









STORIES FROM A CHANGING WORLD

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STORIES FROM A CHANGING WORLD 2022

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CENTRAL AMERICA: COULD TECH AND TRADITION SAVE THE FARMERS OF THE "DRY CORRIDOR"?

Covering six countries and stretching for more than 1600 kilometres, the Central American Dry Corridor is one of the world's harshest climate hotspots. Home to around 11 million people, nearly a decade of drought has fuelled not only poverty and hunger, but is one of the main drivers of migration northwards to the United States. The World Bank predicts up to four million climate refugees will flee the area by 2050.

Now, an initiative by the European Union's DeSIRA programme is bringing hope to more than three thousand small-scale farmers and their families across Panama, Costa Rica, Guatemala, Honduras, El Salvador and Nicaragua. DeSIRA - which stands for Development Smart Innovation through Research in Agriculture – has put €6 million into the AgroInnova project which aims to help farmers become more resilient to the devastating impacts of climate change.

The two-year project combines agroforestry with crop diversification to show farmers that a sustainable, more productive future is possible. But this is no theoretical exercise - demonstration plots have been established in all six countries so farmers can see for themselves how to grow droughtresistant varieties. At the same time, nurseries are providing seedlings for future tree planting.

"Agroforesty systems combine trees and crops," explains



Cecilia Guerra, a postgraduate student working for the Costa Rica-based Tropical Agricultural Research and Higher Education Center (CATIE), one of two partners helping to implement the project. "Today these systems represent a real option for the dry corridor. It's an innovative solution – in the short term we are growing alternative crops to feed ourselves, and in the long term we have the timber. The trees we grow in the nursery act as a kind of money in the bank for the future."

"We opened food banks to support the most vulnerable people in need," says Guillermo Destlefsen, an agroforestry systems specialist with CATIE. "The food banks are supplied with fresh produce from the demonstration plots. We just adapted the plots to provide the food that was needed."

AgroInnova's other implementation partner, the Inter-American Institute for Cooperation on Agriculture (IICA), developed an app designed to provide up-to-date information on biosafety measures, protect the health of workers in the farming and food supply chain, and ensure food supplies were kept running. With the AgroInnova project scheduled to end in 2023, results are already looking promising.

Despite the challenges, AgroInnova has demonstrated the value of innovative tech combined with traditional local know-how. As IICA Director General Manuel Otero points out, *"Without* science and technology, it would be very difficult for agriculture to meet the productive, environmental and social challenges it faces. Farming produces food for the world's population, and it requires all the support it can get to incorporate technological advances."





BLOWING IN THE WIND: FARMERS IN CAPE VERDE AIM FOR SUSTAINABLE FOOD PRODUCTION

A hot, dry wind whips over the dusty fields of Santo Antão, the most northerly of ten islands that make up Cape Verde, 800 km off the west coast of Africa. The strong gusts of wind also threaten to remove the hat of farmer Alfredo Sendim, who is showing a group of young people how to enrich the sandy soil with compost.

"The conditions here are really harsh," explains Alfredo, who is working in the Casa do Meio experimental field – a testing ground for new, sustainable farming practices near the coast. "It's really tough to transform what is essentially a desert. The lack of water, the wind and the sun make it a really difficult process. But we are determined."

Alfredo and his fellow farmers from the Montado Freixo do Meio co-operative on Santo Antão live on the very edge of climate change. Seven out of every ten islanders live in rural areas and are heavily dependent on agriculture – yet unpredictable rainfall patterns, droughts and desertification are increasingly a way of life. The strong Atlantic winds which blow all year round cause significant soil erosion.

"Unfortunately global warming is increasing the the degraded areas in Santo Ant \tilde{a} o," local farming expert Amilton Lopes told a recent workshop on sustainable food production. "Every day we witness the issue of the wind – the wind is without a



doubt the biggest enemy of farming. It causes intensive erosion and combined with increasing temperatures it is having a big impact on the soil. We are living in a vicious circle."

Amilton, a technical coordinator with ADPM Mértola, is one of those supporting Cape Verde's farmers as the take on the biggest challenge yet – how to grow food sustainably in this unforgiving landscape. As part of the five-year EU-funded €12 million GCCA+ West Africa programme, the Cape Verde Agro Floresta project covers a wide range of sustainable agriculture techniques such as growing drought-resistant crops and planting ground cover to tackle desertification.

"Agroforestry is an ancient agro-ecological technique which aims to increase farming productivity," he explains. "It's come back into fashion because it conserves water and increases the amount of organic matter in the soil." Traditional, low-tech solutions not only cost less but are often more effective. For example, nests made from straw or waste sugar cane are built around fruit trees and other plants to retain moisture, provide protection from the wind and enrich the soil.

Back in the Casa do Meio, Alfredo explains the importance of agro-ecology to his students. "We established this field last year, but setting it up was only five percent of the work. The real hard work comes in maintaining the land – it needs years and years of maintenance. We take a lot of organic vegetable matter, cut it, mix it and put it back into the soil. That way, the trees grow faster and feed back into the soil – it's a sustainable cycle," he says.

High on the central plateau of Santo Antão, at the Planalto do Leste experimental field, Amilton is planting tagasaste, or tree lucerne, one of nature's true wonder-plants. It can capture nitrogen from the air to improve soil fertility, grows up to seven metres tall to act as a wind-break, and can be fed to cattle and poultry. "You can feel the soil is damp, which is what we want," he explains. "Tagasaste is excellent for composting and improving the soil, helping it to retain moisture. We will also dry it to produce animal feed, then we can start training farmers on animal nutrition and animal feed production."

Water shortages are a constant challenge in Cape Verde – according to the World Bank, around a fifth of all rainfall is lost through surface runoff, and two-thirds of it simply evaporates. As well as encouraging sustainable food production, the EU GCCA+ project will implement a system for capturing water from fog, collecting rainwater and installing drip irrigation powered by solar panels.

"We have a triple crisis," said the country's Minister of Agriculture and Environment Gilberto Silva on a recent visit to



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the GCCA+ project. "A climate crisis, a crisis provoked by the pandemic and a food crisis caused by the war in Ukraine. We are a small island state very vulnerable to climate shocks, and these crises have impacted a lot on our country. We need to find and accelerate solutions for the farming and food sector in Cape Verde."

Alfredo Sendim agrees. "We are all in this together. For a long time we have been only dreaming of doing this, but now we are solving problems in a way that is compatible with nature. That's what we are re-learning, isn't it? How to create self-sufficient systems that do not need things brought from the outside, that are in harmony with our ecosystems."

"That's very important because it will give us resilience," he concludes. "It will give us food sovereignty, it will give us independence, it will give us dignity as human beings in a very different way."



ZIMBABWE: CLIMATE-SMART TECHNOLOGIES FOR POST COVID-19 FOOD SECURITY

In Southern Africa, the disease burden, lockdowns and other restrictions associated with COVID-19 have disrupted food value chains at both production and marketing levels. The shock induced by the pandemic has compounded the impact of climate change (manifested by rising temperatures and growing aridity but also with torrential rainfall episodes) on agrifood systems – making them more vulnerable and negatively affecting the food and nutrition status of millions of households, including those whose livelihoods depend on subsistence and small-scale agriculture.

In response, the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) launched a project to mitigate the impact of COVID-19 on food and nutrition security in Zimbabwe (as well as Eswatini, Mozambique and Zambia) using climate-smart technologies. This project is funded by the Intra-ACP GCCA+ programme in the Southern African Development Community (SADC) region, and in Zimbabwe it is managed by the Grow a Tree Foundation (GTF).

The Zimbabwe project component, launched in December 2020 and with a duration of 18 months, is carried out on a 3.5-hectare estate in Gwangwawa, a village in the Rushinga District of north-eastern Zimbabwe. It supports a community of

100 households through a range of activities aimed at climateproofing and diversifying agricultural production.

It supports the planting of fruit, moringa and baobab trees, the drilling of solar-powered boreholes to secure horticultural and fruit production, the expansion of solar-powered drip irrigation, and the dissemination of efficient cookstoves to reduce wood fuel consumption. It has also assisted with the registration of companies that will help local farmers commercialise their produce, and is training them in climate-smart agronomic practices and financial management.

After one year of implementation, the results are already visible in the form of increasing horticultural production. There are plans to expand to other product lines such as beekeeping, fish farming, chicken and goat rearing, and groundnut and baobab pulp processing. The initial success has helped attract interest from banks, which have lent money for fencing and offered financial services. This all helps develop a sustainable alternative to livelihoods based on gold mining, tobacco production and charcoal making.

The Zimbabwe project is one the four projects launched by CCADESA, with technical support from Bembani Group, to mitigate the impact of COVID-19 on food and nutrition security using Climate Smart Technologies. The other three are in Eswatini, Mozambique and Zambia. CCARDESA was founded by SADC Member States to harmonize the implementation of agricultural research and development in the SADC Region.



TREES, COWS, AND BEES: A **SUSTAINABLE FUTURE FOR FARMING AND FORESTS IN** MONGOLIA

Urantsetseg Tsend is a busy woman, but as she rushes between milking her cows, checking her bee hives and tending her tree nursery, she takes time to explain her passion for farming and nature in this remote region of forests, grasslands and mountains in northern Mongolia.

"My biggest goal is to hand down our forest to future generations," she says. "I believe that the protection of forests and nature is the as beneficiaries on the project, and we're looking forward to responsibility of all people and communities."

It's a philosophy Urantsetseg shares with her fellow herders and Forest-friendly activities such as bee-keeping are a priority. farmers in Binder, a 'soum' (county) more than 400 km from the capital Ulaanbaatar. In addition to looking after her farm, her husband, her children and grandchildren, she somehow finds because bees play an important role in pollination to increase time to lead the local Delger-Onon forest user group (FUG). The biodiversity. Of course, FUG members know the importance FUG has a large nursery for coniferous and broad-leaved trees, of not grazing livestock in areas where natural regeneration is and harvests nearly two tonnes of pine cones every year.

members from 24 households, but it's not It's not always easy She's been working this land for 30 years, and before that she organising the members and getting them to participate. As and her husband drove tractors and combine harvesters for a leader, I organise activities and encourage members to take part," grain cooperative. In 2000, the couple started a bee keeping explains Urantsetseg. "During the spring and autumn droughts, and forestry business in addition to livestock herding. Her community members conduct daily fire patrols and carry out forest energy and passion are all the more remarkable considering thinning activities over a 15 hectare area. We also keep an eye out she has had to overcome serious health issues. "A few years ago for illegal logging. We've worked hard to achieve our goals."

Since 2021, the FUG has been working with the Sustainable Resilient Ecosystem and Agriculture Management in Mongolia (STREAM) project, which supports local communities with sustainable landscape management and food security. Cofunded by the EU GCCA+ and the German Federal Ministry of Economic Cooperation and Development (BMZ). STREAM aims to help farmers and herders thrive in the face of climate change.

The UN estimates that around ninety percent of Mongolian grassland is vulnerable to desertification, and that three-quarters of pasture land is already degraded. So far, Binder soum has escaped the worst of the impacts. "As a herder, I haven't noticed any significant desertification," says Urantsetseg. "Compared to previous years, the growth of hay, compost and fodder seems to be normal. But we have experienced unusually low rainfall in winter and heavy rain in spring for two years in a row."

The three year, €4,550,000 STREAM programme is jointly implemented by the German development agency GIZ and UNFAO. "We have a very good history of working together with the STREAM forestry expert," she says. "We have gained a huge amount of knowledge from their training and technical meetings. Our FUG members are very happy to be able to work together expanding our knowledge and putting it into practice."

"Forestry and beekeeping are inextricably linked," she explains. "We put the hives near flowering plants on the edge of the forest taking place."

"I've been leader of the FUG for five years. We have 49 active There's not much Urantsetseg doesn't know about farming. I got cancer, but fortunately the treatment was successful, and

with the support of my family and community I have recovered both physically and mentally."

Mongolian herders are a tough breed. Average winter temperatures in Binder regularly plunge to -25°C, and climate change has led to unpredictable rainfall patterns, droughts and extreme weather. For a community so reliant on farming, it's an uncertain outlook.

"Livestock farming is the main source of income for local people. All the members of our FUG are engaged in animal husbandry. We produce 20-30 different local dairy products such as yoghurt, curd butter, sour cream, various creams and dry curds which we sell to increase our household income "

As Urantsetseg returns to her never-ending round of tasks, she reflects on what climate change might mean for the future. "I do believe that livestock farming, sustainable forestry and beekeeping will be passed down from our generation to next. I iust hope we can avoid natural disasters."





PACIFIC YOUTH AND THE BLUE ECONOMY

The Pacific Ocean, which covers 30% of the Earth's surface, is the source of life for Pacific Island countries, which depend on it for food, income and employment. Yet this critical resource is under threat from the impacts of climate change, marine pollution and over-exploitation.

The EU-funded Global Climate Change Alliance Plus Scaling up Pacific Adaptation (GCCA+ SUPA) project is working closely with ten Pacific Island countries to address these threats by scaling up specific climate change adaptation measures that put people at the centre of development. While the challenges are daunting, the project adopted a focussed approach to implement specific measures, one step at a time.

In the Cook Islands, major declines in marine resources have been experienced in recent decades. Outbreaks of crownof-thorns starfish, which can rapidly destroy coral reef ecosystems, have been detected in the southern Cook Islands. During a visit to Mauke in 2021 to engage with youth and adults on the application of traditional knowledge to marine resource management, local youth were trained in safe free diving techniques to remove an infestation of crown-of-thorns starfish.

More than 119 crown-of-thorns starfish were removed and outreach efforts are underway to make this activity part of a



regular monitoring and eradication programme. The project is also expanding the infrastructure and technical capacity of the Aitutaki Marine Research Station to support proactive measures such as clam aquaculture.

The volume of plastic debris entering the world's oceans and impacting marine life, water quality and industries such as tourism is one of the most serious environmental challenges of this century. The scale of the issue is intimidating.

Palau in the northwest Pacific is famous for its pristine marine environment, which attracts divers from all over the world and provides food and livelihood for Palauans. With the support of the GCCA+ SUPA project, and other initiatives, students, teachers and residents are embarking on a long-term initiative to address plastic pollution.

Plastic litter is regularly sampled from the beaches using established protocols, sorted into micro, meso and microplastic groups, counted, and the results shared with the Big Microplastic Survey, a worldwide monitoring programme pioneered by the University of Portsmouth in the UK.

Understanding the nature of the problem is the first step to effective coordinated solutions. In Palau the monitoring activity is aligned with the school curriculum, which provides for sustainability and learning. Additionally, beach clean-ups are conducted after each monitoring visit.

Small specific on-the-ground actions such as these, repeated over time and in many different locations can foster worldwide environmental stewardship and contribute to a blue economy.

Understanding the nature of the problem is the first step to effective coordinated solutions.



IS BLUE REALLY THE NEW GREEN?

Oceans are vital for regulating the climate. They absorb 98 percent of the sun's heat and distribute it via currents around the planet from the equator to the poles, affecting everything from rainfall patterns and surface temperatures to the daily weather. The oceans are also the biggest carbon sink in the world – since the 1970s, they have absorbed around half of all our greenhouse gas emissions. Yet until relatively recently, the blue side of the coin was largely ignored in favour of the green. As ocean ecologist Dr Peter Bridgewater told an EU GCCA+ regional workshop, "If you'll forgive the pun, there has been a sea change in our thinking. In 2015, NGOs [non-governmental organisations] stopped showing pictures of tropical forests and concentrated on areas of the planet – the oceans – where there is more significant carbon sequestration than forest lands."

The role of the oceans in tackling climate change has long been known, but more recently there has been a significant shift in understanding the role that marine and coastal environments play in sustainable development. That means balancing the environmental and financial health of the blue economy.

"There are many different definitions and concepts of the blue economy," explains Dr Pierre Failler, EU GCCA+ Technical Expert and Professor of Economics at the University of Portsmouth. "For me, it's not just about taking advantage from a social and economic point of view, but also from the environmental point



of view and the need to have healthy ecosystems."

Investors calculate that if the blue economy were a country, its annual GDP – around US\$2.5 trillion – would be the seventh largest in the world, ahead of Italy and Brazil. But with the global blue economy expected to grow to US\$ 3.9 trillion by 2030, who gets to decide what a sustainable blue economy looks like? How do we prevent a similar exploitation of nature, mining, tourism and other resources which has proved so destructive to ecosystems on land? *"Blue governance should sit at the centre of the blue economy,"* says Bridgewater. *"Blue governance is critical. There are so many players in this area that making sure everyone is working in as legal and effective a way is really really important."*

Unlike terrestrial ecosystems, however, the marine environment is subject to few national boundaries and – depending on your point of view – are a shared resource or an opportunity ripe for exploitation. As well as climate change, threats to the blue economy include man-made disasters such as oil spills, plastic pollution, over-development, habitat destruction, and unsustainable fishing. According to WWF, "the direct and indirect value generated by marine environments is increasingly under threat from environmental drivers. This poses a risk to current and future assets and revenues dependent on a healthy Blue Economy." Faced with the need to balance jobs and economic growth with protecting marine and coastal zones, the EU GCCA+ is working with coastal communities and small island nations all over the world to help them reap the benefits of a sustainable blue economy. From small-scale sustainable fishing to restoring mangrove forests, the focus is on boosting climate, food and job security whilst making sure that nature can thrive.

Blue governance should sit at the centre of the blue economy.



WHERE BLUE MEETS GREEN: MANGROVES "BLUE FORESTS"

'Blue forests' may sound like a contradiction in terms but, according to UNEP, "there are some very different types of forest – in and under the water – that are just as beautiful and just as precious" as any you'll find on land. "We're just beginning to understand how important Blue Forests are in keeping our planet's climate stable," says UNEP's Head of Marine and Freshwater Ecosystems Leticia Carvalho.

Mangroves are perhaps the best known of these blue forests. Not only do they soak up huge amounts of carbon – around four times more than rainforests – but they provide natural protection against increasing frequent and more intense extreme weather events such as cyclones and storm surges. Their roots shelter huge biodiversity of fish, crustaceans and shellfish, upon which some 200 million people depend on for their food and livelihoods.

Recognising their potential contribution to the blue economy, to disaster risk reduction and to carbon capture and storage, the EU GCCA+ has been working to restore, protect and replant mangroves around the world, completing 16 projects in 12 countries since 2007. In line with a balanced approach to the blue economy, these projects not only aim to tackle the global climate change and biodiversity crisis, but to provide sustainable jobs and livelihoods.



Suriname: an EU-funded €5 million programme includes sustainable beekeeping which encourages the mangroves to regenerate naturally and provides alternative incomes for around 40 beekeepers in a region where jobs are hard to come by. "*The mangroves and the bees are inseparable*," says Richenel Davids, Chair of the local beekeepers' association. "What's good for the mangroves is also good for local jobs."

Cuba: As part of Cuba's ambitious Tarea Vida ('Project Life') strategy – a 100-year plan to combat climate change adopted in 2018 – the EU GCCA+, UNDP and Green Climate Fund are restoring mangroves, seagrass beds and coral reefs to support a sustainable blue economy. "Coastal biodiversity such as coral reefs, sea grass beds and mangroves promotes economic, social and cultural development," says Project Coordinator Dr Sergio Lorenzo.

Jamaica: Following 2004's disastrous Hurricane Ivan, with EU GCCA+ support, more than seven hectares of degraded coastal areas were planted with mangroves trees, and over 1,500 square metres of seagrass replanted. *"I am passionate about the mangroves and seagrass,"* says Chalene Roye-Myrie, a marine biologist at the Jamaican National Environment and Planning Agency. "It's been a fantastic success." **Solomon Islands:** 65,000 hectares of mangroves provide food, jobs and homes for thousands of people. The EU GCCA+ funded projects in five coastal communities to replant and restore the forests. *"Losing mangroves is the same as losing your livelihood,"* says farmer Dominic Odu. "If communities continue to cut and harvest mangroves at the current rate, soon there won't be any left."

Mozambique: The €47 million EU GCCA+ programme included the restoration of nearly 230 hectares of mangroves. "Many species use the mangroves as breeding grounds," says Viejas Pedro Ernesto, an agricultural technician with the project. "But as they become deforested, these species are dying out. Now the people replanting trees as they cut them down. They can continue reaping the benefits they always have."

Bangladesh: one of the most climate vulnerable countries in the world, Bangladesh has a significant blue economy which could transform its prosperity. "The vast resources of blue economy have mostly remained untapped," says Foreign Minister AK Abdul Momen. An EU-Bangladesh collaboration aims to to develop the country's newly-expanded EEZ, to create sustainable jobs in fisheries, aquaculture and tourism, and to develop new biotechnologies.



TURNING THE TIDE FOR TRADITIONAL **FISHER FOLK IN COMOROS**

It's another hot day on the beach in the Comoros Islands. Groups funded \in_3 million GCCA+ programme to strengthen climate of women pick their way over the rocks, occasionally stooping and shouting with excitement. After three months during which zones through planned closures, the women are also taught less fishing was prohibited to allow the octopus population to recover, the beach is open again to allow traditional fishing on foot. It's no wonder the women are excited - the octopus have stones and iron bars to catch it. Now people understand that if doubled in size

"The women practice foot-fishing at low tide," explains Hilal Saidina Said Bacar, a local community worker with the NGO Dahari. "We divided the fishing zone into three sectors and closed one of them temporarily for three months. During that time fishing was forbidden. After three months, thank God, there has been a huge change. Before, we went for two years without catching an octopus that weighed more than 1.5kg - now they are regularly weighing in above 6kg."

Her friend Amina Miradji agrees. "We've never had such a yield. I wish we could do a new closure, because the last time we had good results. We had a lot of octopuses - I myself ate plenty of them!"

Comoros is one of the poorest and most climate vulnerable nations in the Indian Ocean, yet is surrounded by a marine environment which, if managed sustainably, could support employment and food security. Its exclusive economic zone

(EEZ) is around a hundred times the size of its land mass, but Although the project was aimed at both men and women, more contributes less than 20 percent to the country's GDP.

Along with other Western Indian Ocean states such as Mauritius, Mozambigue and Somalia, Comoros is experiencing a perfect storm of rising sea temperatures, ocean acidification, tropical cyclones and over-fishing. Catches have been declining steadily since the early 2000s, forcing fishermen go venture further and further from shore - with dangerous consequences.

"Sometimes we have to fish far out to sea from the island," says local fisherman Amir Youssouf. "We don't have any choice if we want to earn a living. Here in my village, some of the fishermen of my generation have lost their lives because they had to fish far out to sea. They have left their children behind as orphans."

A sustainable blue economy was an important part of the EUresilience in the Comoros. Besides managing coastal fishing damaging fishing methods. "We used to use harpoons, and if the octopus refused to come out we would smash the coral reef with the octopus hides in the coral, they should not crush the coral but prise the octopus out with wooden sticks," explains Hilal.

Now people understand that if the octopus hides in the coral, they should not crush the coral but prise the octopus out with wooden sticks.

than 80 percent of those taking part were women.

"There were octopuses all over the place!" laughs foot fisher Zainati Youssouf. "Someone even caught a 7kg octopus! I'm telling you, someone caught more than 20kg of octopuses in one day – she brought them home and sold all of them!"





THE BLUE ECONOMY **AND LIVELIHOODS:** SENEGAL AND THE GAMBIA

In 2003, the city of Saint-Louis on Senegal's Atlantic coast was threatened with devastating floods. As the waters from the Senegal River rose and the UNESCO World Heritage Site faced inundation, the city council made what they thought at the time was a sensible decision to avert disaster: they dug a two-metre wide channel through the sand dunes to divert the flood waters.

The city was saved but the unintended consequences are felt to this day. Over the next ten years the narrow trench widened to a breach nearly four kilometres across, cutting the famous Langue de Barbarie - a narrow, 30 km peninsula at the mouth of the Senegal river - in two. Parts of the dunes were submerged and some fishing communities lost their homes, their livelihoods and the land they used for growing food.

Launched in 2014 with €4 million from the EU GCCA+, an Integrated Coastal Zone Management (ICZM) scheme aimed to reverse some of the worst impacts and help the inhabitants of Saint Louis and the surrounding area become more resilient to rising sea levels. By 2019, a combination of natural and human actions had partly restored the dunes and the Langue De Barbarie was once more intact

What happened in Saint Louis is a cautionary tale for Africa's blue economy, and the list of potential hazards is ominously



long. The continent's fragile ecosystems which protect its coastlines are under threat from deforestation, sand mining, over-development and pollution.

The African Union talks of the blue economy as the "new frontier of the African Renaissance" - but that won't happen unless development goes hand in hand with sustainability. "It's not just about preserving coastal marine ecosystems, they have to be preserved in good shape," says Pierre Failler. "At the moment, for example, mangroves and seagrass beds around Africa are only generating around 45 percent of their potential value because they are in poor shape."

Yet with careful sustainable management, Africa's blue economy could be a goldmine. Thirty-seven nations in Africa have coasts and some 90 percent of the region's trade is conducted by sea, according to the University of London's School of Oriental and African Studies (SOAS). The African blue economy is valued at around US\$296 billion today, but is projected to grow to US\$405 by 2030 and US\$576 by 2063. Jobs in the blue economy are predicted to rise from 49 million today to 78 million in 2063.

Realising the potential of the blue economy whilst simultaneously tacking the climate and biodiversity crisis will be tough. But Failler is adamant that it can be done. "The blue

economy is really based on four principles," he explains. "It must be based on a circular economy. It must have good governance. Environmental and social sustainability is essential. Finally, there must be empowerment and inclusive decision making, especially for women and young people. Without those, the blue economy is just another frontier to be exploited."

Failler's four principles lie at the heart of the €5.3 million EU GCCA+ ICZM project currently underway in The Gambia, which aims to boost resilience for the 50 percent of the population who live in coastal areas. The threats don't just come from climate change - toxic pollution and plastic waste from dump sites near the shore are also a major problem - especially in the rainy season when garbage blocks the drains and swollen rivers pour tonnes of filth into the ocean. That in turn impacts those who make a living from the sea. "If you go to the coastal areas you will find a lot of women working in the fish processing industry," says Arune Jobe, GCCA+ coordinator for the ICZM project. "For a lot of them, it's a means of sustaining their livelihood."



COASTAL TOURISM IN VULNERABLE COUNTRIES: FROM BARBADOS TO THE SEYCHELLES

The blue economy is frequently associated with coastal tourism, and the figures certainly back that up - according to the World Resources Institute (WRI), 80 percent of all tourism takes place in coastal areas. In the EU alone, before the Covid crisis, coastal tourism employed more than three million people and generated €183 billion in revenue. Globally, the World Bank estimates the number of jobs dependent on coastal tourism is second only to those employed in industrial fishing.

To take just one example - a 2017 study found that 70 million trips were supported by the world's coral reefs each year, and that 'on-reef tourism' such as diving and snorkelling was worth US\$19 billion. Another US\$16 billion came from 'reef-adjacent' tourism.

How can countries which depend on coastal tourism - particularly small island developing states (SIDS) - cash in on this booming sector of the blue economy without trashing it in the process? also provide income for many local families," he explains. " EU GCCA+ funds projects around the world aimed at doing just that, some examples of actions:

whole tourism value chain, including waste. Along with other Despite Palau's remote location, pre-pandemic tourism was on SIDS, solid and chemical waste management and disposal is a the rise - tourism accounted for US\$137 million in 2019, with significant challenge. The Implementing Sustainable Low and more than 123,000 visitors. Non-Chemical Development in Small Island Developing States With the support of the EU GCCA+ SUPA (Scaling Up Pacific

(ISLANDS) programme aims to increase recycling and reduce the amount of waste going to landfill.

Seychelles: some of the most Instagrammable beaches in the world have been hit hard by rising sea levels and coastal erosion. "Fifteen years ago you could walk all along the beach to Source d'Argent," says La Digue resident Lionel Waye-Hive, who runs a family-owned boat charter and bicycle hire business. "Now it's all finished. There is no more beach. And if it goes on like this, all the houses and hotels along here will disappear as well." In partnership with EU GCCA+, the government of the Seychelles has produced a guide for hotels and guest houses.

Cook Islands: as part of a €14.89 million EU GCCA+ programme across the Pacific Ocean, a project is underway to restore coral reefs and tempt back tourists. The island of Aitutaki used to be famous for its brightly-coloured giant clams - known to the islanders as pa'ua - attracting scuba divers from all over the world. Older residents remember when clams were so plentiful they stretched as far as the eye could see. Now - thanks to an initiative involving local schools - a nursery has been established to breed Cook Islands native clams which are then transplanted to the coral reefs in specially protective cages.

Dominican Republic: It's another beautiful day in Miches on the northern coast of the Dominican Republic, and tourists are starting to return to the sun-drenched, pure white sandy beaches. But Miches - described by the New York Times as an "Instagram goldmine" - is still one of the poorest towns in the country, and locals don't always see the benefits from tourism. Yonattan Mercado, who has lived in Miches his whole life, now works for the government looking after two local nature reserves as part of an EU-funded programme to boost climate resilience. "They are home to dozens of wild species, but they

Palau: The tourism authority certainly doesn't hold back on the hype: "Lost in a great expanse of deep blue ocean, there lies a Barbados: Making tourism sustainable means taking care of the Pristine Paradise, one of the few remaining paradises on Earth."

Adaptation) programme, thirty schools have each adopted a beach to clean - with the results fed into the Big Microplastic Survev.

Maldives: As the poster child for climate-threatened SIDS, the Maldives ironically relies on long-haul tourism for a significant slice of its GDP - but transforming the sector to become more sustainable is challenging. Building on a previous €6.5 million wetlands conservation and coral reef monitoring project which ran from 2009-2015, the current EU GCCA+ €4 million programme aims to increase ecotourism and environmental protection in the south of the Maldives. Local mother-of-two Saheema is a frequent visitor with her children. "Since the nature park was created, the whole place looks better and cleaner," she says. "We love it and we often come here to snorkel. I am proud of having a place like this on my island."





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MOZAMBIQUE: THE FRAGILE EQUILIBRIUM BETWEEN TOURISM REPUTATION AND CLIMATE HAZARDS

Mozambique, in the south-eastern part of Africa, spreads its charms over 2 500 km of coastlines dotted with wild beaches, interspersed with lagoons, coral reefs and small islands. The Gorongosa National Park is considered as one of the top birding destinations in south-eastern Africa, as can be seen in the awardwinning National Geographic documentary, Africa's Lost Eden. At the same time Mozambique is the country most affected by climate related hazards according to the Global Climate Risk (CRI) Index, which uses data from the last 20 years.

In 2019, before COVID-19 pandemic, tourism contributed to 8.2 % of national GDP. There is a fragile equilibrium allowing Mozambique to reconstruct its reputation as a tourist destination. This reputation can be eroded due to climate change and the immense vulnerability of Mozambique to extreme climate events. In 2019 only, extreme climate events reduced GDP by 12.6 % and led to USD 4.9 billion of losses in monetary terms. This vulnerability is linked to its geographical location, its long Indian Ocean coastline and its location downstream of nine major river basins. Drought and flooding are the dichotomies representing the extreme exposure of Mozambique to climate change together with heat waves and cyclones.

As stated in Mozambique's National Adaptation Programme of Action, increased knowledge of appropriate adaptation



responses, tailored to different users, is needed to reduce climaterelated risks to human life and alleviate poverty. The government is working together with international donors to reduce flooding in major cities through new infrastructure programmes.

Building Local Climate Resilience in Mozambique, an EU GCCA+ funded project, is working to reduce climate-induced vulnerability at the local/district level by supporting the implementation of concrete actions from Local Adaptation Plans. However, these actions are not enough. The frequency and magnitude of extreme weather events are growing. Isolation and restrictions imposed by COVID-19 hampered a challenging situation at the local level and increased the vulnerability of local communities that were strongly affected in 2021 by Cyclone Chalane and Eloise.

UNICEF estimated that over 176 000 people in Central Mozambique were in a need of humanitarian assistance in the aftermath of Eloise. Prompt, robust and continuous support to the government and Mozambique's local communities is still required from the international community and donors. Local, regional and national stakeholders need to understand, foster and enable innovative climate-oriented solutions tailored to Mozambique's specific situation and aimed at promoting livelihoods, ensuring food security and creating jobs.





WOMEN FARMERS HOLD THE KEY TO A SUSTAINABLE FUTURE FOR SHEA TREES IN WEST AFRICA

On a remote farm in Oyo State, Nigeria, a group of women work the dusty fields, sowing maize, okra, spinach, tomatoes and other crops ready for the coming dry season. Dressed in brightly coloured clothing and headscarves, the women sing as they work in a scene typical of rural West Africa.

But the four hectare Oke Odo farm, located in the west not far from the border with Benin, is far from typical. The women here are planting their crops in the shade of shea trees, as part of a pioneering approach to sustainable farming. Together with women at a second farm, 500 km to the east at Tufa in Niger State, they are aiming to transform their lives and the future of the shea industry.

"Nigeria, along with other countries in West Africa, increasingly suffers from climate-related issues such as drought and deforestation which affect food production," says Cornelius Kakrabah, who heads up business development and programme implementation for the Global Shea Alliance (GSA). "Income levels and earnings from shea are relatively small but serve as a reliable source of income and contribute to family upkeep, health care, education and daily livelihood."

Shea butter is used in the production of food and cosmetics all over the world. Shea trees, which produce the nuts from which butter is extracted, grow across the dry Sahel region



of West Africa, and can produce nuts for up to 200 years. The trees are increasingly cultivated to supply a growing global market estimated by the World Business Council for Sustainable development (WBCSD) to be worth US\$2.9 billion by 2025. Demand for shea nuts from West Africa has rocketed by 600 percent in the last 20 years, but the women – and it is almost exclusively women – who collect the shea nuts are at the bottom of the value chain, typically earning around US\$75 a year for their labour.

Nigeria is the world's leading supplier of shea nuts, and it's estimated that around 2.2 million Nigerian women work as shea nut collectors. In an effort both to boost their livelihoods and ensure a more sustainable future for shea farming, a two-year, €245,000 EU GCCA+ funded project Developing A Resilient Shea Agro-forestry Farm Model is already being hailed as a success. Fifty-six women, drawn from local cooperatives, are being trained on the two model farms before passing their knowledge on to around 1500 women in the surrounding communities.

"The project was designed absolutely around women shea nut collectors," explains Cornelius. "The shea season only lasts from May to August, and after that there is very little work for them. This way they have work all year round, both during and outside of the shea season. They plant mixed crops on the same land where the shea trees grow. That gives them a livelihood all year round, and it's also better for conservation. The women are also taught beekeeping, which not only provides additional income but helps pollinate the crops."

According to one recent study, shea trees benefit from bee keeping because the insects distribute pollen between the shea flowers to produce fruit – but on farms with poor biodiversity, lack of pollination leads to low yields of fruit. By contrast, on sites with greater biodiversity such as the two model farms, more bees mean more pollination and more fruit. In addition, restoring the savannah parkland where shea trees grow helps combat the creeping desertification which threatens the Sahel.

Women shea nut collectors tend to belong to large, polygamous households, and in some states local laws and customs prevent them from owning their own land. Men are not generally involved in shea farming, yet the women are expected both to look after their children and pay for school fees and other expenses from the money they earn from shea nut collecting. "In economic terms, their entire lives revolve around subsistence farming and shea collection, that's their main economic activity. Some of them also work as small-scale traders, selling their crops in nearby markets," says Cornelius.



Link to the online story

WOMEN FARMERS HOLD THE KEY TO A SUSTAINABLE FUTURE FOR SHEA TREES IN WEST AFRICA

With the project well into its second year, results are looking positive. "I am absolutely encouraged by what we have achieved so far. The women tell us the impact on their lives is huge. There's a lot of interest, we're doing presentations to share what we've learned, and the sustainable agroforestry approach can be replicated over the whole of West Africa."

Key to the success of the project has been partnerships from across the shea value chain. Private sector companies, government departments and research institutions are all involved in both implementation and monitoring. Economic and environmental impact assessments are underway to measure the benefits for both the women and the land. The two model farms are also designed to fit into GSA's wider Action for Shea Parklands (ASP) initiative, which aims to replace the seven million trees lost annually across West Africa through climate change and land conversion.

"Shea trees are an endangered species in Nigeria," according to Ahmed Mohammed Kontagora, President of the National Shea Products Association of Nigeria (NASPAN). "The trees are cut down for construction, for charcoal and for firewood, and much of the land where shea used to grow has been deforested. We want to take back that land and plant shea trees so that communities can manage them and take ownership.

One of the biggest challenges is that people don't take ownership of the trees, but if they include them as part of an agroforestry farm, they will continue to protect them."

Despite the challenges, the model farm project in Nigeria shows how sustainable shea agroforestry can benefit both people are nature. "Shea farming has a very healthy future in West Africa," says Cornelius. "The women have been very enthusiastic right from the start. We held community consultations, we met with the community leaders, and the women were so excited that we were coming to their villages to get them involved and to train them. When they look back at what they have learned, it has exceeded all expectations. The future for shea trees is very bright across the whole of West Africa." That's a sentiment echoed by Khadijat Hassan, a member of Asumali cooperative in Tufa who was chosen to take part in the pilot. "We have been really impressed," she enthuses. "We've been able to accomplish many things – how to do mixed cropping so we can harvest more, and how to pass on our knowledge to other women. We will be able to take good care of our families and children, and support our husbands financially."

The future for shea trees is very bright across the whole of West Africa.





Link to the online story

WEST AFRICAN STUDENTS MASTER CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

"Climate change is one of the greatest challenges of our time and one of the most serious threats facing the entire international community," says Brou Isidore Kanga. "Access to climate information enables me to contribute to improving people's resilience."

44 year old Brou from Côte d'Ivoire is one of a new generation of West Africans who believe education is key to tackling some of the region's big climate challenges. In the past five years, 125 West Africans have graduated from the Master's in Climate Change and Sustainable Development (MCCSD) programme run by the AGRHYMET Regional Centre in Niamey, Niger, funded by the EU GCCA+ as part of its €12.1 million West Africa programme.

"Even before I started the course I was already studying the adaptation of agriculture and climate-dependent activities to the effects of climate change," says Brou, who graduated with honours and was the valedictorian of the 2019–2020 cohort, and who now heads the Research Department at the National Meteorological Directorate in Côte d'Ivoire. "The Master's in CCSD was an opportunity to strengthen my capacities to better fulfil my mission. The programme has allowed me to deepen my knowledge and adopt a more holistic approach."

The course includes modules on the science of climate change,

impact and vulnerability, adaptation, mitigation, international governance and negotiations, and communication and management. Students come from Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Guinea, Liberia, Mali, Mauritania, Niger, Senegal, Chad and Togo. Each of them must complete a final dissertation focusing on a climate change issue specific to their home country.

AGRHYMET – which is run by the Permanent Interstate Committee for Drought Control in the Sahel (Comité permanent inter-État de lutte contre la sécheresse au Sahel, or CILSS) – says the aim of the Master's degree in CCDD is to train high-level managers to both "value and capitalise on knowledge about climate science for vulnerability, impact and adaptation studies to climate change" and to integrate climate change into regional, national and local development plans, programmes and strategies. A key element of the programme is that graduates return to their home countries armed with the skills and knowledge to help them both tackle climate change locally and to empower them in international negotiations such as the UN climate COPs.

Thirty-seven year old Valerie Sounouke, from Cotonou in Benin, is another recent Master's graduate. "We all know that Benin is a less developed country, with a very poor population," says Valerie, who works as an agro-meteorologist at Benin's National Meteorological Agency. "Climate change is really a topical issue and the analysis of meteorological data, the use of climate models in relation to meteorological data, and the analysis of vulnerability are critical. We are still learning about these different approaches, and the Master's programme has brought a lot more to the table – such as how to organise participatory surveys, or how to use tools for analysing the evolution of carbon levels in agroforestry."

Valerie is also keen to put her international governance and negotiation studies to good use. "In the future, I hope to participate in large meetings on the issue of climate change," she says. "I enjoyed learning about the international climate negotiations during the COPs and the financial mechanisms that support the fight against climate change," agrees Brou.

With West Africa so heavily reliant on agriculture, it's not

surprising that many students focus on helping farmers to adapt and become more resilient. Cotton, sorghum, maize, niebe (peas), rice, nuts and cocoa are among the crops studied. "Cocoa farming is of huge socio-economic importance in Côte d'Ivoire, but future production is heavily threatened by climate change," says Brou. "I wanted to help cocoa farmers in the Daloa district become more resilient, so as part of my studies I surveyed 200 cocoa farmers in 12 villages, and met with four cocoa cooperatives and five partner organisations. Among my recommendations are training cocoa farmers in the use of climate services, capacity building for tree nursery production, revitalising the use of organic fertilisers, support for income diversification, index insurance and research into drought-resistant cocoa varieties."

With preparations for the sixth programme well underway, Brou is keen to encourage others. "The teachers are experienced professionals and experts who have a very good knowledge of their field," he says. "The lectures and classes allow students to research and present the results to their peers, and to exchange knowledge, and the study tour gave us practical experience in the field."





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DEFORESTATION-FREE SUPPLY CHAINS: A NECESSARY RESPONSE

The need to tackle 'imported deforestation' explains the growing interest in developing 'zero-deforestation' supply chains. The main cause of deforestation is the conversion of forests into agricultural land with monoculture tree plantations. In developing and emerging countries a significant share of converted land is used for producing export commodities such as cocoa, coffee, soy, beef, palm oil, pulp and paper, rubber or timber. So, importing products grown on deforested land indirectly encourages deforestation.

Through its external cooperation approach, the EU promotes integrated forest management measures that address the sustainability and legality of production and related value chains, while safeguarding biodiversity and local livelihoods. The approach encourages the scaling-up of deforestation-free supply chains by complementing trade-related measures with support for partner governments (e.g. on forest governance, land use planning, design of incentive measures and legality assurance systems), local producers (e.g. on production practices and compliance with certification requirements), and non-governmental organisations (as partners in advocacy and monitoring). Facilities, such as the EU Forest for the Future Facility, assist in providing technical support to contribute to healthy forest ecosystems and economic growth. The new EU Forest Partnerships will promote a holistic and integrated approach, including sustainable forest value chains and



deforestation-free agriculture, forest restoration, promotion of investments, governance and law enforcement, and civil society participation.

In recent years, the EU has developed a policy and regulatory framework (in progress) to support a shift towards deforestation-free commodity trade. This complements the existing EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan, which tackles illegal logging and trade of wood helping strengthen forest governance outside the EU, but does not address agriculture-induced deforestation.

Various mechanisms can support the development of deforestation-free supply chains. Private certification and voluntary labelling schemes, voluntary standards, user sensitisation and green procurement policies are increasingly used, but are insufficient to prevent deforestation on the required scale. Other options include a mandatory labelling scheme or a public certification of products associated with high deforestation risk; imposing stringent due diligence requirements on importers; and using differentiated taxes and duties to incentivise a shift towards deforestation-free production and consumption patterns.

The Regulation proposes country benchmarking (categorising countries into low, standard and high risk producing relevant

commodities that are not compliant with this regulation) combined with due diligence obligations for EU operators and traders (importers) of (initially six) deforestation-risk commodities, dependent on the risk level.

The GCCA+ initiative contributes to this through various projects, for example by supporting the development of a sustainable and inclusive rubber tree value chain in the Democratic Republic of Congo, sustainable coffee production and forest ecosystem conservation through integrated landscape management in Ethiopia, and sustainable and innovative agricultural value chains in the Brazilian Amazon.

The conservation of natural forests is strategically important for both climate change mitigation (considering their potential for storing carbon) and adaptation (given their role in regulating water flows and local climate, and supporting key productions, livelihoods and biodiversity).



EU GCCA+ THE ALLIANCE FOR A CHANGING WORLD



ABOUT EU GCCA+

informed, endeavour to make corrections.

The Global Climate Change Alliance Plus (EU GCCA+) is a flagship initiative of the European Union helping most vulnerable countries respond to climate change. It started in 2007 and has become a major climate initiative with over 80 programmes in Africa, Asia, the Caribbean and Pacific region.

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