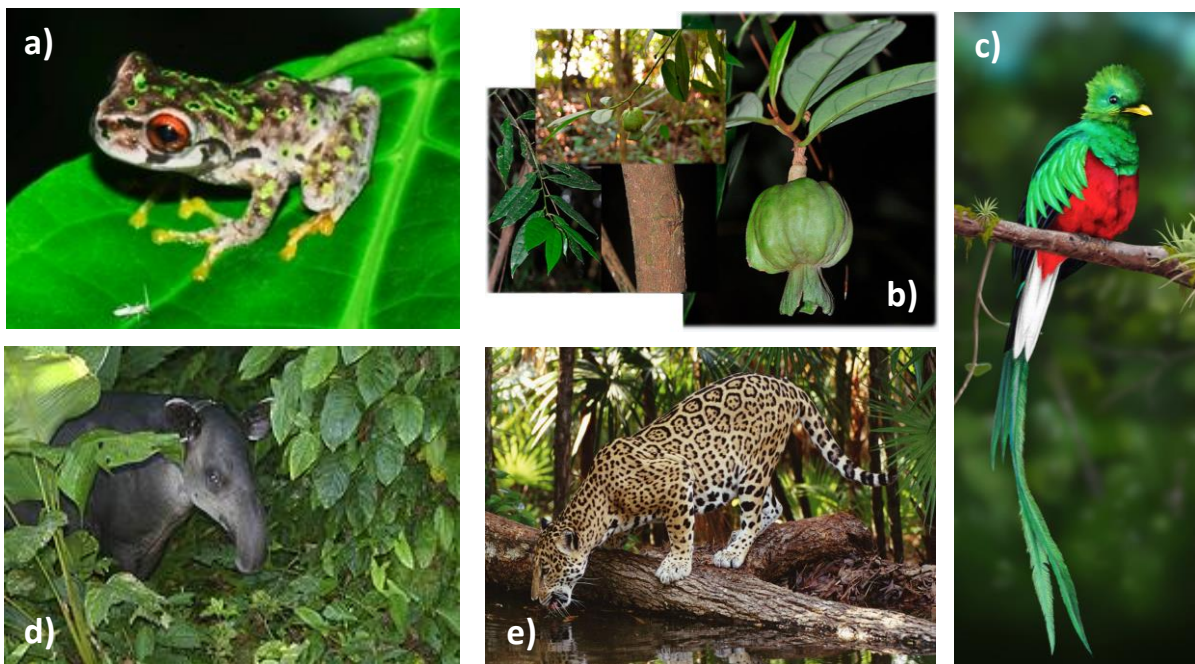


The project area is part of the Mesoamerican Biodiversity Hotspot, a region characterized by exceptional species richness (Conservation International, 2006). This region is a transition zone where flora and fauna which evolved from two distinct, once isolated, biogeographical regions, the Nearctic of North America and the Neotropical of South and Central America and the Caribbean, interact following the formation of a land bridge between the two areas approximately 3M years ago.

The project area contains an incredibly complex landscape with an elevation ranging from 60m to 2,425m. There are four principal natural forest structures; i) tropical lowland dry forest, ii) tropical moist forest, iii) montane (cloud) forest and iv) the bosque enaño or ‘dwarf forest’ occurring at the highest elevations above 2,000m.

The biodiversity of project area is relatively well known due to annual biological monitoring and surveillance conducted by Operation Wallacea since 2006. Cusuco National Park has been ranked in the top 100 most irreplaceable sites, from over 173,000 protected areas, for the conservation of threatened amphibians, birds and mammals, including 25<sup>th</sup> most irreplaceable area for threatened amphibians alone (Le Saout *et al.* 2013). The adjacent Merédon Reserve is less well studied but is larger in extent and similar in elevational gradient to Cusuco National Park except that southern inland facing slopes consist of tropical dry forest; further increasing the region’s beta diversity.

Cusuco National Park is recognized by the IUCN as a Key Biodiversity Area (KBA) due to the overlapping ranges of several globally threatened endemic amphibian species. Since 2006, 102 species of amphibians and reptiles have been recorded, 7 of which are found only in the project area (**Fig. 3a**). The region is also home to an endemic, newly-discovered genus of tree (**Fig. 3b**), 142 species of arachnids, 287 bird species including the Resplendent Quetzal (**Fig. 3c**) and 102 mammal species (23 large mammals, 19 small mammals and 60 bats). The most notable species is Baird’s tapir (*Tapirus bairdii*) which is endangered with declining populations (**Fig. 3d**). The conservation NGO PANTHERA considers the park to be an important corridor for the movements of both puma (*Puma concolor*) and jaguar (*Panthera onca*; **Fig. 3e**).



**Fig. 3** Biodiversity of the project area showing **a)** *Plectrohyla dasypus*, a critically endangered endemic treefrog, **b)** *Hondurodendron urceolatum*, an endemic genus of tree, **c)** the Resplendent Quetzal, **d)** Baird’s tapir, an endangered ungulate prized for its bushmeat and **e)** a jaguar.



<p><b>Carbon Ownership and Land Tenure</b></p>	<p><i>Details land ownership within the project area and land tenure arrangements, including informal land tenure agreements</i></p>
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**Carbon Ownership**

It is our understanding, from initial consultation with Roberto Downing (Cusuco National Park Manager) who has consulted with his colleagues, Marcial Erazo (the ex-Park Manager) and Alex Vallejo (a Honduran Government representative responsible for the project area), that written evidence can be obtained to authorized the transfer of the necessary use rights of the project proponents; including the carbon rights. All subsequent activities in obtaining written permissions will be informed by the principles of Free, Prior and Informed Consent (FPIC).

**Does the project have a legal basis?**

The project proponents (Queen’s University Belfast in collaboration with the Opwall Trust and Operation Wallacea Ltd.) intend to explicitly demonstrate that the necessary rights to carbon and land-use to implement the project, and transact Natural Capital Credits, have been obtained. Documents will be presented in the Project Design Document (PDD) which state that the project proponents hold the necessary legal rights to perform the project activities for the entire crediting period (20 years) with a summary statement by legal advisors who have reviewed the agreement.

We verify, that to the best of our knowledge, the proposed project should not in violate laws, regulations and relevant environmental treaties and agreements surrounding either the protection of the project area or the transaction of the carbon rights and Natural Capital Credits.

**Carbon Benefit Estimates**

*Estimate of anticipated total amount of greenhouse gas (GHG) reduction compared to the “business-as-usual” scenario (optional)*

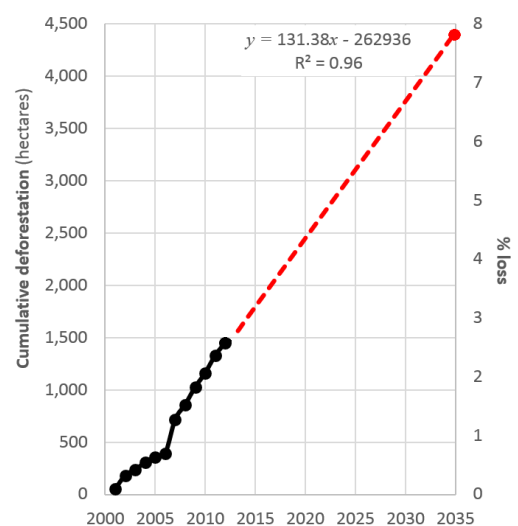
Forests play a significant role in regulating the concentration of carbon dioxide in the atmosphere. Tropical forests, particularly undisturbed moist and rainforests, store approximately half of the world’s living terrestrial carbon pool and over 10% of the world’s soil carbon pool. These forests act as important carbon sinks in the global carbon cycle. Destruction of these forests will, therefore, lead to an increase in carbon dioxide concentration in the atmosphere.

Extensive ground surveys of Cusuco National Park were carried out in 2012 to estimate the carbon stock of the forest using “RAINFOR” field manual methods (Philips *et al.* 2009). All above ground broadleaf trees, conifers, tree ferns and palms were measured at 100 sites. Each plot, measuring 20 x 20m, was sampled directly to calculate the average above ground biomass. Belowground carbon was calculated as a fraction of aboveground carbon. We estimate that mean woody biomass within the project area is 190.7 t/ha. This equates to a baseline carbon stock of 9.8MtC (million tons of carbon).

During 2000, the project area was 95% forested (52,560 hectares of forest within the project area of 55,588 hectares). A total of 1,453 hectares were deforested between 2000 and 2012 yielding a **mean annual deforestation rate of 121 ha/yr**. This equates to a **loss of CO<sub>2</sub> to the atmosphere of 52,484 t/yr**.

The cumulative temporal trend in deforestation between 2000 and 2012 was near linear (**Fig. 4**) with extrapolation over the 20 year duration of the project suggesting **a further 3,000 hectares are likely to be deforested without intervention** (i.e. “business as usual” scenario). In other words, by 2035, twice the area of forest that has already been lost since 2000 will also disappear.

Assuming the “business as usual” scenario we calculate a **Natural Carbon Credit potential of 416,739 tCO<sub>2</sub>/yr** (tons of carbon dioxide per year). The Normative Biodiversity Metric for the project area was estimated at 8.4 (due to the high rate of endemism and the vulnerability of many species present).



**Fig. 4** Cumulative deforestation exhibited a near linear trend ( $R^2=0.96$ ) in the project area since 2000 (black data points and line) with regression extrapolation for the 20 year duration of the proposed project (red dashed line) suggesting that an additional *ca.* 3,000 ha (>5%) may be deforested by 2035 if no intervention is taken.

<b>Management and Governance Structure</b>	<i>Summary of project management team experience and responsibilities</i>
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[Queen's University Belfast](#) (project lead) is a member of the Russell Group of 24 leading UK universities underpinned by world-class research. In the recent Research Excellence Framework exercise (REF2014), Queen's was ranked 8<sup>th</sup> among UK Universities for 'research intensity'. [Dr Neil Reid](#) (Principal Investigator) is Lecturer in Conservation Biology and has four years of experience working within the project area in Honduras and routinely applies for and administers applied conservation grants. Queen's University Belfast will be directly responsible for project management and administration (**Fig. 5**).

The [Opwall Trust](#) is a UK registered charity (number 1078362) and was created in 2000 to provide the focus for funding conservation management interventions at study sites monitored by its sister organization, [Operation Wallacea Ltd](#). The latter is funded by student tuition fees that support annual biodiversity monitoring programmes focusing on tropical rain- and cloud forests. Annual surveys produce valuable data that can be used to monitor the effect of community enterprises on nature conservation. Opwall has been active in Honduras since 2006 collecting a largescale biological monitoring database including habitat monitoring used for the calculation of carbon flux due to deforestation. The Opwall Trust will be responsible for liaising closely with Queen's University Belfast in directing project management whilst Operation Wallacea Ltd. will be responsible for managing in-country logistics with particular respect to monitoring project implementation and outcomes (i.e. deforestation rates and biological monitoring).



**Fig. 5** Project management and governance structure showing direct engagement of Honduran Government Departments, local environmental NGOs, UK-based conservation organisations and Queen's University Belfast.

The Expediciones y Servicios Ambientales de Cusuco (ESAC) is a company based in San Pedro Sula, created by locals during 2007 as an Operation Wallacea spin-off, to manage biodiversity monitoring expeditions to the project area on a sub-contract basis. ESAC is headed by Roberto Downing (Cusuco National Park Manager), Marcial Erazo (the ex-Park Manager) and Alex Vallejo (a Government representative responsible for Cusuco National Park). ESAC also manages increasing wildlife tourist visitor numbers (and hence income) to Cusuco National Park offering short courses such as jungle training, providing facilities for visiting university training courses and running birding and trekking weekends. In addition, ESAC runs the coffee purchasing for the [Wildlife Conservation Products](#) scheme (Fig. 6) where enhanced prices are offered to village co-operatives for products in exchange for the village agreeing to no logging, hunting or encroachment of the forest/farm boundaries. ESAC will be responsible for the delivery of project objectives on-the-ground (e.g. organizing and delivering education programmes, employing park patrols etc).



**Fig. 6 a)** A local villager from the village of Buenos Aires sorting recently harvested coffee beans for **b)** the Wildlife Conservation Products coffee range.

The National Institute of Forest Conservation, known as the [Instituto Nacional de Conservación Forestal](#) or ICF in Honduras, serve as a permanent public environmental initiative, focusing private investment and international cooperation in protected areas which are part of the National System of Protected Areas or *Sistema Nacional de Áreas Protegidas y Vida Silvestre de Honduras* (SINAPH). The public institutional framework for protected areas in Honduras is mainly formed by ICF, through the Department of Protected Areas or *Departamento de Áreas Protegidas* (DAP). The latter are responsible for implementing forestry policy, coordinating with stakeholders and leads the implementation of plans and strategies for the conservation of protected areas. The División Municipal de Ambiente (DIMA), the Municipal Environmental Division of San Pedro Sula and are responsible for the administration of the Meredón Mountain Reserve and its surroundings. Together, ICF, SINAPH, DAP and DIMA will provide a Governmental Governance Panel which will oversee and sanction project activities (Fig. 5).

<b>Stakeholders, Beneficiaries and Expected Social and Biodiversity Impacts of Project</b>	<i>Summary of who will be affected by the project; how they will benefit; how the project's activities will impact communities and biodiversity</i>
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The main beneficiaries should be the local people. Many of the projects main activities will be sub-contracted to Expediciones y Servicios Ambientales de Cusuco (ESAC). This local company will be funded, using monies generated by the sale of Natural Carbon Credits, to employ additional staff including project area rangers to make regular patrols and education staff to visit schools and communities to raise awareness of the project, generate project engagement and develop an appreciation for what the forest can deliver sustainably to local peoples. We take much inspiration from initiatives such as the unarmed 'Black Mambas', the first all-female anti-poaching unit in Africa, within the Balule Nature Reserve of the Greater Kruger National Park. Like Africa, Honduras has huge problems with gun violence including the targeting of environmental activists. We have no aspiration to put further guns on the ground by using armed patrols and believe that following the African model may reduce the potential for violent encounters during patrols. Employing women will also develop positive female role models for local children whilst empowering communities.

Local communities will also benefit from capital investment. Business development will be stimulated by funding micro-finance loans making it financially profitable for local communities to preserve the biodiversity of the area whilst utilizing forest resources sustainably (**Fig. 6**). Moreover, funds will be invested in providing alternative means of heat or power generation (for example, using [biomass generators](#)) to make best use of unutilized resources, i.e. burning maize husks to reduce reliance on forest fuelwood.

Local communities will be future-proofed by educational programmes that engage children in project activities. These will include classroom visits, field trips and mini-research projects to fully involve children and teachers. Educational packs will be put together (in Spanish and English) for wider distribution (i.e. children can take these home to their parents). Community meetings and evening lectures will also be held in the same villages to allow information to be disseminated simultaneously to adults.

Whilst the major beneficiaries will be the local communities, the major stakeholder will be the Honduran Government. The Instituto Nacional de Conservacion Forestal (ICF), Sistema Nacional de Áreas Protegidas y Vida Silvestre de Honduras (SINAPH), Departamento de Áreas Protegidas (DAP) and División Municipal de Ambiente (DIMA) are primarily responsible for the protection of the project area. However, the socioeconomic situation in Honduras is such that little or no funding is available making effective protection impossible. Thus, by investing monies levered from the sale of Natural Carbon Credits, we hope to provide the funding necessary to achieve the Government's objective of effective protection of National Parks and Reserves.

It is hoped that through effective protection measures, reduction of deforestation and forest degradation, we will halt forest loss and prevent the release of CO<sub>2</sub> into the atmosphere over the next 20 years that would otherwise be generated by *business-as-usual* activity. Local community engagement with the project will be explicitly demonstrated by community-level certification further raising awareness and pride in using local forests sustainably. Certification will be contingent on little or no change in the agriculture-forest boundary. Thus, the initial aim is to halt forest, and associated biodiversity loss, whilst a later aim may be to stimulate forest regeneration in already deforested patches. This project will run alongside the work of the Opwall Trust and Operation Wallacea in the project area, who currently partly fund a PhD based at Queen's University Belfast on "*Assessing vulnerabilities of large mammal populations in remnant Neotropical cloud forests*". Work over the next three years will focus on quantifying the impact of local communities, in terms of illegal hunting, on large mammals including the endangered Baird's tapir and other species hunted for their meat, principally, red brocket deer, white-tailed deer and white-collared peccaries. We envisage synergy between the current proposed NSF project and existing research and biological monitoring. Thus, educational engagement will include aspects of sustainable forest use including reducing dependency on illegal bushmeat. Biological monitoring by Operation Wallacea will be central in demonstrating changes in the agriculture-forest boundary, obtaining and analyzing satellite imagery, monitoring changes in the quality of forest monitoring plots and quantifying the impact of the project on forest biodiversity, most notably large mammals.

### Timescale

The projects has been initially envisaged to have a minimum duration of 20 years consistent with permanent conservation and carbon storage.

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