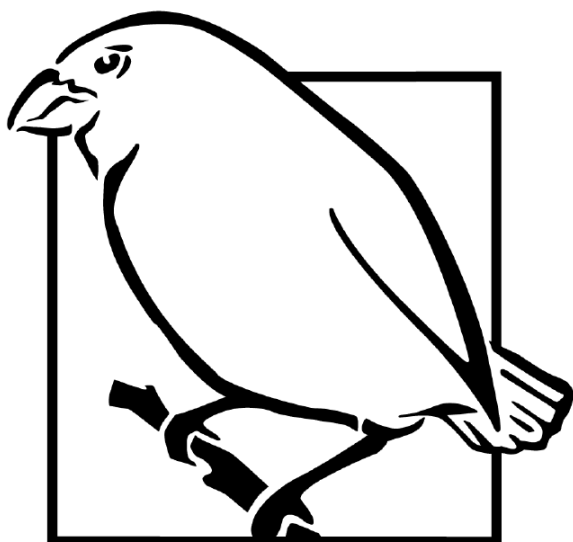


Newsletter

September 2021



The landings beach at Sainte Luce, Madagascar, Credit: SEED Madagascar



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Funded by the UK Government, The Darwin Initiative provides grants to support developing countries to conserve biodiversity and reduce poverty, with Darwin Plus focusing its grants on the natural environment and climate change in the UK Overseas Territories (OTs).

Projects support:

- the Convention on Biological Diversity (CBD)
- the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- the Nagoya Protocol on Access and Benefit-Sharing (ABS)
- the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
- the Ramsar Convention on Wetlands
- the Convention on the Conservation of Migratory Species of Wild Animals (CMS)
- the United Nations Framework Convention on Climate Change (UNFCCC)
- the Global Goals for Sustainable Development (SDGs)



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Women participation in alternative livelihood opportunities, Nepal Credit: ZSL

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Lobster landed at Manafiafy beach (Sainte Luce), Madagascar, Credit: SEED Madagascar

Publicity and information about the Darwin Initiative

For more information on the Darwin Initiative including details about current and completed Darwin Initiative projects, and their final application forms, please visit darwininitiative.org.uk. For Darwin Plus, please visit dplus.darwininitiative.org.uk.

We also have a blog, that includes news and thoughts on issues being tackled by the Darwin Initiative – both at the project and programme level. You can read it here blog.darwininitiative.org.uk

We're also keen to share other Darwin project blogs. If you have a blog you'd like to share on our website, please get in touch at darwin-newsletter@ltsi.co.uk

Publicity and referencing Darwin Initiative

We kindly remind project leaders that if they are publicising their work then it is important that they make every effort to mention Darwin Initiative funding. This is important as it helps us to ensure the Darwin Initiative retains a high profile and secures continued Government funding.



Farmers being supplied with certified seeds to enhance climate-smart agriculture at the Tana River Delta, Credit: George Odera

A word from Darwin

On the journey towards the **COP 26 UN Climate Change Conference** in Glasgow, the “Our Changing Climate” edition of the Darwin Initiative newsletter celebrates both our past and present Darwin and Darwin Plus projects and their contributions to tackling climate change through improving resilience and empowering those most at risk.

The effects of climate change are now undeniable, with some of the world’s most impoverished communities suffering the full force of more intense and frequent droughts, hurricanes, monsoons and prolonged periods of famine. Human wellbeing and the health of our environment are intrinsically linked. Through focusing on poverty reduction, helping people adapt to these changes by promoting more biodiversity friendly sustainable livelihood options, and restoring habitats to help mitigate climate change, our projects help tackle the climate challenge.

We would like to take this opportunity to commend those projects that were successful under Round 9 of Darwin Plus and Round 27 of Darwin Initiative. On behalf of the Darwin team, we would like to extend a warm welcome to those projects that were successful. We look forward to working together, and from hearing from you in future editions of the newsletter! Further information on the new Darwin Plus projects can be found [here](#) and new Darwin projects can be found [here](#).

If you are interested in joining the Darwin family, **Round 28 of Darwin Initiative main** is currently open.

We hope you enjoy this edition of the newsletter, and wish the very best of luck to our applicants!



A woman helps weigh in lobster catch from the day, Madagascar, Credit: SEED Madagascar

Building resilience through community-based fisheries management in Anosy, Madagascar

In the Anosy region of southeast Madagascar, a string of rural fishing villages runs along the coast. Often isolated from larger villages and towns inland, these communities are heavily reliant on marine resources for their livelihoods. Many partake in the small-scale lobster fishery - as a high-value commodity, lobster provides a critical income to impoverished households with few other viable livelihood options. However, this dependence on the sea leaves fishing households especially vulnerable to climate change, in an area where local knowledge already points to significantly declining lobster stocks.

Project Oratsimba, run by SEED Madagascar and funded by the Darwin Initiative, sought to address these declines and build resilience within two such rural fishing communities—Elodrato and Sainte Luce. Over the course of three years, Project Oratsimba worked in collaboration with these communities to promote sustainable, community-based management of the lobster fishery.

“ The Anosy region is currently experiencing its worst drought in over 40 years, resulting in famine conditions - the first famine in modern history driven entirely by climate change ”

The impacts of climate change are already being felt acutely in Madagascar. The Anosy region is currently experiencing its worst drought in over 40 years, resulting in famine conditions - the first famine in modern history driven entirely by climate change. Fishers in Elodrato and Sainte Luce are all too familiar with the impacts of climate change already, with stories of rougher and more unpredictable seas impacting how often they are able to fish, and the income they can bring home to their families. A changing climate also means that migrants throughout Madagascar are flocking to the coast, with the high price fetched by lobster a promising prospect after failed harvests inland or scant fishing grounds elsewhere.

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With community wellbeing closely tied to the health of the environment, fishers in Elodrato and Sainte Luce were motivated to take management of the lobster fishery into their own hands

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With community wellbeing closely tied to the health of the environment, fishers in Elodrato and Sainte Luce were motivated to take management of the lobster fishery into their own hands, ensuring the fishery would remain a viable livelihood throughout their lifetimes and those of future generations. With the support and facilitation of SEED, the journey towards sustainable fisheries management, and greater resilience to a changing environment, began.

SEED connected the communities with crucial contacts and partners, garnering state support from the regional fisheries ministry, and national support from MIHARI, Madagascar's Locally-Managed Marine Area (LMMA) Network, which specialises in sharing resources and knowledge between fishing communities throughout the country. Training, cross-visits, and outreach sessions helped build the capacity of local fishers and those throughout the supply chain, giving fishers from Elodrato and Sainte Luce a glimpse into how similar communities managed their own fisheries. This collaborative knowledge-building ultimately led to the strengthening of the Sainte Luce LMMA and the establishment of an LMMA in Elodrato, which combined now protects 310km² of marine habitat in southeast Madagascar.

Both communities also ratified a “dina”, or local law, outlining the responsibilities of the fishers in the area, and setting management measures aimed at securing the lobster fishery. With regulations such as a ban on environmentally damaging fine-mesh nets and reiterating national fisheries policy such as a Minimum Landing Size, these dina lay the groundwork for effective community-based fishery management. Critically, both communities also elected to create periodic no-take zones (NTZs), areas that remain closed to lobster fishing for part of the year to promote stock recovery and ease overfishing. Protecting lobsters, a keystone species in

rocky reef ecosystems, and securing the lobster fishery allow both social and ecological resilience to be built.

A key focus of Project Oratsimba was also the inclusion and empowerment of women. Though women play a valuable role in the lobster supply chain - often gathering bait, weaving lobster pots, acting as intermediaries, and managing daily finances - their role in fisheries management was often undervalued and overlooked, because they were not directly involved in fishing. The team therefore implemented multiple gender-based initiatives, including the recruitment and training of six women as Marine Ambassadors, who then went on to promote gender inclusivity, leading education sessions and engaging fellow women in decision-making.

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Though climate change will continue to be a threat to communities throughout Anosy, Project Oratsimba has helped build the capacity, agency, and adaptability of stakeholders to effectively and equitably manage the natural resources on which they depend

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The first election of a woman to a Fisheries Management Committee in Sainte Luce highlighted the communities' positive reception of gender inclusivity, with such initiatives promoting equity and empowering a greater portion of the population to work towards sustainability.

Though climate change will continue to be a threat to communities throughout Anosy, Project Oratsimba has helped build the capacity, agency, and adaptability of stakeholders to effectively and equitably manage the natural resources on which they depend. This strengthened governance, management, and stewardship of the lobster fishery by local communities has contributed both to the socioeconomic resilience of Sainte Luce and Elodrato, and to the long-term sustainability of the lobster fishery, supporting poverty alleviation and biodiversity protection across the region.

Written by Quinn Parker. For more information on project 25-016, led by SEED Madagascar, please click [here](#).



Anguilla fisherman, Credit: Department of Fisheries and Marine Resources

Adapting and building resilience to climate change in Anguilla's and Montserrat's fisheries

Fisherfolk and their livelihoods are increasingly at risk from climate change and related disasters in Caribbean islands like Anguilla and Montserrat. The erosion of beaches, loss of coral reefs and mangroves due to rising sea levels, coral bleaching and shifts in fish populations due to rising ocean temperatures, sargassum influxes, and more intense storms and hurricanes pose a significant challenge. As one Anguillan fisherman, Aristo, lamented, *"We have to go out further and deeper now, the gas [for our boats] is so expensive and fish production is lower in the reefs. So it's really tough."*

Recognising these challenges, the Caribbean Natural Resources Institute (CANARI) worked from 2017 to 2020 to support adaptation to climate change in the fisheries sector in collaboration with the Department of Fisheries and Marine Resources - Anguilla, the Fisheries and Ocean Governance Unit - Montserrat and the University of the West Indies - Centre for Resource Management and Environment Studies (CERMES). An innovative ecosystem approach to fisheries was used to address the multiple risks from climate change, and to conserve key coastal and marine ecosystems and ensure sustainable fisheries and local livelihoods.

Participatory three-dimensional (3D) modelling was used to assess climate change impacts and vulnerabilities from 'ridge to reef' as part of an ecosystem approach. Through a facilitated process, fisherfolk, other coastal and marine resource users and local authorities built physical 3D models of the islands of Anguilla and Montserrat and the surrounding marine areas to document local knowledge on resource use, livelihoods and areas critical to fisheries, including fishing communities, landing sites and fish habitats. The 3D models were used to identify priorities, such as: strengthening fisherfolk's adaptive capacity through safety at sea training, accessing insurance and developing alternative livelihoods; improving systems for monitoring changes; and protecting and restoring coral reefs that support fisheries to address identified threats from coastal erosion, more intense storms and

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An innovative ecosystem approach to fisheries was used to address the multiple risks from climate change, and to conserve key coastal and marine ecosystems and ensure sustainable fisheries and local livelihoods
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Participants input their knowledge on Montserrat 3D model, Credit: CANARI

storm surge and sargassum influxes. The data was also digitised to produce geographic information systems (GIS) databases and maps, which can be integrated with scientific data to support land use and marine planning.

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The fisheries authorities, fisherfolk leaders and other coastal and resource managers were then trained by CANARI and CERMES in applying an ecosystem approach to fisheries and supported to integrate adaptation and disaster management considerations into fisheries management plans

An institutional assessment to determine the community's readiness to adapt, which included interviews and focus groups with various government authorities and fisherfolk leaders, was also undertaken. It revealed a lack of relevant data to inform decisions, weak coordination mechanisms and gaps in the policy and legal framework to support adaptation in the fisheries sector. The fisheries authorities, fisherfolk leaders and other coastal and resource managers were then trained by CANARI and CERMES in applying an ecosystem approach to fisheries and supported to integrate adaptation and disaster management considerations into fisheries management plans. This included updating Anguilla's Small Coastal Pelagics Management Plan and Montserrat's National Fisheries Plan.

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Fisherfolk were trained and supported to create videos to showcase their own perspectives on the local impacts of climate change and their vulnerabilities, and advocate for changes in policy and practice for improved fisheries management

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Based on these assessments, fisherfolk organisations were provided with small grants and mentoring to pilot practical actions to adapt and promote stewardship of coastal and marine ecosystems such as coral reefs and mangroves. In Anguilla, the Anguilla Fisherfolk Association in collaboration with the Anguilla National Trust and fisheries authority helped restore coastal and marine habitats in the Prickly Pear Marine Protected Area by constructing lobster casitas to create a habitat for the Caribbean spiny lobster and create an artificial reef. They also conducted safety at sea training for fishers, given more extreme weather events and rougher seas due to climate change. In Montserrat, the Montserrat Fishers and Boaters Association conducted climate smarting of fish aggregating devices (FADs) and fish traps to make them more resilient and environmentally friendly. They also organised a 'fishers against marine litter' campaign including a beach clean-up. These efforts helped reduce pressure on coastal and marine ecosystems that support nearshore fisheries. Additionally, fisherfolk were trained and supported to create videos to showcase their own perspectives on the local impacts of climate change and their vulnerabilities, and advocate for changes in policy and practice for improved fisheries management.

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CANARI and CERMES will be building on this work in a **new Darwin Plus project** from 2021 to 2024 to address the increasing risks of sargassum influxes to the fisheries and tourism sectors and build coastal resilience in Anguilla, Montserrat and the British Virgin Islands.

Written by Dr. Ainka Granderson and Melanie Andrews. Further information on project DPLUS066, led by CANARI can be found **here** and at **<https://arcg.is/LWOfy>**



Field staff measuring trees for carbon modelling, Timor Leste, Credit: Joanne Millar

Timorese farmers benefit from reforestation and carbon accreditation

Growing up in the central highlands of Timor Leste, Alex Sarmiento loves his community and the beautiful environment around his family villages of Laclubar and Soibada. After returning home from University studies in the Philippines in 2007 he was saddened to see the hills becoming more and more degraded with heavy monsoon rains and droughts. His community were suffering from crop losses, lack of shade and soil erosion.

Alex became inspired to plant trees with local farmers using financial support from Australians in the regional town of Bathurst, New South Wales. Thousands of trees were planted in 2011 and 2012 but with poor survival rates. Paying farmers to plant the trees was unsustainable. A long term solution was needed to tackle climate change impacts and ensure long term income for communities to improve their livelihoods and continue to climate action. The ambitious idea of achieving carbon accreditation for smallholder farmers was hatched even though there was only one successful example in another part of Timor Leste.

In 2017, a Darwin Initiative project came to the rescue! A partnership was formed between Charles Sturt University and Group Training Northern Territory, Australia to provide technical expertise in forest carbon modelling and social research.

As project manager, Alex hosted visits by the technical team, supervised field staff and liaised with the community. During the project's lifetime, farmers grew 200,000 trees in nurseries and reforested 120ha of degraded land. The forests were measured for carbon uptake and qualified for carbon accreditation. It is the first scheme in Timor Leste to be registered with the Plan Vivo Foundation.

“ The project developed a stakeholder management structure for equitable carbon income distribution, and ensured poor, landless households also benefited from growing trees and women's microbusinesses ”

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By focusing on all four vital elements of habitat restoration: plant propagation, invasive plant clearance, compost production, and planting trees back into the wild, we have ensured that the cycle of habitat restoration is maintained and does not slip behind schedule

The project developed a stakeholder management structure for equitable carbon income distribution, and ensured poor, landless households also benefited from growing trees and women’s microbusinesses.

One of the beneficiaries, Fernanda Soares du Terre of Soibada is 54 years old with seven adult children. They own their land, which they inherited through her husband’s father, and on their land they grow mahogany, coffee, and teak. In 2018, they received around \$1,600 in payments from the project for their trees. Fernanda feels positively towards the project due to the financial incentives and believes that the value of her land will increase with the trees. In 30 years, once the trees have matured they will be able to be used for tables, chairs and for building materials.

She says that “The most important thing at the moment is to find money to pay for the children’s education” “When we look after the trees, we can get money from the trees”.

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Local communities are now more aware than before of the benefits of growing trees for household income and biodiversity. This source of income has proved essential for food, clothes, household items and school expenses. The project was a catalyst for further investment in upland reforestation and climate change mitigation policies. Local Timorese partner, Foundation for Carbon Offsets Timor Leste, will continue to scale out community reforestation, provide carbon income for households, facilitate community development including women’s enterprises and participate in climate change policy implementation in Timor Leste. The project demonstrated that smallholder farmers in developing countries can engage with the international carbon market for long-term poverty alleviation.

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The most important thing at the moment is to find money to pay for the children’s education - when we look after the trees, we can get money from the trees

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Written by Joanne Millar and Alex Sarmento. Further information on project 24-025, led by Charles Sturt University can be found [here](#) or at communityreforestationtimorleste.wordpress.com



Setting wildlife traps in Timor Leste, Credit: Alex Sarmento



Measopsis eminii seedlings ready for planting at Kidoma community nursery, Credit: FFI

Community reforestation: Restoring chimpanzee corridors in the Albertine Rift region, Uganda

The challenge for conservation practitioners is how to work in partnership with local communities to achieve effective, long-term nature conservation while at the same time ensuring that local women and men have viable livelihoods that provide a decent standard of living for their families now and in the future. FFI has a long history of working with communities in biodiversity-rich landscapes to enable them to act as effective custodians of their precious, yet threatened, natural resources, empowering delivery of locally-led solutions.

In the Albertine Rift region of Uganda, along the riverine areas of the two corridors of Budongo-Mukihani and Bugoma-Wambabya, which is vital eastern chimpanzee (*Pan troglodytes schweinfurthii*) habitat, FFI has been utilising a community engagement approach to riverine reforestation. The approach, in which community members come together voluntarily to plant indigenous trees, has been embraced by people in the three parishes of Kidoma, Bulyango, and Kasenene. Effectiveness has been enhanced by using a Training of Trainers approach, selecting individuals from the community for training who could then pass on the training more widely within their communities. Schedules were devised, seedlings were collected from the

community-owned tree nursery, and were planted along agreed riverine areas.

Through this community empowerment approach, in just two weeks a total of 27,720 assorted Indigenous tree seedlings (*Cordia diversifolia*, *Khaya anthotheca*, *Measopsis eminii* and *Mitragyna stipulosa*) have already been planted on 61ha in the three communities. There are now plans to enrich the planted area with other species. This collaboration among the communities has contributed to a sense of unity in the pursuit of a common goal. This solidarity has arisen from a shared understanding and appreciation of the need to restore forest corridors to mitigate the effects of climate change and the importance of this in safeguarding livelihoods. This Darwin Initiative project's community engagement has fostered ownership by the community of their forest corridors, which is key to ensuring sustainability of restoration efforts in the Albertine Rift region and securing key habitat corridors for chimpanzees.

This restoration effort safeguards nature for climate stability and human wellbeing, mitigating climate risks through the protection of natural carbon sinks and stores, whilst providing increased resilience for communities facing the effects of climate change.

Written by Kukundakwe Mazimakwo and Rogers Niwamanya. For more information on project 27-017, led by FFI, please click [here](#).



A farmer and his wife weed their soybean garden in the second season following a good first season, Credit: Anthony Ochieng

Human-wildlife conflict mitigation solution?

In the Albertine region, primates, especially chimpanzees, are increasingly coming into direct contact with communities that live around them as they compete for resources like water, shelter and food. Rapid human population growth has led to increased encroachment on forest reserves and other wildlife habitats, leading to increased incidences of often fatal conflict between the wildlife species and the humans, with wildlife almost always paying the price.

As the battle for resources between human and wildlife populations continued, farmers converted more and more forest land into farmland and large corporations created plantations of sugar, tobacco and rice. Due to the increasing anthropogenic pressures, wildlife was squeezed out of their habitats and as a result turned to farmers gardens for food and shelter. Farmers in turn tried to protect and guard their gardens from raids, especially by primates, which often leads to conflict.

“As the battle for resources between human and wildlife populations continued, farmers converted more and more forest land into farmland and large corporations created plantations of sugar, tobacco and rice

The Chimpanzee Trust in Uganda piloted a mitigation strategy through this Darwin Initiative funded project, working with communities living in close proximity to wildlife as well as those that have suffered losses due to crop raids. Over the last three years, the project has sought to provide a possible solution in an effort to protect wildlife and prevent further biodiversity loss.

“The Bugoma Forest Reserve is one of the few remaining intact natural forests that is home to thousands of primates, including over 600 chimpanzees and many other primate species”

This project has worked to establish alternative high-value crop regimes that are less palatable to primates and therefore less likely to be crop raided, focusing in buffer zones of Bugoma Central Forest Reserve in western Uganda. The Bugoma Forest Reserve is one of the few remaining intact natural forests that is home to thousands of primates, including over 600 chimpanzees and many other primate species. Farmers living along the edge of this forest farm maize, rice, peanuts, beans, etc for their food and often suffer losses to damage and ‘harvest’ by primates. The project introduced onion, Irish potato, ginger, soy, mushroom and chilli farming to help reduce human wildlife conflict (HWC) as well as increase awareness on the need to conserve the primate



Christine, from Chimpanzee Trust, teaches about prevention of conflict with wildlife, Credit: Anthony Ochieng

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 The project goals have been achieved with a record of reduced incidences of conflict, increased returns from farming as well as the establishment of vibrant Village Savings groups and associations that are gradually building their resilience fund and have been able to expand to include other farmers into the initial scope of the project

species, particularly chimpanzees, and find ways to live in harmony with wildlife.

During the project a HWC resilience fund was also set up, contributed to by the farmers in Village Savings groups, to be able to compensate themselves for any

loss that may occur. Farmers make monthly contributions to the fund, managed by members who are trained in the management of group financial management by the project.

The groups are legally registered and have continued to recruit more member farmers who face the same problem of conflict around Bugoma Central Forest Reserve.

The project goals have been achieved with a record of reduced incidences of conflict, increased returns from farming as well as the establishment of vibrant Village Savings groups and associations that are gradually building their resilience fund and have been able to expand to include other farmers into the initial scope of the project.

Written by Joshua Rukundo. For more information on project 25-028, led by Chimpanzee Trust, please click [here](#).



Ascension Island spurge *Euphorbia organoides*,
Credit: Jolene Sim and Megan Benjamin

Improving climate resilience on Ascension Island

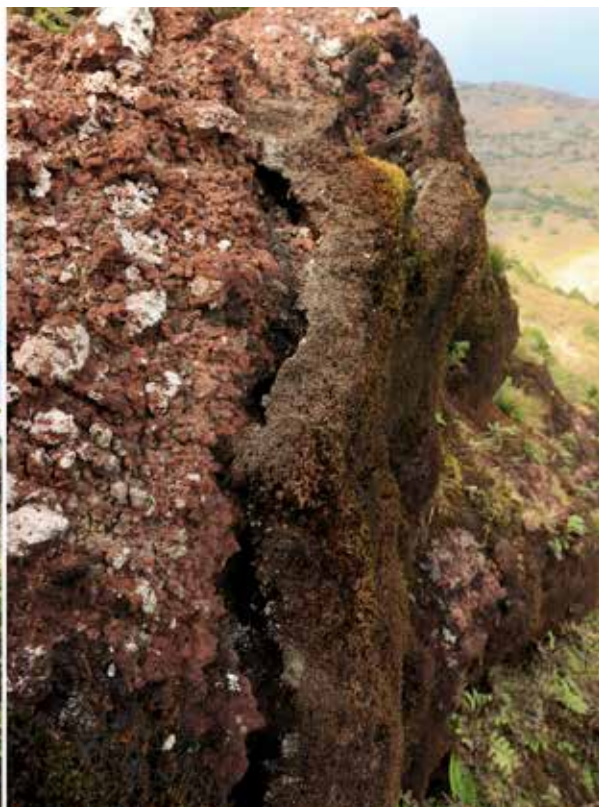
Ascension is a small, remote island in the South Atlantic Ocean whose environment has been radically changed by the introduction of numerous non-native species. Regular fog immersion on its highest peak, Green Mountain, creates a verdant ecosystem very different to the arid lowlands. However, the mountain is currently drier than many local residents have seen in their lifetimes. Long-term predictions suggest that conditions suitable for cloud zone ecosystems to thrive could shift dramatically as a result of climate change, with the cloud base rising by hundreds of metres in tropical montane situations worldwide. Reaching only 860m, such impacts would be catastrophic to Green Mountain and a major risk to the six endemic vascular plants dependent on regular humidity.

Green Mountain's vertical banks are home to a rich community of native bryophytes and dwarf vascular plants that are particularly vulnerable. Much of the habitat has already been lost to invasive species, and high quality areas are now restricted to a few windward ridges. The few remaining banks have deteriorated further during the drought. Large areas of bryophyte sward have cracked or peeled away, with non-native herbs colonising the newly-exposed areas. This reduction in habitat quality has heavily impacted two Critically Endangered endemics: monitoring data show that since 2009, hedgehog grass (*Sporobolus caespitosus*) has declined by 42% and moss fern (*Stenogrammitis ascensionensis*) by 73%.

The Ascension Island Government Conservation and Fisheries Directorate has responsibility for the island's threatened flora. Our first priority is to arrest these declines and ensure the species immediate survival. However, it is also important to explore ways of mitigating for reduced cloud immersion in the future. Funding from Darwin Plus for this project is therefore being used to build fog catchers above a key site on Windy Ridge. Captured water will be fed into storage tanks, from which an automated system will provide supplementary irrigation throughout the year. The project then aims to recreate native communities that are resilient to invasion and climate change, by restoring bryophyte swards and trialling the planting of native ferns for ground cover around banks, as natural mist interceptors and a barrier to weeds.

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Bryophyte-rich community in 2009 (left) vs the same location again in 2021 (right), Credit: Phil Lambdon

On bare volcanic soils nearer the coast, another endemic, the Ascension spurge (*Euphorbia organoides*), has receded to fragmented populations at the island's hottest and driest extremes, having been pushed from much of its historical range by pests, grazing and competition from invasive vegetation. Its habitat and life history further put it at high potential risk from climate change. It is suspected that levels of soil moisture at the current refuges are marginal for sustaining growth, and persistence seems to require periodic flood events, which trigger mass germination from the seed bank.

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By 2019, the population had declined to approximately 10% of its long-term average and, although there was some recovery after a wet spell in 2020, this appears to have been short-lived following a return to drought

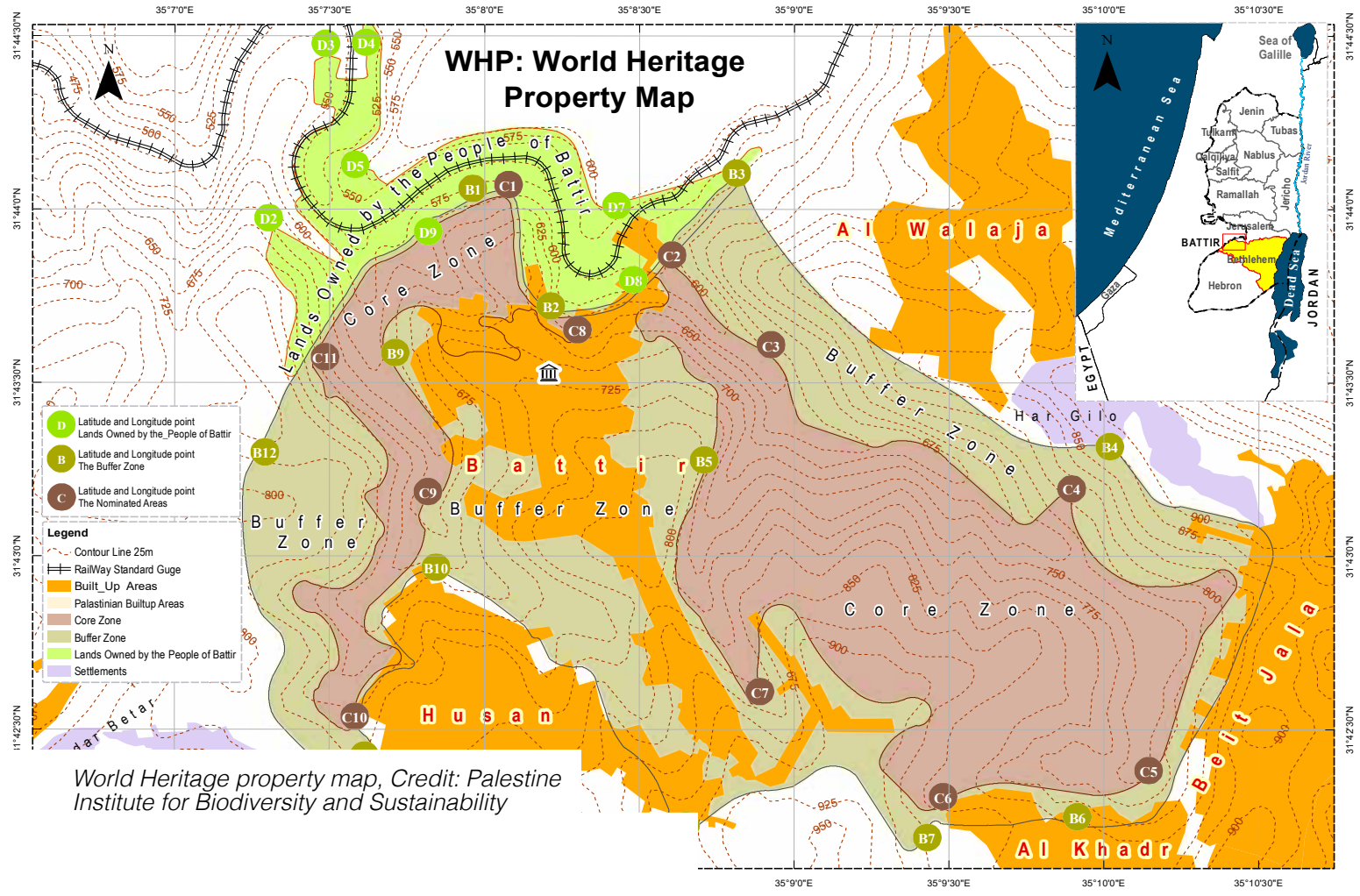
By 2019, the population had declined to approximately 10% of its long-term average and, although there was some recovery after a wet spell in 2020, this appears to have been short-lived following a return to drought. Through our project, we are monitoring soil moisture dynamics at selected sites around the island, and the French Institute for Agricultural Research (INRA) will study how this impacts drought tolerance.

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These data will allow us to determine where the species may grow best on the island under predicted climate change scenarios - plants from the nursery population will then be introduced to suitable 'future-proofed' sites to assist the species' migration

These data will allow us to determine where the species may grow best on the island under predicted climate change scenarios. Plants from the nursery population will then be introduced to suitable 'future-proofed' sites to assist the species' migration.

Darwin Plus is also funding the creation of a climate model for Ascension through the University of East Anglia, which will enable us to quantify the threat posed by climate change. Overall, the project will identify effective management options to conserve its endemic flora in the future.

Written by James McGurk and Phil Lambdon. For more information on project DPLUS113, led by Ascension Island Government, please click [here](#).



Sustainable impact of project in a world heritage site

Our project funded by Darwin Initiative has recently come to an end, but during its lifetime it achieved significant impact in areas of sustainability and adaptation to rapidly changing environmental circumstances. The project area, the Al-Makhrour Valley, is the last remaining biodiversity-rich area in Bethlehem district, Palestine. It is rich in cultural and natural heritage and was designated a UNESCO World Heritage Site. The challenges to biodiversity include harmful agricultural practices, lack of awareness of local people, construction of settlements, urbanisation, climate change, habitat loss, and land fragmentation. Poverty in the area is impacted by the occupation, abandonment of agriculture, and poor planning of productive and sustainable practices (such as ecotourism). A management plan for the valley, based on scientific studies and community involvement, was adopted by the local and national authorities, the project playing a major part in its adoption.

Four marginalised communities were the main beneficiaries of the project. By working with almost 100 farmers in the communities, the project was able to promote more biodiversity friendly agricultural practices. In addition, women's cooperatives and opportunities for

“ The challenges to biodiversity include harmful agricultural practices, lack of awareness of local people, construction of settlements, urbanisation, climate change, habitat loss, and land fragmentation. Poverty in the area is impacted by the occupation, abandonment of agriculture, and poor planning of productive and sustainable practices (such as ecotourism)

ecotourism were established to enhance both the local economy and biodiversity through empowering the local communities (you can find out further information on the ecotourism opportunities [here](#)). Research including over a dozen publications and developed databases relating to fauna, flora, habitats and threats, training (capacity building) for locals and others, all contributed to the project's success. The development of more than ten educational modules and land restoration helped



Battir Village in Palestine, Credit: Palestine Institute for Biodiversity and Sustainability

mitigate some of the threats noted. However, much to our surprise, some significant and unforeseen achievements were accomplished.

These included:

- 1) Influencing government agencies like agriculture, tourism, and environmental quality authority in areas of biodiversity conservation and human development as this project became a model to study nearby and other areas.
- 2) University courses were built around the project area. For example, a Masters level course on research methodologies used the area as test cases and for course projects. Two female students finished Masters degrees whose research related to the area of this project. Further, many international students did internships here and benefitted from this knowledge, including two whose theses related to this project.
 - a) María Cáceres Sánchez: **The Exploitation of Natural Resources In Area C of The West Bank**
 - b) Julius Pahl: **Development of a concept of measures for endangered orchid species in selected areas of the West Bank, Palestine**

- 3) The project was seamlessly integrated with previous related projects (e.g. from the National Geographic Society) and latter projects (like a project funded by EU on human and biological diversity), and was extended to a study of a nearby valley of Cremisan for an eco-corridor.
- 4) Further unexpected lessons learned was that researchers must become proactive in defending the areas they research. For example, we wrote a letter to UNESCO when we noted damage to the rich biodiversity area here and we actually got a **response from UNESCO**

The project lessons noted above are also being incorporated in developing the nascent State of Palestine's National Biodiversity Strategy and Action Plans. We believe such projects are critical to work nationally and locally for human and nature sustainability in a challenging era.

Written by Mazin Qumsiyeh. For more information on project 25-030, led by Bethlehem University, please click [here](http://almakhrour.palestinenature.org) or at <http://almakhrour.palestinenature.org>.



Women's participation in monthly meeting, Nepal, Credit: ZSL

Sustainable livelihoods for climate change adaptation: Ghodaghodi lake area

Ghodaghodi Lake Area (GLA) is a designated Ramsar site of ecological importance, comprising 24 smaller wetlands, forest patches, grasslands, shrublands, settlements and agricultural areas. Nestled in the lap of the Churia hill range, the area is rich in biodiversity, containing 319 species of birds, 29 species of mammals (including threatened species such as leopards, smooth-coated otters, and Indian pangolins), 30 species of fish, seven species of reptiles (including mugger crocodile) and a large number of different plant species. The network of wetlands and surrounding forests in this area are playing an important role in buffering the effects of climate change reducing flood risks and other climatic hazards.

However, this important site remains highly vulnerable to the impacts of climate change owing to changing monsoon patterns and increasing temperatures, and these impacts can be seen in pronounced droughts, damaging flooding, and changes to ground and underground water levels. Illegal sand and gravel mining and the over-extraction of natural resources – including water in Churia and the Terai region of Nepal – have further exacerbated the deterioration of this watershed, putting the livelihoods of the local communities at risk, especially those who are highly dependent on watershed resources and subsistence agriculture.

Sustainable livelihoods mechanisms are crucial to mitigate these worsening impacts of climate change as well as to build the resilience of GLA, on which so many forest and wetland-dependent communities rely. ZSL Nepal's Darwin Initiative project "*Ghodaghodi's Guardians: Communities Restoring a Ramsar wetland at watershed scale*" is working alongside indigenous Tharu communities of GLA to achieve a holistic management of the watershed, including its conservation, sustainable resource use and livelihood improvements for its people.

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In the past few years, the project conducted a Natural Capital Assessment through both community participation and field monitoring, which helped ZSL to understand local communities' (from both downstream and upstream catchments) dependence on the natural capital of GLA and its identified ecosystem services,

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existing environmental pressures, and sustainable management of GLA. Regular collaboration with stakeholders, including indigenous and marginalised communities, helped to build a consensus for riparian forest management and fisheries interventions primarily to protect and manage wetlands, surrounding forests and other natural resources for conservation benefits which in turn limits the contributing factors to climate change and increase local climate resilience.

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Alongside this, a range of sustainable livelihood activities were conducted to diversify income generation and ensure livelihoods are more sustainable and resilient to shocks, such as climate change, in the critical GLA. Nearly 200 local fishers were provided with training in sustainable fishing and management of fishponds to reduce over-exploitation of GLA's biodiversity. Other sustainable management interventions included the promotion of ecotourism and regulating grazing and pesticide/fertiliser application. As communities are especially committed to conserving the natural and cultural diversity of GLA, they have readily taken ownership of the project – boding well for its long-lasting impact and legacy.

Community members and Ghodaghodi Municipality have come together to declare GLA a Bird Sanctuary, which will increase positive momentum for the conservation of GLA, spreading conservation awareness throughout the region and country. More importantly, the project collaborated with Ghodaghodi Municipality to prepare a comprehensive master plan for GLA's sustainable management. All these activities will help to address the current and projected impact of climate change on GLA.



Project site at the Ghodaghodi Lake, Kailai district, Nepal, Credit: ZSL



Women participate in alternative livelihood training, Credit: ZSL

Studies show that the changing climate will increasingly threaten the area by altering water sources and tables, thereby impacting aquatic species and subsequently terrestrial species*.

Changes in the water flow and increased drought and flooding will pose additional threats to the livelihoods of the Tharu people, who are dependent on agriculture and fishing. The project's activities have been helping to improve the livelihoods of indigenous Tharu people and

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encouraging them to keep their lakes and surrounding areas intact, minimize stress on water resources, reduces the overexploitation of natural resources, secure the breeding sites of aquatic animals and allow species to move towards favourable environment in response to climate change.

With communities and stakeholders coming together for restoration and wise-use of wetlands, forest resources management and sustainable livelihoods and economic activities, the prospects are good for sustainable GLA management over the longer term, which is essential for mitigation and adaptation against the future impacts of climate change.

**Rather et al. 2020 “Multi-scale habitat modelling and predicting change in the distribution of tiger and leopard using random forest algorithm” discusses tiger movement in response to climate change) and Rowe et al. 2015 “Spatially heterogeneous impact of climate change on small mammals of montane California” discusses range shifts of small mammals attributed to global warming.*

Written by Prakash Sigdel and Anuska Joshi. For more information on project 26-012, led by ZSL Nepal, please click [here](#).



Packaged honey produced by the Tana Delta Conservation Network, Credit: George Odera

Tana Delta Green Heart Initiative to spur economic growth, promote conservation efforts and contribute to climate change mitigation and adaptation

The Tana Delta is located in the coastal region of Kenya at the end of Kenya's longest and largest river, the Tana River. Approximately 90% of the Delta lies in Tana River County and about 10% lies in Lamu County. The Delta is an Important Bird Area, a Ramsar Site, a Key Biodiversity Area (KBA), a Global Biodiversity Hotspot, and part of the Coastal Forests of Eastern Africa Hotspot. The Delta provides valuable natural resources such as rich soils, vegetation, and wildlife. The aim of the project is to create an Indigenous and Community Conserved area (95,000ha), within the middle of the Delta which is around 130,000ha and home to 120,000 people.

Nature Kenya has worked with Tana Delta communities since 2007, firstly mounting a national and international campaign against more than seven land-grabbing projects. Subsequently, Nature Kenya successfully encouraged and facilitated national and county governments to formulate a community-led Land Use Plan (LUP) informed by a Strategic Environmental Assessment (SEA). During the development of the LUP, a lot of data on the Delta was gathered by Nature Kenya and partners. Nature Kenya has conducted numerous surveys in the Delta since 2012, including over 100 villages, consulting men and women, youth, heads of households, and village and area leaders and elders. Their views, aspirations, plight, and suggested

solutions informed all the surveys and consultations that culminated to the highly consultative LUP.

The project, led by RSPB, was designed to demonstrate how the LUP could be implemented in the heart of the Delta, where biodiversity is richest and access to water and land is hotly contested. The Darwin Initiative supported the implementation of the Tana River Delta Land Use Plan, a framework that guides the management of land and natural resources at the Delta. The plan incorporates the adaptation of climate-smart agriculture by farmers and pastoralists which is key in improving livelihoods, building resilience to climate change, and conserving the 130,000ha Delta. The project design was aligned to respond to biodiversity conservation provisions of The Wildlife Conservation and Management Act (that allows for development of wildlife conservancies) and the Forest Conservation and Management law (that provides for community forests) offering a framework for Indigenous Community Conserved Areas (ICCAs).

Nature Kenya also explored sustainable financing options through the Tana Delta Green Heart Initiative, alongside a plan-vivo approach to generate carbon credits to enhance livelihoods and nature values within the Delta. Although the Darwin project has recently come to an end, the Green Heart Initiative is the future hope for climate smart solutions that generate jobs, improve livelihoods and conserve biodiversity. The Tana Delta Green Heart Initiative's vision is designed to deliver the preferred strategy set out in the Tana River Delta Land Use Plan (2014). The initiative seeks to transform the lives of people living within and around the Tana



One of the local farmers engaged in climate-smart agriculture at the Tana River Delta, Credit: George Odera

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Maintaining spaces for biodiversity alongside development will be beneficial, as these ecosystems will provide a range of benefits to humans. Tana Delta Green Heart Initiative will work towards achieving this

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**- Paul Matiku, Executive Director
Nature Kenya**

River Delta by promoting sustainable economic growth and protection of the environment, creating new jobs and livelihoods, and boosting the regional and national economy.

“Maintaining spaces for biodiversity alongside development will be beneficial, as these ecosystems will provide a range of benefits to humans. Tana Delta Green Heart Initiative will work towards achieving this,” says Dr Paul Matiku, Executive Director, Nature Kenya.

A Green Heartland, covering the entire Delta, will be established to include farms where production services in

the area will be based on green development principles. In the model, outgrowers will practice environmentally friendly means to boost production of fish, livestock meat, milk, vegetables, rice, fruits, honey, and prawns among others. It will also include conservancies where tourists will enjoy scenery and wildlife and river boat rides as well as industrial estates where private companies, including local entrepreneurs, will set up their manufacturing, processing, collection and packaging bases. Public funds will be made available to assist in the creation of basic infrastructure, including roads, electricity, and water and sanitation facilities. Warehouses for storage will be constructed by private investors.

The European Union, through the Community Resilience Building in Livelihood and Disaster Risk Management (REBUILD) project, and the Global Environment Facility (GEF), through the Restoration Initiative project, are supporting components to set the foundation and catalyse actions in line with the objectives of the initiative. Nature Kenya, working with the Tana River County government, is scouting for potential investors and partners to ensure that the initiative's goal is realised. There are plans to develop a follow-on Darwin project to ensure that the dream unearthed by the project 24-013 is made into a reality.

Written by John Kiptum. For more information on project 24-013, led by RSPB, please click [here](#).



Participants in the participatory 3D modelling workshop in Montserrat, Credit: Government of Montserrat

Newsletter Contacts

The Darwin Initiative Secretariat (Defra)

The Darwin Secretariat is based in Defra and includes Doug Gibbs, Saskia Boardman, Ben Yexley, Andrea Hodgson and Chelsea Goodwin.

For any queries on project applications or existing projects please contact our Darwin Administrators (NIRAS-LTS International) at

darwin-applications@ltsi.co.uk
or **darwin-projects@ltsi.co.uk**

This newsletter is produced quarterly. To include an article on your project please contact us at

darwin-newsletter@ltsi.co.uk

Funded by the UK Government, The Darwin Initiative provides grants to support developing countries to conserve biodiversity and reduce poverty, with Darwin Plus focusing its grants on the natural environment and climate change in the UK Overseas Territories. Since 1992, the Darwin Initiative and Darwin Plus have committed over £198 million to 1,319 projects in 159 countries.