

REGROW BORNEO



PILOT YEAR IMPACT REPORT

An exciting journey of ecological restoration and sustainable tropical reforestation in the forests of Borneo.



Sustainable Places
Research Institute
Sefydliad Ymchwil
Mannau Cynaliadwy





A MESSAGE FROM THE CHAIRS OF REGROW BORNEO

It has been a little over a year since we launched our project in October 2019, and none of us could have predicted the challenges of developing a reforestation programme during a global pandemic. We hope that you and your loved ones have made it through this difficult period safely and thank you for supporting us through this journey. A year on, as the rainy season and another movement control order closes in on our team in the Kinabatangan, Borneo, the pause in planting allows us some time for reflection on what can only be described as a successful 12 months. We have planted 3 Ha of forest, with a further 2 Ha in preparation, and have been able to help support the economic challenges of the COVID pandemic for our Malaysian partners.

Regrow Borneo was launched with the aim of restoring tropical forests logged for timber or oil palm agriculture in an ethical, transparent, and research-led manner. The project draws on the longstanding collaboration between Cardiff University's Sustainable Places Research Institute and the Danau Girang Field Centre (DGFC) in Borneo, to support research into the role of active restoration of tropical forests for the improvement of people and the environment.

Regrow Borneo is a tropical reforestation project that offers a more holistic approach than simply growing forest to store carbon. Our project seeks to understand how community-based tropical forest restoration can address the following outcomes:

- Sequester carbon
- Improve biodiversity and support conservation of local ecologies
- Sustain local livelihoods and culture
- Improve scientific understanding of the environmental, economic, social and cultural impacts of tropical reforestation
- Provide opportunities for institutions and individuals to mitigate their own unavoidable carbon emissions through support for tree-planting

We launched our pilot year in October 2019 to demonstrate that we could address these goals within our project. Our initial target was to raise £15,000 to launch the reforestation program.

We began by encouraging Cardiff University staff, visitors to DGFC and the wider community to donate if they had to fly, to mitigate emissions on essential travel. By February we had reached our target. However, planting plans for the dry season beginning in March were halted by COVID. Despite this setback, donations continued to arrive and by June 2020, we had reached an impressive £20,000. Plans were agreed with our local partners to plant 5 hectares as soon as conditions allowed. This would translate to approximately 12,500 trees.

Once local lockdown rules were relaxed, our teams made incredible efforts to make up for lost time. Three hectares were cleared of grass and vines in what was often searing heat. There was pressure to complete as much as possible, knowing that the rainy season was fast approaching and that some areas would soon be under water. An incredible 4,100 saplings were planted within three weeks, working around any existing trees. While we were disappointed that the rainy season cut our already short planting season shorter, we have a further 8,400 healthy saplings ready to be planted as soon as the seasonally flooded areas dry out.

It is hard to know the impact of the pandemic over the coming months or years, particularly on our lives, our livelihoods, and how we will do business in the future. However, the pandemic has highlighted the important role that forests play in buffering us from disease. Also, it has shown that a near global lockdown has very little effect on the emission of carbon dioxide.

The urgency of the climate and ecological emergency is as real as ever. Projects such as Regrow Borneo offer practical, long term responses to help address this emergency. From carbon sequestration, restoring degraded land into a vibrant and functioning ecosystems, to preventing future pandemics by restoring the buffers between people and wildlife; we take our role in restoring these lands, for nature, for wildlife, for local communities - and for all futures, very seriously.

With the success of our pilot year, we are looking forward to taking our exciting project into its next phase. We look forward to receiving any further donations that you might be willing to provide and to continue to reforest the Kinabatangan floodplain.

With gratitude,
Dr TC Hales & Prof Benoit Goossens.



GOVERNANCE AND OVERSIGHT

Regrow Borneo Steering Group

Cardiff University

Dr. T.C. Hales (RB Co-Chair), Director Sustainable Places Research Institute
Professor Mike Bruford, Dean of Sustainability
Emeritus Professor Susan Baker, Co-Director Sustainable Places Research Institute
Professor Andrew Weightman, Head of Organisms and Environment Division, School of Biosciences
Dr Katrina Henderson, Environmental Safety Officer
Professor Carrie Lear, School of Earth and Environmental Sciences
Siân Stephen, Institute Manager, Sustainable Places Research Institute
Sarah Evans, (Former) Institute Manager, Sustainable Places Research Institute
Janet Sullivan, Executive Officer - Finance
Julia Komar, Ethical and Environmental Officer, Cardiff Student Union
Flavie Loos, (former) Ethical and Environmental Officer, Cardiff Student Union
Matthew Quinn, Distinguished Visiting Fellow, Sustainable Places Research Institute

Danau Girang Field Centre

Professor Benoit Goossens RB Co-Chair, Director
John Robertson, Director of Public Relations and Development

Research Committee

Danau Girang Field Centre

Professor Benoit Goossens (RB Co-Chair), Director
John Robertson, Director of Public Relations and Development
Amaziasizamoria Jumail, Research Officer and RB Field Manager
Ashraft Yusni, Research Assistant
Dr Lauren Gilhooly, Lead for Regrow Borneo Social Science component
Richard Burger, Regrow Borneo Field Coordinator & PhD Candidate

Cardiff University

Dr. T.C. Hales RB Co-Chair, Director Sustainable Places Research Institute
Professor Mike Bruford, CU Dean of Sustainability
Emeritus Professor Susan Baker, Co-Director Sustainable Places Research Institute

KOPEL Bhd

Martin Vogel, Chief Executive Officer



KEY ACHIEVEMENTS

Tree planting for research and carbon sequestration

TREE PLANTING

Between July and September 2020, 4,100 trees were planted on 3 hectares of land. These were in 2 hectares of degraded forest in the Pin Supu Forest Reserve (Kaboi Lake) that sits adjacent to the Kinabatangan River and 1 hectare at the Ladang Riparian Reserve.

In total, 4 separate areas have been identified for these first waves of planting. These are:

- (a) Kaboi Stumping Site - 2 hectares of riparian forest
- (b) Kaboi Lake Site - 2 hectares of seasonally flooded freshwater swamp forest
- (c) Laab Swamp Site - 1 hectare of seasonally flooded permanently waterlogged freshwater forest
- (d) Ladang Riparian Reserve - 1 hectare of riparian reserve

The more recent addition of the Ladang site, which offered the benefit of being easily accessible from the river and presenting a low risk of tree mortality increased our initial restoration target from 5 to 6 hectares.

The planting work is both planned in conjunction with, and executed by, the KOPEL Community Ecotourism Co-operative of the Batu Puteh Community*. This community represents four local villages and works to support sustainable alternative livelihoods for local people, the conservation of forests and biodiversity, as well as supporting the skills development and training needs of the local community. The first step in the process is land clearing: meaning cutting back the grass and vines that would impede the growth of the saplings. Lockdown measures were eased in July allowing this work to begin.



*http://www.mescot.org/mescot_village_cooperative.htm

KEY ACHIEVEMENTS

Tree planting for research and carbon sequestration



TREE DENSITY

In areas that were completely deforested, planting was at a density of 2,500 trees per hectare, to achieve optimum canopy cover in the long term. In areas which had been partially deforested, planting was at a lower density, ensuring existing trees were preserved. Planting density may also vary by terrain.

A further 8,400 trees are ready to plant in the next dry season, in March/April 2021, although clearing work may continue.

The planting sites are protected by the Sabah Forestry Department (Pin Supu Forest Reserve) and the Sabah Department of Irrigation and Drainage (Ladang Riparian Reserve).

CARBON SEQUESTRATION

Tropical forests are extremely efficient at removing carbon dioxide from the atmosphere and storing it as wood or in soil. In order to measure the impact and carbon sequestration at the site over time, measurements have been taken at all sites.

Four separate sites were identified for planting; selected as they represent some of the important differences in soil type, hydrology, and potential to store carbon that are found in the area.

As a first step, a monitoring plot was set up in each location. The wood mass of dead branches and stems were measured, as well as the mass of grass and vines removed during the clearing. Existing trees have been tagged and measured to calculate their carbon content and will be identified at species level in the coming weeks.

As was referenced in the introduction, although funds to plant 12,500 saplings were raised during our pilot year, the challenges of working around the COVID 19 pandemic hindered our ability to complete the planting this season. Planting during the rainy season, where some sites will be flooded is not recommended, however our intention is to complete this work as soon as conditions allow, at the two other sites, Kaboi Stumping Site (2ha) and Laab Swamp Site (1 ha).

KEY ACHIEVEMENTS

Support Ecosystems: Improve biodiversity and support conservation of local ecologies

SITE 1: Kaboi Lake (2 hectares of seasonally flooded freshwater swamp forest)

LOCAL NAME	SCIENTIFIC NAME	%	PIONEER/ CLIMAX*	FLOOD TOLERANT	USE BY NATIVE FAUNA
Bongkol	Nauclea sp.	86%	Pioneer	Flood Tolerant	Wildlife Food
Terosob	Dracontomelon sp	8%	Climax	Short Flood Tolerant	Wildlife Food
Binuang	Octomeles sumatrana	4%	Pioneer	Short Flood Tolerant	Not Food
Salongapid	Mallotus muticus	2%	Pioneer	Flood Tolerant	Wildlife Food
		100%			

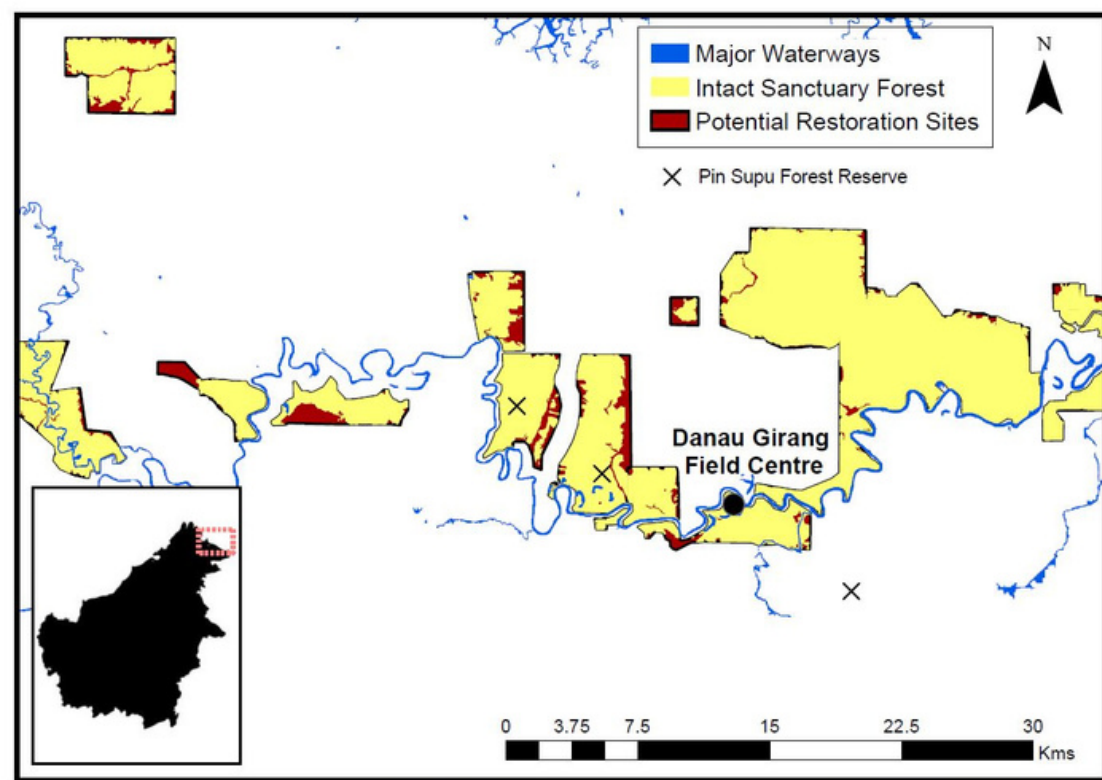
TREE VARIETIES

Regrow Borneo sites are planted with a range of native tree species, selected by our local partners, KOPEL Bhd, based on their experience of restoration in the area.

In the Pin Supu Forest Reserve these were a mix of 10 native species, which offer a range of characteristics including pioneer or climax, growth rate, flood tolerance, fire resistance and use by native fauna.

*A pioneer species is a species that quickly invades disturbed areas, a climax species is a plant species that will remain essentially unchanged in terms of species composition for as long as a site remains undisturbed. Usually they are the most shade-tolerant species of trees to establish in the process of forest succession.





A typical, healthy, mature hectare of Borneo rainforest will store between 550 and 1100 tonnes of carbon dioxide.

*On average 4.4 tons of carbon is stored **per annum** in a hectare of regrowing tropical forest.*




KEY ACHIEVEMENTS

Support Ecosystems: Improve biodiversity and support conservation of local ecologies

SITE 2: Ladang Kingabatangan Riparian Reserve (1 Hectare riparian buffer zone)

LOCAL NAME	SCIENTIFIC NAME	%	PIONEER/ CLIMAX	FLOOD TOLERANT	USE BY NATIVE FAUNA
Bongkol	Nauclea sp.	46%	Pioneer	Flood Tolerant	Wildlife Food
Kelumpang	Sterculia sp.	31%	Climax	Short Flood Tolerant	Wildlife Food
Binuang	Octomeles sumatrana	10%	Pioneer	Short Flood Tolerant	Not Food
Mangkapon	Colona serratifolia	7%	Pioneer	Short Flood Tolerant	Unknown
Terosob	Dracontomelon sp.	2%	Climax	Short Flood Tolerant	Wildlife Food
Nyatoh	Palaquium sp.	2%	Climax	Short Flood Tolerant	Wildlife Food
Durian	Durio sp.	1%	Climax	Non-Flood Tolerant	Wildlife Food
		100%			





Bornean forests are home to species like the Bornean orangutan, Bornean elephant, sun bear, Sunda clouded leopard, proboscis monkey and eight species of hornbills.

KEY ACHIEVEMENTS

Community benefit: Sustain local livelihoods and culture



Our goal is to ensure that our practice is ethical, transparent and that it delivers real benefits to local communities. For this reason, the social impacts of the project will also be formally studied.

The planting and clearing work was undertaken by a group of community members who were paid a fair wage for their labour. The group is balanced in terms of gender and age, and equal pay has been guaranteed*.

As a result of the COVID pandemic, local communities along the Kinabatangan River have seen income sources related to ecotourism plummet. This is an area where few alternative employment options exist beyond palm oil plantations. The income provided under the agreement with Regrow Borneo provided an important lifeline over the past few months. The social science research is investigating other potential income source from the reforestation, including ecotourism and handicrafts [for example, making rattan gift products].

*Moreover all partners and service suppliers (including international partners) are required to comply with our equality and diversity policy in their employment practices and in delivering services on our behalf.

Between 1990 and 2015, the richest 10% of people globally* produced half of Earth's climate-harming fossil-fuel emissions*. The poorest half of the world's population contributed a mere 10%

*Defined as 630 million people with incomes above about \$35,000 (£27,000) a year

*Confronting Carbon Inequality. OXFAM September 2020. <https://www.oxfam.org/en/research/confronting-carbon-inequality>



KEY ACHIEVEMENTS

Research: Improve our scientific understanding of the environmental, economic, social and cultural impacts of tropical reforestation



Regrow Borneo has begun measuring the impact of planting trees on carbon sequestration, biodiversity, ecosystem resilience, and community health. This has included the development of botanical plots, the measurement of different stores of carbon within these plots, and the emplacement of camera traps. Our research licenses have been approved by the Sabah Biodiversity Centre. The COVID pandemic has slowed the development of the community social science research.

We measure all of the carbon components (both above-ground and below ground) using field and drone measurements. These measurements form a baseline that can be compared over time and enable calculations of carbon sequestration per hectare of land in this restored forest. Camera trapping allows for periodical monitoring of the wildlife to take place.

"For the past 12 years, DGFC has gathered useful and relevant natural science information regarding the landscape-level requirements critical for the viable persistence of tropical species in the highly fragmented and oil-palm dominated landscapes of the Kinabatangan floodplain. Now, it is in our hands to be able to increase functional connectivity throughout this landscape and improve the conservation status of key species in the area by restoring and enhancing degraded forests crucial for their survival." (Prof Benoit Goossens)

The Social Science team have developed ethical guidelines for the conduct of this research in collaboration with our community partners. Desktop research has been completed, examining the literature on community reforestation and the methodological approaches to co-production (or working together with the community to achieve a collective outcome). A household survey will be rolled out in the early New Year. Due to COVID-19 restrictions, this survey will be delivered by a local community member. Other methods to be employed for baseline data collection are delayed at present.

KEY ACHIEVEMENTS

Carbon Mitigation: Provide opportunities for institutions and individuals to mitigate their own unavoidable carbon emissions through support for tree-planting.

We have undertaken work to identify appropriate levels of donations, linked to the real costs of tree planting and carbon sequestration rates of the forest. These include the labour costs throughout the process, from developing seedlings, to clearing and planting a hectare of tropical forest, to regular maintenance for 3 years. We also include the costs of maintaining accurate measurements of the carbon sequestered within each hectare (one rugby pitch) of forest. All of these costs lead to an average cost to plant a hectare of tropical forest of £5000 (or an average of £2 per tree). This price is an average as it reflects variation in the location selected (and necessary planting density for the land type), soil type (which controls how much carbon is contained), hydrology (which affects the survivorship of the trees), the travel distances (often by boat) and the amount of staff time required at any given site.

Until we develop data about sequestration in our particular sites, we have calculated potential carbon sequestration based on measurements from the literature of similar forests in Borneo*. These calculations will be improved through time based on the results of our monitoring programme.

We publish all of our methods, and have provided a map for calculating the donation amounts linked to mitigating emissions from essential air travel from Cardiff and the UK, which can be found here: https://www.cardiff.ac.uk/data/assets/pdf_file/0016/1701124/Regrow_Borneo_map_final-1.pdf

*Saner, P., Loh, Y. Y., Ong, R. C. & Hector, A. Carbon stocks and fluxes in tropical lowland dipterocarp rainforests in Sabah, Malaysian Borneo. PLoS One 7, (2012). Philipson, C. D. et al. Active restoration accelerates the carbon recovery of human-modified tropical forests. Science (80-.). 369, 838–841 (2020).

The global average for carbon dioxide emissions from consumption in 2017 was 4.7 tonnes of carbon dioxide per person. The UK average was 8.34 tonnes per person.*

*<https://www.independent.co.uk/environment/british-carbon-footprint-africa-emissions-oxfam-climate-change-a9271861.html>
(Data from Global Carbon Atlas)



FINANCIAL REPORT

PILOT YEAR INCOME

Fundraising for the first year of the project exceeded expectations.

At the launch of Regrow Borneo, a JustGiving page was set up to receive donations, <https://www.justgiving.com/fundraising/regrowborneo> with a stated target of £15,000 for the pilot year. We were able to make use of the charitable infrastructure of Cardiff University for this purpose.

Donations were initially encouraged as a means of offsetting unavoidable air travel, which offered an easy way to communicate a tangible reason for donations. A map was developed with suggested donation amounts needed to mitigate emissions for journeys to different destinations, using Cardiff as a departure point. The messaging encouraged the use of more sustainable alternatives to flying wherever possible.

Donations arrived steadily prior to the lockdown caused by COVID-19, and we reached our donation goal of £15,000 in February 2020. It was encouraging that donations continued to be made throughout the following months despite, aided by updates on social media or donor updates on our progress. This demonstrated that our supporter base had connected with the wider aims of the project – of reforestation, support for biodiversity and local communities, which has sustained the project despite reduced air travel.

By 17 September 2020, as our pilot year completed, we had raised a total of £22,621.10 from 261 donations. While many donations were initially linked to Cardiff University and DGFC, contributions were later received from across the world, in GBP, USD, EUR, AUD, CAD, AED, SGD.

We received one (offline) donation of £5,000 and 12 donations of £200 or over, with the remaining donations composed of lower average amounts. Donor names are listed on our JustGiving page*. We are truly grateful to all who helped make this project a reality.

*Where anonymity not requested

INCOME

Online donations (all currencies) in GBP received via JustGiving	£15,777.60
Gift Aid on UK online donations	£1,843.50
Offline donations	£5,000.00
Subtotal	£22,621.10
Just Giving Fees *	-£413.00
Total Income Received	£22,208.10

*Just Giving Fees: Cardiff University uses JustGiving as its online giving platform to provide an easy and secure way for individuals to fundraise for their chosen cause. <https://justgiving.charity-support.zendesk.com/hc/en-us/articles/204663347-What-are-your-fees-UK>

Average cost per tree for Regrow Borneo:
£2

Average cost per hectare (density of 2,500 trees per ha) = £5,000

FINANCIAL REPORT

PILOT YEAR INCOME

Expenditure for the Pilot Year

All funds raised via JustGiving during our pilot year will go directly towards tree planting activities.

Tree planting activities include:

- The purchase of saplings gathered from seeds collected in the forests
- Land clearance before planting
- Transport of saplings and workers to sites
- Planting work
- Maintenance of planting sites

This work is undertaken by our partners KOPEL, while the Danau Girang Field Centre leads the in-situ research work.

At the close of the pilot year, of the £22,208.100 GBP received, £19,948.33 GBP* had been transferred to the Danau Girang Field Centre to administer the replanting of deforested land. A partial payment of MYR 24,152 (£4,447.43) has been made to KOPEL, for the replanting of the initial 3 hectares. A second invoice is due shortly.

OTHER INCOME AND EXPENDITURE

The research component of the Regrow Borneo project has been managed separately.

The project received support worth £9,000 from the Sustainable Places Research Institute, to develop the social science research component and for the purchase of a drone for measuring above-ground carbon in support of the physical science research.

The Danau Girang Field Centre contributed £6,150 to the Regrow Borneo project, by supplying a research project manager, research assistant and boat use, the associated fuel, and equipment for the research.

*105,927.08 MYR. Kopel has only claimed 24,162 MYR.

BALANCE

The balance for the pilot year is £17,761

Total Tree Planting Income (JustGiving)	£22,208.10
Total Expenditure	£4,447.43
Balance	£17,760.67

With the remaining balance available, Regrow Borneo will complete the work at the agreed identified sites.

YEAR 2

The coming months will see an increase in monitoring and maintenance activity. Tall grasses and vines will need to be cleared periodically at the Ladang and Kaboi Lake sites, to prevent shading or choking of our saplings. We will monitor closely tree survival rates at each site, which are expected to vary, some of which could flood multiple times before the end of the rainy season. Maintenance will take place for 3 years.

Our ability to restore further sites will depend on the success of our fundraising over the coming months. We will seek to develop our individual giving program and work is also underway to secure grant support and corporate investment, which will also support the research components of our work.



Contact us
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@RegrowBorneo

Regrow Borneo is a joint venture between the Sustainable Places Research Institute at Cardiff University and the Danau Girang Field Centre, Borneo

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"The one who plants trees, knowing that he will never sit in their shade, has at least started to understand the meaning of life." (Rabindranath Tagore)