Newsletter

December 2020

Members from Our Sea Our Life bivalve aquaculture groups testing preservation methods in Mecufi, Credit: Jeremy Huet

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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)

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A wild relative of coffee, Coffea macrocarpa*, Credit: Mukesh Rhugoo*

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Harvesters of the broom grass carrying their harvest off Mount Mulanje, Credit: Alex Hudson

Publicity and information about the Darwin Initiative

For more information on the Darwin Initiative please visit **gov.uk/government/groups/the-darwin-initiative**

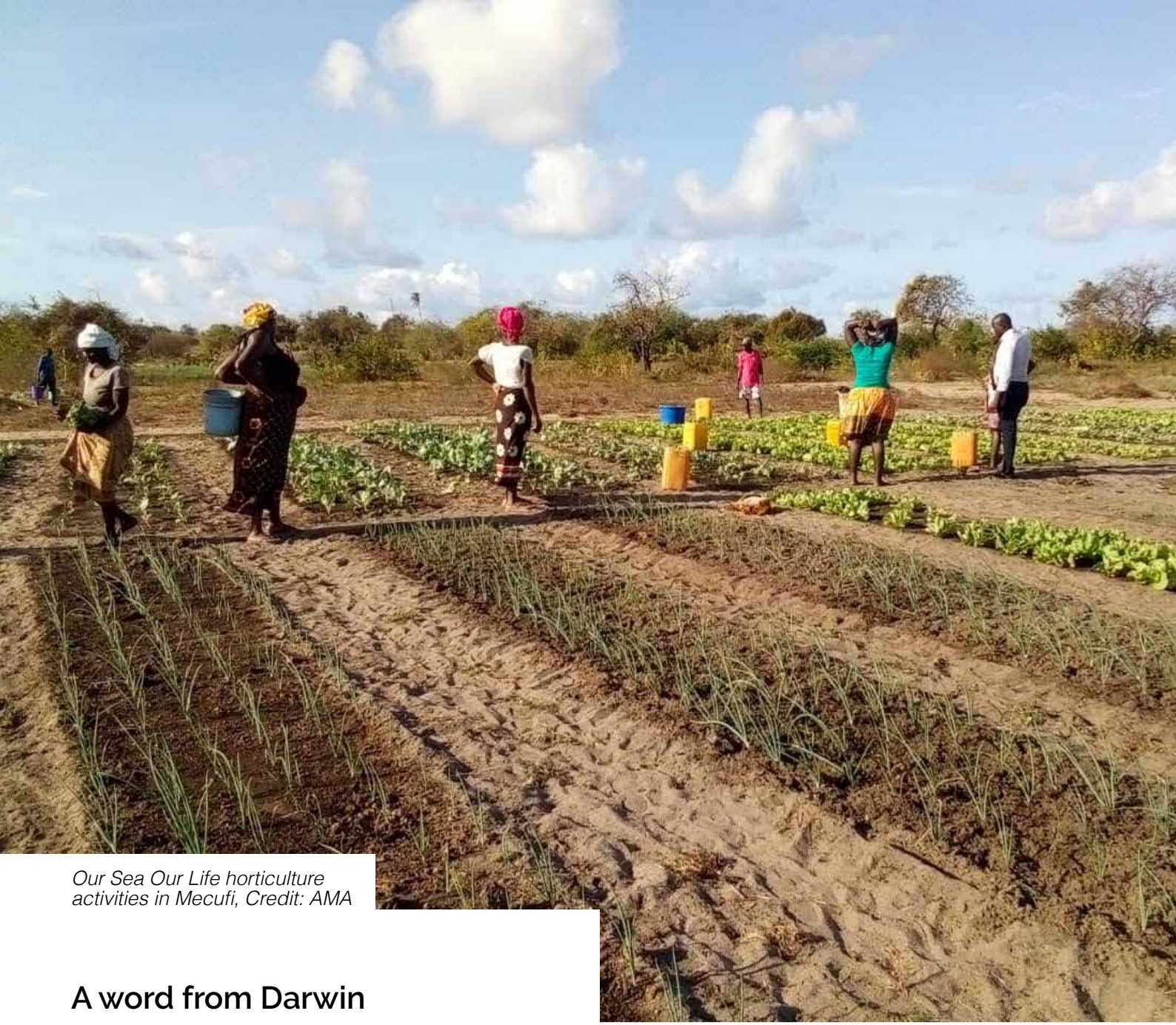
For further details about current and completed Darwin Initiative projects, including their final application forms, please visit **darwininitiative.org.uk**

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.



Our Sea Our Life horticulture activities in Mecufi, Credit: AMA

A word from Darwin

Access to nutrition and water are basic human rights. Despite this, according to the latest statistics published by the **United Nations** an estimated 700 million people went hungry in 2019, with an additional 130 million more suffering from food insecurity exacerbated by the global pandemic this year. As we enter the final month of 2020, which for many is celebrated with an abundance of food to bring in the new year, in this edition of the newsletter we wanted to highlight the issue of food security and its intrinsic links to biodiversity and sustainable livelihoods.

In our December edition "Hungry for Biodiversity" we hear from a range of projects across the globe, from preserving traditional agricultural knowledge in the Moroccan High Atlas mountains to alleviate poverty in Paraguay through encouraging communities to live more sustainably.

This holiday season we celebrate projects that are providing local people with the skills, opportunities and knowledge to empower and enable communities to expand their livelihoods, tackle hunger and honour cultural and traditional knowledge whilst simultaneously protecting and promoting biodiversity.

Happy holidays from the Darwin Initiative team and we hope you enjoy this edition of the newsletter!

Meeting with hunters in Malen, Credit: Donald Mboheli

People need to eat

There was a time not too long ago when the paradigm for managing protected areas was just that - protection, protection, protection. Local people were regarded as a threat to wildlife conservation and treated as such, often being evicted from areas that they believe belonged to them, where they had lived for many years. Inside and around what is now the Dja Faunal Reserve in Cameroon, people have historically hunted for food and used the surrounding rivers to fish. However, since the creation of the Reserve and the ban on hunting, many local people are now struggling to obtain enough protein to meet their needs.

The introduction of community hunting zones (CHZ) may help address the challenges - under Darwin project 20-007 the partners helped to establish a well managed CHZ on the edge of the Dja Faunal Reserve, which enables local people to hunt a set quota of non-threatened species. Under the latest project (24-005), local people living in the buffer zone of the Dja Faunal Reserve are given support to manage the fish stocks and preserve their catch over longer periods, ultimately discouraging hunting and helping to relieve stress on threatened species.

In both projects, the sustainability of natural resources is key. The quota system in the CHZ ensures that over-hunting is minimised, and that threatened species are protected. In the buffer zone communities, through reciprocal environmental agreements, direct benefits such as provision of fishing equipment and the development of cash crops such as cocoa help ensure that the biodiversity in the Reserve is given extra protection.

> “In the buffer zone communities, through reciprocal environmental agreements, direct benefits such as provision of fishing equipment and the development of cash crops such as cocoa help ensure that the biodiversity in the Reserve is given extra protection”

The crucial element that helps sustainability is empowering local people to make decisions about the activities they want to undertake, rather than communities having activities imposed upon them by 'outsiders'. In the area around the north east borders of the Dja Faunal Reserve there was enough space to create a CHZ. Working sessions involving local people, the partners and government officials enabled the communities to set up their own CHZ under Cameroonian law. In northern buffer zone communities, the local people elected to focus on increasing their fish catch, in an effort to provide extra food security.

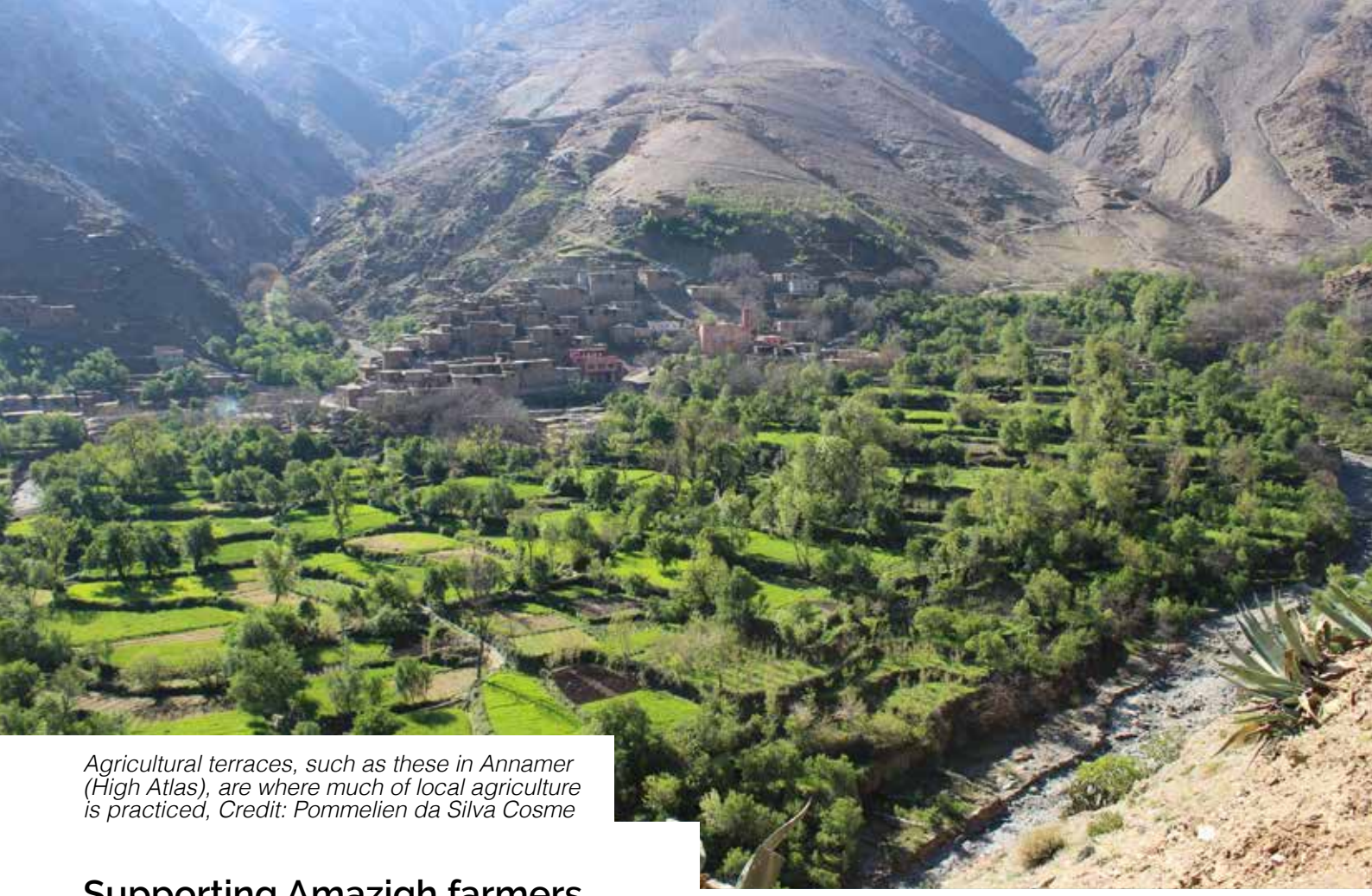
In both of these Darwin projects, local people are not the problem to conserving biodiversity - they are the solution.

> "In both of these Darwin projects, local people are not the problem to conserving biodiversity - they are the solution"

Helping them to devise and undertake alternatives to illegal, unsustainable hunting has resulted in new, sustainable ways for people living in challenging circumstances to obtain the food they need to survive, and improve their lives.

Further information on project **20-007** and **24-005** can be found using the links.

Community members with additional fishing material, Credit: Donald Mboheli



Agricultural terraces, such as these in Annamer (High Atlas), are where much of local agriculture is practiced, Credit: Pommelien da Silva Cosme

Supporting Amazigh farmers for the conservation of local agrobiodiversity in the Moroccan High Atlas

The iconic cultural landscapes in the Moroccan High Atlas harbour significant biological and cultural diversity. In recent years, we observed the erosion of traditional agricultural knowledge, adaptive local practices and plant genetic resources through our work with Amazigh communities. In 2013, we launched our High Atlas Cultural Landscapes programme to support their efforts to maintain and restore traditional practices, enhance livelihoods and sustainably manage lands and resources. Since the beginning, this programme has benefited from funding from the Darwin Initiative, including our current project that supports local Amazigh farmers to improve agricultural productivity and food security.

We launched our Farmer Field Schools programme in 2019, which provides in-the-field training for Amazigh farmers to enhance their knowledge of innovative organic pest, soil and water management techniques and methods to improve productivity and enhance local biodiversity, while maintaining their traditional practices. The first one, which focused on soil health and fertility, increased their understanding of soil conservation practices and techniques that are beneficial for the environment.

> “I learned how to prepare an organic liquid fertilizer with alfalfa. Despite the fact that alfalfa grows abundantly here in Annamer, I’ve never used it to fertilise my plots”

“I learned techniques that are all new to me,” said Aziz Ait Ouakrim, a local farmer from Annamer after the two-day farmer field school. “I learned how to prepare an organic liquid fertilizer with alfalfa (*Medicago sativa*). Despite the fact that alfalfa grows abundantly here in Annamer, I’ve never used it to fertilise my plots,” he adds. Together with Aziz and other farmers, we also addressed the use of animal manure to increase soil quality. Our team learned that local farmers in Annamer don’t prepare or use mature compost to fertilise the soil, but often use animal manure directly, while it’s still fresh. This practice could potentially harm crop production, increase the amounts of weeds and attract pests. Our team demonstrated techniques to compost mature animal manure and other organic materials that are available around their plots such as dead tree leaves.

Through these trainings, we activate local networks for ongoing mutual learning and exchange and

identify opportunities for community cooperatives to improve the commercialisation of their products. In collaboration with local agroecology initiatives, we support rural producers and entrepreneurs to engage with urban customers and market their locally-selected and climate resilient crop varieties to urban-based boutiques, restaurants and guesthouses that value High Atlas agrobiodiversity. The emergent networks within the urban gastronomic scene provide important opportunities for rural entrepreneurs to valorise their unique High Atlas food products, while boosting rural incomes.

> “The emergent networks within the urban gastronomic scene provide important opportunities for rural entrepreneurs to valorise their unique High Atlas food products, while boosting rural incomes”

In addition, we carried out research on the characteristics and availability of local seed varieties and traditional crops and cereals to support farmers to make informed decisions about crop diversity and the management of their agricultural plots.

> “These legumes and cereals are increasingly threatened by agricultural intensification, land abandonment and rural exodus, despite their direct and indirect economic importance and role in traditional cuisine”

We identified five locally important, genetically diverse crops included in the Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA): alfalfa, fava bean, pea, barley and durum wheat. Unfortunately, these legumes and cereals are increasingly threatened by agricultural intensification, land abandonment and rural exodus, despite their direct and indirect economic importance and role in traditional cuisine. Through our Darwin-funded project "Conserving High Atlas agrobiodiversity to improve Amazigh livelihoods in Morocco", we promote sustainable cultivation of these promising crop varieties to support their conservation, strengthen food security and improve community well-being.

Further information on project 27-001, can be found **here**.

Discussion with Amazigh farmers to identify their needs for Farmer Field Schools, Credit: Rachid Ait Babahmad

Mchadijvari community showcasing produce made from wild collected fruits and nuts, Credit: A. Faruk

Fruit, nuts, culture and conservation

Located at a crossroads between Europe, Central Asia and the Middle East, the Caucasus is a truly unique place both botanically and culturally. The region is home to around 6,500 plant species, 25% of which are not found anywhere else in the world. 2,000 of those species have a direct economic value to local communities and 15% are wild-growing fruit and nuts.

Globally, Georgia is the fifth largest exporter of hazelnuts, while grape-wine is seen as Georgia's national pride. Similarly, in Armenia, fresh and processed berries, fruits and nuts hold an important place in drink making (like brandy), local cuisine and traditional medicines. As the demand for fresh and processed fruits and nuts grows, in both local and international markets, the pressure on wild populations also grows. These pressures are compounded by overarching threats to biodiversity in the region, mainly habitat degradation through unsustainable harvesting, pollution and overgrazing by livestock.

In 2018 long-term partners of the Millennium Seed Bank Partnership (Institute of Botany Georgia, National Botanic Gardens Georgia and Nature Heritage NGO in Armenia) set out a multi-pronged approach to tackle these issues in two communities in Georgia and Armenia. The approach places community involvement at the heart of its activities and consists of ex situ (seed banking) and in situ (gardening initiative) conservation, scientific research, and IUCN Red List Assessments.

The project surveyed members of the Mchadijvari community in Georgia to help gain an understanding of the importance of the species being harvested and also highlight other species that may be important for future use. Partners have now made ex situ seed collections of blackberries (the community's most valued crop), dogwood, rosehip, hawthorn, pear, sumac, pistachios, raspberry and more, including the many wild relatives of domesticated crops native to Georgia. The collections are currently stored in long-term conservation in the seed bank at the National Botanical Garden of Georgia and a duplicate collection sent to the Millennium Seed Bank for added security. The collections include *Corylus colchica*, a species of hazelnut not currently in cultivation, but prized locally for its small edible fruits. Like many of the species collected as part of the project *C. colchica* is endemic to the Caucasus (occurs nowhere else) and is considered threatened according to the IUCN Red List.

> "As the demand for fresh and processed fruits and nuts grows, in both local and international markets, the pressure on wild populations also grows"

Khachik community establishing plot from wild harvested fruits and nuts, Credit: A.Papikyan, Nature Heritage

> After surveying the Mchadijvari community, the project gained insightful information on the nutritional and medicinal uses of numerous wild harvested materials. This information on traditional uses is just as valuable as the seeds themselves, particularly for future generations

After surveying the Mchadijvari community, the project gained insightful information on the nutritional and medicinal uses of numerous wild harvested materials. This information on traditional uses is just as valuable as the seeds themselves, particularly for future generations. Through engaging the community in project activities from the very beginning, the project was able to highlight the importance of conserving endemic species, thereby giving them the best chance of survival and encourage sustainable use by future generations. Seeds stored ex situ will minimise extinction risk and serve as a valuable resource for restoration and research activities. These species may contain key genetic traits to help adapt modern domesticated crops to future environments and protect them from pests and diseases, thereby contributing towards future food security both regionally and globally.

In Armenia, partners worked closely with the Khachik community, who expressed concerns about unregulated harvesting of produce in their community. However, the demand for wild harvested produce extends far beyond this community – exacerbating ecosystem disturbance.

> Pressures are compounded by overarching threats to biodiversity in the region, mainly habitat degradation through unsustainable harvesting, pollution and overgrazing by livestock

In response to these threats, partners have worked with community members to establish plots of commonly harvested plants. The hope is that this will relieve harvesting pressure on wild populations and maintain genetic continuity in wild populations. It includes *Pyrus sosnovskyi*, an endangered pear endemic to Armenia and *Rosa hemisphaerica* which is considered as Near Threatened. Setting up the Steering Group Committee has encouraged sharing of valuable information within the community on the use of wild harvested material, once again, recording traditional use and techniques before it is lost.

The project has been well received by these communities and demonstrates the importance of engaging local people in an effort to tackle the challenges of food security and plant conservation. Partners acknowledge that wild harvesting will continue to be an important livelihood for the community, but through embedding conservation concerns and providing advice on sustainable harvesting, we will empower local people to protect their biodiversity whilst simultaneously enhancing local livelihoods and preserving traditional knowledge.

For more information on project 25-017, please click **here**.

Female farmers in the village of Irié using mulch to maintain soil moisture, Credit: Abass Camara

Conserving critical forest biodiversity in Guinea through sustainable agricultural livelihoods

The Ziama Man and Biosphere (MAB) Reserve is one of Guinea's last remaining tracts of Upper Guinean rainforest. It is home to some of the last forest elephants in Guinea, as well as other red-listed species including the Western chimpanzee, pangolin and pygmy hippopotamus. In the Ziama region, growing food insecurity and the lasting impact of the 2014 Ebola epidemic have increased pressure on already poor and isolated farming households. These hardships have been exacerbated by movement restrictions related to the Covid-19 pandemic, as well as recent political upheaval. Since 2017, Fauna & Flora International (FFI) has been working with the Forestry Centre of N'Zérékoré (CFZ) to achieve its goal of decreasing human forest presence inside the protected zones of the Ziama MAB Reserve.

The presence of farmers in the protected wetlands is not only ecologically destructive, but poses a risk of disease emergence (**Gibb et al., 2020**). However, while decreasing human forest presence in the protected zones of Ziama MAB Reserve is of critical importance, so is safeguarding the rights and livelihoods of the farmers currently reliant upon these wetlands.

> "Many of the farmers cultivating in the protected wetlands do so because they lack access to alternatives; some are functionally landless, and the vast majority are land-restricted"

Many of the farmers cultivating in the protected wetlands do so because they lack access to alternatives; some are functionally landless, and the vast majority are land-restricted. The majority of landless and land-restricted farmers in Ziama are women.

FFI and local partner the Association for Community and Agro-Pastoral Development (ADCAP) have been providing regular agricultural trainings to Ziama communities on topics such as compost production and use, quality seed selection, irrigation and the use of cover crops and nitrogen fixing plants for soil regeneration. The transition from rice cultivation in the protected wetlands of Ziama to livelihoods activities outside of the forest, however, is an individualised process that depends not only upon adherence to sustainable agricultural practices, but also upon farmer interest and land availability in the farmer's home village.

Farmer from Avilissou and the Mayor of Sérédou sign a transition agreement, Credit: Abass Camara

FFI, CFZ and ADCAP have been working together with local authorities to define a system that allows farmers to safely and securely volunteer to transition their livelihoods to income-generating activities outside of the Reserve. This process is voluntary at every step, and has been defined in collaboration with Ziama communities.

“To date, the most commonly requested livelihood alternative for farmers who have transitioned out of the protected wetlands is the establishment of improved (Tenera) oil palm seedling nurseries, with improved coffee also a popular choice”

To date, the most commonly requested livelihood alternative for farmers who have transitioned out of the protected wetlands is the establishment of improved (Tenera) oil palm seedling nurseries, with improved coffee also a popular choice. Ginger production is popular for those who have some access to marginal lands, and palm oil extraction and soap-making are options that have been selected by those who cannot access additional land.

This system has already supported 88 farmers to leave the protected wetlands they had been cultivating, with approximately 140 more farmers in the process of transitioning. At the end of this Darwin project, we expect approximately 230 farmers to have transitioned, which will allow for the recovery of over 275 hectares of critical wetlands, as well as improved security for 230 households, or approximately 1,600 people.

For more information on project 24-004, please click **here**.

Women fishers gleaning bivalves, Credit: Ana Pinto

Safeguarding marine biodiversity and food security through community-based action in Mozambique

Coastal communities in the province of Cabo Delgado are among the poorest in Mozambique and are highly dependent on marine resources. The diverse marine habitats in Cabo Delgado have historically been some of the least exploited in East Africa, however fish stocks are becoming increasingly depleted. Growing pressures including local population growth, coastal migration, conflict and threats from gas and oil exploration, are further driving food insecurity and poverty in these communities. Fisheries are one of the main sources of livelihood in Cabo Delgado, having some of the highest numbers of artisanal fishers and fishing centres in the country. Fish are vital for food and nutritional security, through direct consumption as well as indirectly, as a source of income to buy other food items.

The Our Sea Our Life (**OSOL**) programme has developed and piloted a pro-poor model for Locally Managed Marine Areas (LMMAs) in northern Mozambique, that aims to tackle the fundamental drivers of poverty and food security amongst fishing communities.

LMMAs are areas managed by local communities to improve fisheries and conserve marine biodiversity. While community-led marine management is not new in Mozambique or the Western Indian Ocean region, the interconnection of three critical elements to successful marine co-management make the OSOL approach unique and innovative: the LMMAs; local governance and management mechanisms; and sustainable livelihoods and financing. OSOL's participatory approach empowers communities to deliver objectives they help to set.

It brings together these established platforms, for equitable and inclusive governance of resources, while generating alternative income and strengthening and securing food and nutritional security.

> "Growing pressures including local population growth, coastal migration, conflict and threats from gas and oil exploration, are further driving food insecurity and poverty in these communities"

One of the main outputs from phase 1 of the OSOL programme was to develop a best practice guide based on experiences and lessons learnt from the model, drawing on the valuable experience of each of the partners in the consortium (led by the Zoological Society of London (ZSL) with partners Associação do Meio Ambiente (AMA); UniLúrio; CORDIO East Africa; Univ. NOVA de Lisboa; and Univ. Aveiro). The project team have recently launched the 'Toolkit for LMMA establishment: A case study of Our Sea Our Life's approach to community-based marine conservation in northern Mozambique'! Available in both Portuguese and English, the toolkit is designed to help organisations who wish to support local communities in Mozambique to manage their own marine resources and build sustainable livelihoods.

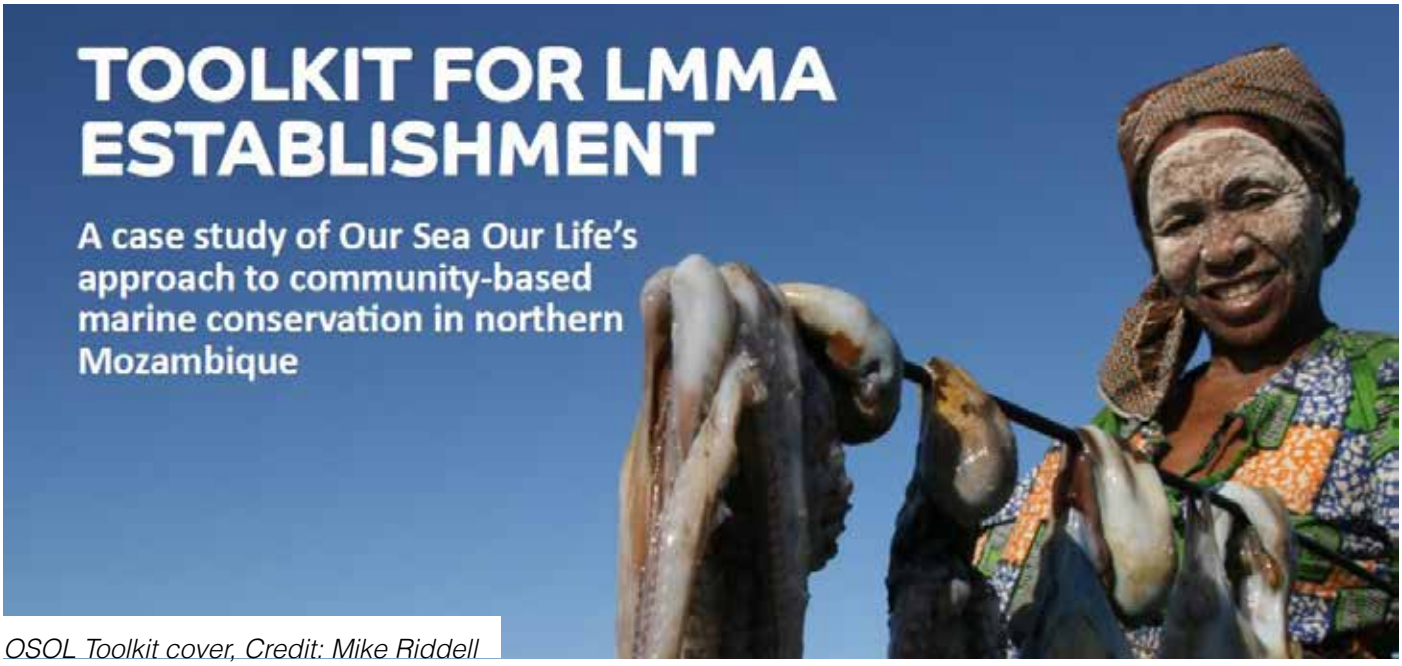
> "The toolkit is designed to help organisations who wish to support local communities in Mozambique to manage their own marine resources and build sustainable livelihoods"

This wide-ranging, yet thorough, toolkit provides step-by-step guidance covering all aspects of the OSOL approach and process: from identifying communities with potential for LMMAs, through the participatory design of management measures, to establishing Village Savings and Loans Associations (VSLAs) and alternative livelihoods, to community-based biological monitoring.

> "Replicating this model will enable the connection between marine conservation interventions with community needs for basic financial services, by scaling up VSLAs that will work to empower community members to diversify their livelihood options, increasing social resilience and food security"

Replicating this model will enable the connection between marine conservation interventions with community needs for basic financial services, by scaling up VSLAs that will work to empower community members to diversify their livelihood options, increasing social resilience and food security. Since its start in 2013, with support from the Darwin Initiative, the programme has established 60km^2 of protected areas, supported the creation of over 40 VSLAs (linked to bivalve aquaculture and horticulture activities) benefiting over 6,000 people in northern Mozambique alone. The aim is to reach thousands more people along the coast, with local communities at the heart of marine resource management.

For more information on project 25-024, please click **here**.



OSOL Toolkit cover, Credit: Mike Riddell

Demonstration plots installed in beneficiary farms to serve as training sites, Credit: WCS Paraguay

Conserving the Paraguayan Chaco while promoting sustainable ranching

Despite Paraguay being one of the world's ten largest beef exporters, many of its 182,000 Chaco inhabitants have unmet rudimentary needs. In the Chaco Department of Alto Paraguay, where the ranching industry is responsible for almost 50% of total employment, the Basic Unsatisfied Needs (NBI) index shows that over 40% of the population has unmet basic needs, including housing, water, sanitation and education. This situation is aggravated by the area's relative geographical isolation, coupled with weak government technical assistance.

> "The project aims to increase production efficiency, secure access to markets and as a result, income, as well as reducing overexploitation of natural resources and conflict with wildlife"

To address issues associated with biodiversity loss and access to basic needs, the project "Conservation and poverty alleviation through sustainable ranching in Paraguay", led by the Wildlife Conservation Society (WCS) with support from the Darwin Initiative, is providing technical assistance for environmentally responsible and efficient livestock management to eight large ranchers and over 190 small ranchers.

The project aims to increase production efficiency, secure access to markets and as a result, income, as well as reducing overexploitation of natural resources and conflict with wildlife. Project beneficiaries sign an agreement with WCS whereby they commit to conservation actions, in exchange for receiving assistance to achieve more sustainable and improved livestock management and, in the case of small ranchers, access to clean water.

Over the past months, these rural communities suffered severe impacts to their agricultural production, when Covid-19-related restrictions added to the already devastating effects of a six month long period of drought. The situation was crippling for many producers who were forced to seek alternative sources of income in an effort to provide for themselves and their families.

Given this dire situation, beneficiaries requested that the project expand its actions to include not only support for market-driven cattle production - since sales and prices plummeted and were at their lowest in years - but also assistance in food security, specifically crops for their own consumption. For most of these 190 families, our project was their only form of aid during the pandemic.

> “Beneficiaries requested that the project expand its actions to include not only support for market-driven cattle production - since sales and prices plummeted and were at their lowest in years - but also assistance in food security, specifically crops for their own consumption”

As a contingency plan, and through the application of adaptive management, we first provided these families with seeds for vegetable gardens, along with other materials such as shade nets and wires to fence their plots. Through the support of our partner, the Vice Ministry of Livestock, we are able to continue to provide assistance to improve sustainability in cattle production. Additionally, we are delivering artisanal water filters to 40 of these families, along with training for better water management, to help diminish the incidence of diseases related to bad water quality. This is a clear example of a positive mutual benefit, where communities commit to safeguard their natural resources and, in turn, are provided with secure livelihoods in the short and long term.

For more information on project 26-013, please click **here**.

Water filters delivered to project beneficiaries to diminish water-related diseases, Credit: WCS Paraguay

Lake Victoria at Jinga, Credit: Steven King

Natural capital accounts as a tool for fisheries management

Uganda's fisheries are critical for livelihoods and food security, as well as an important export. However, overfishing and ecosystem impacts such as water pollution pose a significant risk to the sector. The Government of Uganda with support from UN Environment Programme World Conservation Monitoring Centre, International Institute for Environment and Development and the Institute for Development of Environmental-Economic Accountings, has developed a set of natural capital accounts to help inform actions to address this issue. The natural capital accounts will allow for informed decision-making and policy formulation to aid the sustainable management of sector and the freshwater ecosystem assets and fish stocks that support it. This is crucial to maintain the livelihoods and food security benefits the fisheries sector provides.

Uganda's fisheries are a major source of food, livelihoods, local economy and export earnings. It is estimated that between 1.0 and 1.5 million Ugandans work directly in capture fisheries, with another 5,000 people engaged in the industrial processing fisheries sector. The overall economic contribution of the fisheries sector to the country's economy accounted for 1.6% of Uganda's GDP in 2016. However, this is likely to be an underrepresentation, given that at least 80% of fishers are categorised as 'artisanal', meaning fish are largely caught for domestic use or sold directly to consumers.

Over recent years, overfishing, the use of destructive fishing methods and illegal fishing have had significant impacts on fish stocks. For instance, around 40% large species captured in Lake Victoria are immature, meaning they are caught before they can reproduce. Capture fisheries are further threatened by pollution and invasive species. Collectively, these pressures have huge implications for freshwater biodiversity, food security, health and livelihoods in Uganda.

> "Uganda's fisheries are a major source of food, livelihoods, local economy and export earnings"

The lack of information on artisanal fisheries in Uganda's national accounts means that government officials and policy makers lack the necessary information when making decisions that directly affect the sector. Thanks to funding from the Darwin Initiative, this project is addressing this information gap. Working with the Government of Uganda, the project has now delivered the first set of integrated natural capital accounts for the major capture fisheries and associated ecosystems in the country.

Ugandan landscape, Credit: Nina R (CC BY 2.0)

> By linking information on fish catch with information on fishing effort, the economic and social arguments for a more long-term sustainable use of this resource can be made

Collectively the accounts deliver a coherent picture of trends in physical and monetary values of fish catches, with consideration given to fishing effort, fish stocks and freshwater ecosystem condition. By linking information on fish catch with information on fishing effort, the economic and social arguments for a more long-term sustainable use of this resource can be made. This can direct local and national policies and actions towards reducing damage from fishing activities or infrastructure investment to reduce post-harvest loss. The accounts also draw attention to areas where ecosystem investments can be made to boost fishery stocks and freshwater biodiversity generally, for example by nursery ground protection, reducing the abundance of invasive weeds and addressing water pollution.

Sustainable development of Uganda's fishery sector can only proceed if the social and economic opportunities it provides are understood in the context of the natural capital that supports it (i.e. the stocks of fisheries and the condition of ecosystems they live in). Through this Darwin project, the foundations for an information system on the economic, social and environmental dimensions of the fisheries sector have been laid. This will directly benefit decision-makers to achieve national objectives for fisheries and also to deliver on international commitments, such as reporting on SDG indicator 14.4.1 (Proportion of Fish Stocks within biologically sustainable levels).

The outputs from the project are also important for highlighting data gaps. For instance, where investment in stock assessments and environmental monitoring should be prioritised for improvement of the accounts in future iterations.

For more information on project 25-008, please click **here**.

Ipomoea robertsiana *a sweet potato crop wild relative, Credit: P. Moila*

Building capacity for crop wild relative conservation in Southern Africa

Crop wild relatives (CWR) are wild plant species closely related to modern crops and their wild ancestors. They are potential sources of beneficial crop traits such as pest and disease resistance, yield improvement, drought tolerance and salinity tolerance. They may also contain adapted genes that are useful for coping with climate change and environmental stress. CWR trait diversity is increasingly used in breeding programmes for novel cultivar (plant varieties that have been produced through selective breeding) development. Globally, the value of benefits from CWR is between USD $42 – 120 billion. Their value lies in increasing sustainable food production, mitigating climate change impact, enhancing long-term food and nutrition security, and contributing to poverty alleviation.

Southern Africa is a diverse CWR region with more than 1,900 species related to crops that are cultivated for a wide variety of reasons, including nutritional, ornamental and medicinal uses. Despite their importance, the conservation of CWR species remains a challenge, with many species believed to be under threat due to habitat degradation, deforestation, climate change and the introduction of invasive species. One of the main issues is the current lack of technical capacity within the region to undertake in situ conservation targeted to CWR, to identify priority CWR and selection of priority conservation for reserve establishment. In addition, many CWR species are also barely accessible to breeders and farmers who could benefit from their use.

With the financial support from the Darwin Initiative, the Alliance of Bioversity International has teamed up with the International Center for Tropical Agriculture to lead a three year project entitled “Bridging agriculture and environment: Southern African crop-wild-relative regional network.” The project is implemented in partnership with the University of Birmingham (UK), the Southern African Development Community (SADC) Plant Genetic Resources Centre, the Malawi Plant Genetic Resources Centre, the Tropical Pesticides Research Institute (Tanzania) and the Zambia Agriculture and Research Institute.

> “Despite their importance, the conservation of crop wild relative species remains a challenge, with many species believed to be under threat due to habitat degradation, deforestation, climate change and the introduction of invasive species”

A wide variety of crop wild relatives, Credit: M.E. Dulloo

The project seeks to enhance the conservation of CWR both in their wild habitats and in gene banks in order to facilitate their use, establish a regional CWR network of in situ conservation in Southern African, identify national priority CWR conservation sites, and develop National Strategic Action Plans (NSAP) for the conservation and use of CWR in Malawi, Tanzania and Zambia. In addition, the project is set to offer designed mechanisms to enhance the benefits for farmers from conserving CWR as well as ensure access and benefit sharing mechanisms for increased access to CWR germplasm in accordance with the Nagoya Protocol and the International Treaty on Plant Genetic Resources for Food and Agriculture.

> "The project is set to offer designed mechanisms to enhance the benefits for farmers from conserving crop wild relatives as well as ensure access and benefit sharing mechanisms for increased access to germplasm"

The project is working to strengthen the scientific and technical capacities in the region in CWR conservation planning and to equip the participants with the necessary knowledge to develop their respective action plans.

However, things haven't been straightforward for the project. The training programme on CWR conservation planning has been impacted due to the current Covid-19 restrictions in place in the target countries. The face-to-face training workshop was scheduled for late October 2020 but, given the restrictions, the team decided to convert both the preparatory phase and the physical workshop into flexible modular online sessions.

"Our challenge was not only to distil a three-day training workshop into a minimum of ten hours online but mainly to assist the participants in using very specific techniques in an attempt to engage them effectively to have a meaningful outcomes such as national CWR checklist, CWR priority list for conservation, the distribution of national priority CWR and the identification of sites for their active in situ conservation," said Joana Magos Brehm who organised the training, noting that an interactive toolkit for CWR conservation and previously developed tools were essential for the workshop.

"At the end of the day, the Covid-19 pandemic helped enable us to meet our training objective, with more participants finally joining the online course that would have been possible otherwise. This augurs well for the project and will exceed our targets in number of stakeholders being trained in the region," said Ehsan Dulloo, the project coordinator from the Alliance.

For more information on project 26-023, please click **here**.

Farmer demonstrating diversified plot at La Palma Ometepe, Credit: FFI, Alison Gunn

Community-led stewardship and conservation of the Ometepe Island Biosphere Reserve

The remarkable island of Ometepe in Lake Nicaragua consists of one dormant and one active volcano. Ometepe is designated as a UNESCO Biosphere Reserve and Important Bird Area in recognition of the importance of the island's biodiversity-rich wetlands and humid and dry forests, which provide ecosystem services for the islanders who are mostly involved in small-scale subsistence farming.

Local livelihoods and food security are currently at risk. Rural socio-economic vulnerabilities have been exacerbated by the Covid-19 pandemic, combined with the impacts of increasingly unpredictable weather patterns and natural disasters - most recently, tropical storms and associated landslides. As a result, there is high demand on Ometepe for agricultural land, with progressive encroachment up the forested volcano slopes, with islanders becoming increasingly dependent on natural resource extraction.

For more than a decade Fauna & Flora International (FFI) has been working with local partners and islanders on Ometepe to increase grassroots participation in biodiversity conservation and make use of local natural resources more sustainable. As part of our approach, we work with local farmers to help them adopt environmentally sensitive farming practices, whilst also generating benefits such as year-round production to improve local people's resilience against climate change. Gender-specific knowledge, skills and perspectives and the different roles that men and women play are highly valued and considered in our approach.

> "There is high demand on Ometepe for agricultural land, with progressive encroachment up the forested volcano slopes, with islanders becoming increasingly dependent on natural resource extraction"

With support from the Darwin Initiative, FFI and local partner Biometepe, are now scaling up efforts to support sustainable farming on Ometepe. In addition, the project will focus on increasing local understanding of the value of biodiversity and encouraging community-led conservation. The project is supporting an expanded team of agroecological extensionists, employed by Biometepe, who will provide on-farm support to 200 farming families (including women-headed farming

households) throughout the project. Since the start of the project in July, FFI's and Biometepe's specialists have facilitated 18 farmer training workshops on agroecological practices, including soil health and composting, cultivation of mycorrhizae (mutual relationships between fungus and plant species), agroforestry, biodiversity conservation and climate adaptation.

The project aims to foster new social norms and promote widespread uptake of agroecological production across the island. A key project strategy is to promote farmer-to-farmer learning and support through Ometepe's Network of Agroecological Producers, which FFI helped establish in 2017. The project is facilitating regular meetings of Network members, as well as farm visits, to share knowledge and experience of sustainable practices and motivate more of Ometepe's female and male farmers to adopt an agroecological approach.

Meanwhile the project team have been busy working with local stakeholders to develop a series of protocols for community involvement in environmental monitoring, including monitoring overwintering survival of migratory birds [**MoSI website**], farmer-led monitoring of biodiversity on farm plots and locally-led freshwater monitoring (in coordination with local drinking water committees). FFI and Biometepe have trained and mobilised teams from four communities for the protection and monitoring of forest areas identified as priorities for conservation of Ometepe's population of Endangered yellow-naped parrots, which are a target for the illegal pet trade. Four community-run nurseries focused on propagation of native forest and fruit trees have been established, with over 10,000 seedlings propagated to date.

Overall, this project aims to demonstrate how livelihood and conservation benefits can be achieved through strong community engagement in forest stewardship, sustainable agriculture and improved market access for smallholder farmers. Over the next three years, we aim to improve the social and economic resilience of small-scale and subsistence farmers, reduce deforestation pressures and contribute to the long-term health of Ometepe's valuable ecosystems.

For more information about project 27-010, please click **here**.

"Overall, this project aims to demonstrate how livelihood and conservation benefits can be achieved through strong community engagement in forest stewardship, sustainable agriculture and improved market access for smallholder farmers"

Farmer propagating native trees, Credit: FFI, Alison Gunn

Harvesters on a trip up to Mt Mulanje to harvest grass for broom making, Credit: Kondwani Chamwala

Making a living on Mt Mulanje grass

It is 3:00am in Nessa village, located at the foot of Mt Mulanje, about 80 km away from Malawi's commercial city of Blantyre. Regina Supuliano joins other local women for an early morning expedition, and they are soon joined by a couple of young boys and girls, rounding the group off to about ten people. Each one carries a sickle, a small bag of maize flour, small Bonya fish, tomatoes and sometimes a sachet of cooking oil – all to serve as food for the trip. The team starts their journey at the east of Mt Mulanje, passing through the village and the smallholders' fields, up a steep and tedious climb vacant of shade from mature trees. Eventually they enter a densely forested section of the mountains and travel even further through dense vegetation before the path breaks out into the open grassland, high up the mountain.

After four hours of climbing they are rewarded with the view from the top of Mt Mulanje, where Supuliano and her team have created a self-employment opportunity to expand their livelihood options. The Mt Mulanje Biosphere Reserve serves as a haven to many species of unique plants and animals, including some that are economic resources to local people, like the broom grass and *Xerophyta splendens*, which this group use to make one of the most common household cleaning tools – the broom.

> "This is a hard task, walking up the mountain, weaving and carrying the grass down is not easy but we are used to it."
>
> *- Regina Supuliano from Nessa village*

"We spend two or three days up here and wait for the grass to dry a little bit while we are weaving a few from already dry grass," said Supuliano.

The price per broom is not huge but Supuliano and her team work extra hard to make many brooms so that the cumulative total becomes meaningful to the group.

"This is a hard task, walking up the mountain, weaving and carrying the grass down is not easy but we are used to it. We get K30 per broom (so 25 brooms makes US$1)," she added.

She is a mother of 4 children who has relied on weaving brooms to support her family and her children's education.

"We sell the brooms and get money for food and some basic things for our kids".

The women from the Mt Mulanje boundary, particularly those from the villages of Nessa, Bondo, Namainja and Fort Lister, all collect the grass and weave brooms in this way to make a living. Middlemen come to buy these brooms wholesale and take them far and wide across Malawi to sell.

> "Low wholesale prices drive people to need to harvest more to survive, and everything combined leads to increased wildfires, a lower quality and quantity of harvestable plants and less diversity of products available on the mountain"

The collection of these plants from Mt Mulanje for broom making is a free activity for communities and they currently do not participate in management of the sites they collect from. It is also not the only resource local people use the mountain for, as many other plants and animals are harvested too. Low wholesale prices drive people to need to harvest more to survive, and everything combined leads to increased wildfires, a lower quality and quantity of harvestable plants and less diversity of products available on the mountain. This ultimately creates challenges to the sustainability of these local industries.

Mt Mulanje Biosphere Reserve supports the livelihoods of over 500,000 people that live in tightly packed communities around the base of the reserve. They are poor and have limited access to land for agriculture or other livelihoods activities. Currently they are reliant on the mountain for a diverse range of non-timber forest products that play a crucial role in their social and economic survival. In short, the reserve becomes a coping mechanism for these boundary communities in times of acute food shortage. Through our project we are working to improve the livelihoods of local communities in and around Mt Mulanje through our conservation-commerce approach to benefit Mt Mulanje cedar and other over-exploited species – ultimately maximising benefits to the community and for biodiversity conservation.

Further information on project 26-017 can be found **here**.

Broom grass drying out in the sun before being made into brooms, Credit: Kondwani Chamwala

A rare Arbutus Tree (Qaiqab), Credit: Palestine Institute for Biodiversity and Sustainability

Efforts to encourage and promote traditional knowledge to increase sustainability

Have you ever wondered how traditional knowledge can help fulfil the UN Sustainable Development Goals related to human sustainability and environmental conservation? Our project funded through the Darwin Initiative, titled "Biodiversity conservation & community development in Al-Makhrour Valley, Palestine" provides some useful insights. Local communities in the Fertile Crescent are descended from ancestors who developed agriculture and lived in relative harmony with nature. This has resulted in over 11,000 years of accumulated knowledge and experiences to learn from! Through our project, we believe that these lessons and this wealth of traditional knowledge should be utilised and shared with modern day farmers to not only help them improve the quality and quantity of their produce, but also protect precious natural resources at the same time.

The Palestine Institute for Biodiversity and Sustainability at Bethlehem University (**palestinenature.org**) and project partners worked closely with 82 farmers from the communities of Battir, AlWalaja, Husan, and Beit Jala, who inhabit and utilise land that is considered to be a part of the UNESCO World Heritage Site. We adopted a knowledge-based approach to help gain a greater understanding of what farming practices would be most suitable for the local conditions and to get a better grasp of traditional practices. Data was gathered on both tangible and intangible cultural heritage related to nature and agriculture. In an effort to raise awareness and educate the communities, a series of workshops were conducted focused on cross-training and experience sharing.

One of the strengths of this approach was the involvement of local communities at every stage of the project. Through the project, skills were revived, traditional techniques were reintroduced for water harvesting, pest management, composting as well as crop diversification through the use of native seeds.

> "Through the project, skills were revived, traditional techniques were reintroduced for water harvesting, pest management, composting as well as crop diversification through the use of native seeds"

The work actually gained more prominence throughout the lockdown period, with locals seeing it as a way to develop self-reliance, increase their economic well-being, and also increase their resilience during times of uncertainty.

For more information on project 25-030, please click **here**.

General project updates

Water transport on the Lukanga Swamp, Credit: Clara Nanja

Salvinia molesta *on the Lukanga Swamp, Credit: Kelvin Mkandawire*

Tackling alien invasive species - benefitting nature and people on the Lukanga Swamp, Zambia

"The Lukanga Swamp facilitates feeding my family, taking my children to school and supporting my now aged parents in the village", says Mutale Chanda, a local fisherman, explaining how the swamp has been a major source of income and livelihood. "Before now, I have been worried about the future of the swamp because of the invasive Salvinia molesta which has reduced my fish catch and reduced my earnings".

Another village member, Mr Mwansa is excited that the restoration of the Lukanga Swamp through removal of the invasive aquatic weed through use of a host-specific weevil species - *Cyrtobagous salviniae*, as biocontrol agent is working. "We have now seen fish breeding grounds and canals clearing. I thought the weevil was too small to get the job done, but look, navigation into the swamp is easier now. Thank you, BirdWatch Zambia!".

The Lukanga Swamp is one of Zambia's eight major wetlands and is categorised as a Ramsar site. The site is an Important Bird and Biodiversity Area (IBA) covering approximately 3,300km^2 and hosting over 360 resident and migratory bird species. Fishing is one of the main activities that takes place, with the swamp contributing to around 10% of Zambia's national fish supply. The invasive Kariba weed (*Salvinia molesta*) has infested the Lukanga Swamp ecosystem since 2009. Over the years, the invasive weed has grown to cover an approximate area of 2,000km^2 - which equates to over 50% of the swamp's surface area. This has resulted in several challenges such as increased difficulty navigating, the creation of a breeding area for mosquitos, reducing suitable habitat for birds and other biodiversity and negatively impacting the amount of fish local communities are able to catch – further exacerbating poverty. Kariba weed forms a mat on the water, reducing sunlight and oxygen, ultimately leading to death of fish. This has led to the use of inappropriate fishing methods like mosquito nets and poison in a bid to catch more fish.

Since 2013, BirdWatch Zambia (BirdLife Partner) has been involved in controlling the weed. Initially, this was done manually where community members used sickles, rakes and pitchforks to remove the weed. However, this method proved unsuccessful due to its nature, with spores quickly dispersing and germinating leading to rapid regrowth. In 2017, BirdWatch Zambia, through BirdLife International, secured funding from the Darwin Initiative for a multi-year project to control the invasive weed using a natural enemy for improved habitat and livelihood.

"It is such a delight to see the Lukanga habitat improve from when I first saw it in 2017", notes Clara Nanja, BirdWatch Zambia's wetlands project coordinator. "The community is benefitting; the birds are coming back and the goal is being met steadily. The weevils have proven they're resilient, self-sustaining and have highly adaptive behaviour in the Lukanga, at present covering an area of about 1538km^2 - as shown by our weevil monitoring and satellite imagery maps" she adds.

Clara expects that once the weed is controlled there will be improved fish catch, restored habitats and an increase in the populations of globally threatened birds and other species – not only benefitting biodiversity but also the livelihoods of over 2,500 fishermen by the end of the project in 2021.

For more information on project 24-030, please click **here**.

Community members of Gathiuru Community Forest Association, Credit: Martin Kiama

Communities in Mt Kenya forest actively engage in forest restoration

2020 has been a difficult year for many due to the unforeseen impacts of the Covid-19 pandemic – which called for major adjustments and adaptation to the new normal. This is exactly what the Mt Kenya forest adjacent community did – they embraced adaptation to ensure that the Mt Kenya forest was protected and restored.

Local community members organised into community forest associations took advance of the favourable weather to plant trees in degraded forest areas ensuring to follow government advice on social distancing and face covers at all times. The community recognised the importance of forest restoration to restore vital ecosystem services like water used for agriculture and industries.

> "The community recognised the importance of forest restoration to restore vital ecosystem services like water used for agriculture and industries"

During the planting season in 2020, the Community Forest Associations supported by Nature Kenya through our Darwin project were able to restore 500ha of degraded forest by planting 500,000 indigenous tree seedlings! As a result, bird species have increased in areas where seedlings were planted, providing a clear indication that as trees mature they restore biodiversity comparable to that of the close canopy indigenous natural forest in the Mt Kenya reserve.

> "Through this effort to restore the forest, drivers of biodiversity decline are also being addressed, allowing vital ecosystem services to be restored"

Through this effort to restore the forest, drivers of biodiversity decline are also being addressed, allowing vital ecosystem services to be restored. The Mt Kenya forest adjacent local community have continued to demonstrate their commitments to safeguarding the forest for the benefit of all, enabling them to build partnerships with the private sector to support forest restoration.

For more information on project 25-031, please click **here**.

Young fisherman on the Lukanga swamp, Zambia, Credit: Clara Nanja

Newsletter Contacts

The Darwin Initiative Secretariat (Defra)

The Darwin Secretariat is based in Defra and includes Tim Pryce, Scott Nelson and Chelsea Goodwin.

If you have any general queries about how the Darwin Initiative operates please e-mail us at **darwin@defra.gsi.gov.uk**

For any queries on project applications or existing projects please contact our Darwin Administrators (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**

The UK Government's Darwin Initiative aims to promote biodiversity conservation and sustainable use of resources around the world including the UK's Overseas Territories. Since 1992, the Darwin Initiative has committed over £177 million to 1,220 projects in 159 countries.