POST PARIS NAVIGATOR SPECIAL REPORT 2020

FOCUS ON FORESTS – SHOWCASES, SUCCESS FACTORS & POLICY RECOMMENDATIONS

WITH FUNDING FROM
AUSTRIAN DEVELOPMENT COOPERATION

Imprint

brainbows informationsmanagement gmbh
Phone: +43 1 796 54 44
www.brainbows.com
navigator@brainbows.com

www.schwarzeneggerclimateinitiative.com

Vienna, June 2020

EDITORIAL

Dear readers,

"flatten the curve" has become the motto of 2020. Following last year's impressive climate action momentum, achieved by millions of young people around the world, one would have expected this slogan to refer to carbon emissions. But the coronavirus pandemic – anticipated by some experts for a long time – suddenly shifted the focus of the global community from one crisis to another.

Yet, the two global phenomena have a lot in common and their causes are closely linked: Many experts blame humanity's destruction of ecosystems and biodiversity for the emergence and transmission of new diseases. Major landscape changes, uncontrolled urbanization and specifically the disruption of pristine forests are causing animals to lose their habitats. This means many species must share less space and therefore come into even closer contact with people. Conservation and rehabilitation of natural landscapes such as forests, grass- or wetlands – and intact ecosystems in general – thus contribute to both: a healthy planet and healthy people.

Our 2020 Special Report – the third in this series already – features a broad variety of international showcase projects and sustainable business models that contribute to intact forests in very different ways. The showcases range from conservation and reforestation initiatives, to forestry and construction projects, to the fashion and tourism sectors, as well as capacity building and financing etc. In the context of our Post Paris Navigator initiative, supported by the Austrian Development Agency, we carefully selected projects which benefit both climate and people in developing and emerging countries. Each of the project examples presented on the following pages discusses local impacts and benefits as well as important enabling factors. To complement this, fact boxes and additional information on forest-related topics are provided throughout the report, as well as general success factors and policy recommendations derived from the projects.

This report is intended to serve as a source of inspiration to other project developers – since there are many good solutions out there already that only need to be replicated and scaled. We cannot let the corona crisis prevent us from fighting for a cleaner and healthier environment! Meeting the internationally agreed climate and development goals requires urgent action! If the corona crisis has made one thing clear, it is that transformational change is possible. We need to learn the lessons from this test case: listen to the experts, act early and reduce global dependencies in favor of a more regional circular bioeconomy based on local renewable resources and energy. Post-corona recovery investments must be guided towards this resilient, low-carbon economy of the future.

These thoughts and approaches are also going to be the main focus of the AUSTRIAN WORLD SUMMIT 2020, taking place in Vienna on September 17th. With Arnold Schwarzenegger as host and founder, under the patronage of the Austrian Federal President Alexander Van der Bellen, and with the support from our leading partner FOR FOREST, the role of forests for a healthy planet will feature prominently on the conference agenda.

Monika Langthaler
Director of the Schwarzenegger Climate Initiative

TABLE OF CONTENTS

INTRODUCTION

Trees and forests are not only critical for the earth's climate and biodiversity; they also provide essential services for people's livelihoods. Particularly in the Global South, people depend heavily on intact forest ecosystems. On the one hand, these contribute crucially to people's health by providing clean air and water, protection against floods, landslides, desertification etc. On the other hand, especially rural people often participate in forest value chains, by for example collecting fuelwood or animal fodder for personal use or sale. Of the people living in extreme poverty, over 90% are dependent on forests for at least part of their income.

At the same time, much of the observed loss in global forest cover also occurs in developing and emerging countries, particularly in sub-Saharan Africa, Latin America and Southeast Asia. These regions play a crucial role in forest conservation and rehabilitation efforts by politics, NGOs and private actors. Also with a wider view on the global challenges of climate change and sustainable development, the countries of the Global South are key – since they are particularly affected, while frequently lacking effective means.

Companies and organizations from more economically advanced nations can contribute substantially to a climate-resilient development of these regions through appropriate technologies, know-how transfer and financing for sustainable projects on site. Learning from successful examples and encouraging replication is crucial for accelerating this process in order to reach the internationally agreed goals of the Paris Climate Agreement and the UN Sustainable Development Agenda. Thus, brainbows and the Schwarzenegger Climate Initiative regularly welcome the submission of innovative projects related to developing and emerging countries, which deliver a positive climate impact. Entries from across the world are evaluated by project developers and experts before the identified best practices are summarized in a white paper for stakeholders and presented at the annual AUSTRIAN WORLD SUMMIT and made available on **www.schwarzeneggerclimateinitiative.com**

This year's call focused on projects contributing to the conservation, rehabilitation and sustainable management of forests. The submissions were evaluated with regard to their degree of innovation, replicability, social and climate impact, as well as their contribution to the UN Sustainable Development Goals (by definition, all contribute to SDG13 – Climate Action). The showcases were selected to represent a variety of different approaches and sectors. Ten on-site projects are presented in greater detail, including their specific developmental impacts and enabling factors. These are complemented by five additional instruments that benefit forests in a broader sense. Apart from development cooperation, academic and other non-profit initiatives, many of the featured examples are for-profit projects – because in order to reach the internationally agreed goals the private sector will be much needed. The following pages shall highlight these positive examples and encourage replication by others.

Post Paris Navigator –
A climate project facilitator for companies

brainbows, the organizer of the annual AUSTRIAN WORLD SUMMIT, initiated the Post Paris Navigator in 2017 as an information and matchmaking platform for Austrian green tech companies interested in the realization of sustainable, climate-resilient projects in developing and emerging countries. The aim of this initiative is to raise companies' awareness of climate action and speed up project implementation by matching relevant actors and facilitating successful entries into new markets. For that purpose, brainbows established a networking community which shares knowledge and experience, while providing information about the global climate change process and success factors of projects.

The initiative is supported by the Austrian Development Agency (ADA) and realized together with the Austrian Economic Chambers (WKO AUSSENWIRTSCHAFT AUSTRIA). Companies, development organizations and other parties interested in Navigator events may refer to **navigator@brainbows.com**

FOCUS ON FORESTS

Forests cover 31% of the global land area. In total, this is 4.06 billion hectares or about 5,000 m^2 per person; but more than two-thirds of this area are found in only ten countries. Approximately half of the world's forest area is relatively intact, and more than one-third is primary forest. Growing demand for agricultural and forest products is leading to the loss of 13 million hectares every year – an area the size of Greece. Since forests are home to most of the terrestrial biodiversity, this has severe repercussions on a wide range of species.

Forests provide habitats for about 80% of the world's amphibian species, for 75% of all birds, and 68% of mammals. Of the 60,000 known tree species, a third have been included in the IUCN Red List of Threatened Species.

Forest functions

Apart from their conservational and recreational value, the world's forest ecosystems provide critical and diverse services to society and economy. Intact forests produce clean air and water, conserve soil and stabilize stream flows and water runoff – thereby preventing land degradation and desertification and reducing the risks of natural disasters such as droughts, floods, and landslides. Moreover, forests provide the basis for a vast number of products and value chains, including food production, fibers and textiles, construction materials, energy sources, traditional and modern medicines etc., as well as services such as tourism. Many people in both low- and high-income countries and in all climatic zones therefore generate subsistence and income from trees and woods.

Globally, more than 1.6 billion people depend on forests for their livelihoods. Of these, some 350 million - half of whom are indigenous - live within or close to dense forests depend almost entirely on forests for subsistence.

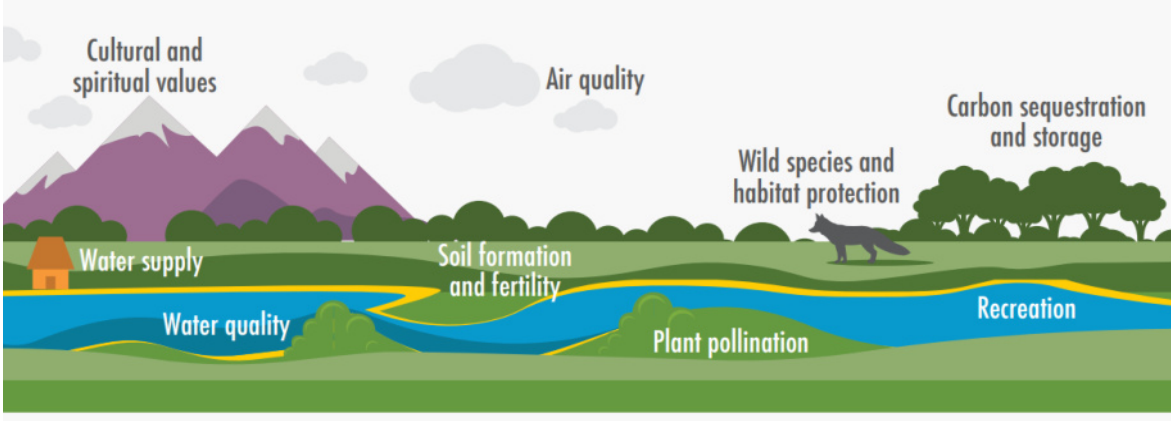
An estimated 9% of the world's rural population is lifted above the extreme poverty line because of income from forests. In addition, the vulnerability of these poor households is mitigated through the diversification of their income sources thanks to forest resources. Trees and non-wood forest products thus largely contribute to poverty eradication and economic development.

Forests' importance for the climate

Forests also play a key role within the global carbon cycle, removing carbon dioxide (CO_2) from the atmosphere and converting it to wood as they grow, and releasing it back into the atmosphere when trees are burned or decay. Thus, the forest and land-use sector can act as either a source or a sink for carbon.

Forests currently absorb 2.6 billion tons of CO_2 each year, equivalent to about a third of the amount released annually by burning fossil fuels. At the same time, deforestation contributes about 10% of global greenhouse gas emissions and represents the second-largest source of annual CO_2 emissions.

Halting deforestation and forest degradation and encouraging replanting or sustainable forestry management practices could potentially contribute over one-third of



Important ecosystem services provided by intact forests and healthy landscapes (Source: Forest Trends, Washington D.C.)

the total emissions reductions that scientists say are needed by 2030. Such "natural climate solutions" are often more economical than technical solutions – and through their ecosystem services provide additional benefits.

Threats

Since 1990, it is estimated that 420 mio. hectares of forest have been lost through conversion to other land uses.

The causes of deforestation and the unsustainable use of forests are diverse and differ from region to region. While forests are being cleared in the Brazilian Amazon region in order to create space for the cultivation of soy and livestock by large multinational corporations, in Africa excessive removal of firewood and slash-and-burn to create arable land are primarily responsible for forest loss. In Southeast Asia, the production of wood, palm oil and further non-sustainable agricultural practices are major causes. Behind these direct drivers of deforestation are often indirect causes such as inadequate governance, poor enforcement of land use policies and unclear ownership.

Common effort to restore the world's natural ecosystems

Due to the fact that forests as well as large parts of other natural landscapes have come under tremendous stress, the United Nations proclaimed 2021–2030 as the Decade on Ecosystem Restoration. There have been several political initiatives and commitments in recent years: The so-called Bonn Challenge aims to restore 350 million hectares of degraded land by 2030; at the 2019 Climate Action Summit in New York many individual countries announced new pledges to restore forests and plant trees; and in early 2020 the World Economic Forum launched an initiative to grow, restore and conserve 1 trillion trees worldwide. The United Nations' strategic framework for all actions to maintain and sustainably manage the diverse types of forests are the six Global Forest Goals with their 26 associated targets. They aim to strengthen and contribute to the seventeen internationally agreed Sustainable Development Goals, which are to be reached by 2030.

New opportunities

Yet, rehabilitation and conservation of natural forests and other land ecosystems alone will probably not suffice to conserve biodiversity. Nature reserves usually contain only a fraction of existing forest biodiversity, they may create barriers to species migration and are vulnerable to factors such as climate change. This means that there is a need to look beyond protected areas and to mainstream biodiversity conservation into all forest management practices. There are many ways to manage forest ecosystems that ensure the conservation and sustainable use of their biodiversity and ecosystem functions – some of them are displayed in this report. In any case, to meet the internationally agreed goals and reach net-zero carbon emissions, our economy will need to be fundamentally transformed – from fossil-based to bio-based. The circular economy of the future will thus rely strongly on wood, natural fibers and other products derived from trees – which also provides great economic opportunities for these kinds of business models.

The seventeen United Nations Sustainable Development Goals (UN SDGs) to transform our world

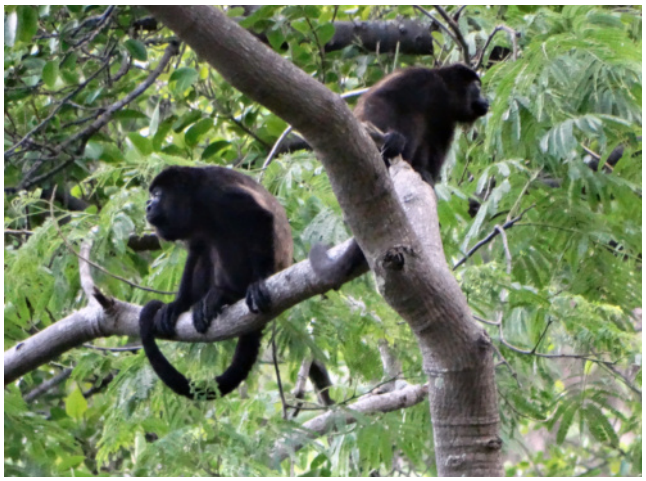
PRIVATE NATURE RESERVES, NICARAGUA

A private initiative contributing to the public cause by implementing and catalyzing conservational activities in Nicaragua's primary and secondary forests

The Project

The Foundation for the Development of Private Nature Reserves in Nicaragua (Red de Reservas Silvestres Privadas, Red-RSP) was founded in 2001 by the owners of the first six private nature reserves approved by the Nicaraguan Ministry of Environment. Over the years, the association has grown to 48 members representing more than 140 private reserves which have become part of the National System of Protected Areas (SINAP). Although private, they contribute directly to a public purpose by conserving, protecting and restoring the natural resources in their local environments. The foundation maintains Nicaragua's natural and cultural heritage, develops a model with ecological, economic and social responsibility and improves the living conditions of the surrounding population. It promotes innovative ways for local actors to generate income, improves their quality of life and increases the sustainable use of natural resources.

Red-RSP also works as a catalyst for nature conservation in Nicaragua. Its efforts have an impact far beyond the reserves' limits as it is able to mobilize people for nature conservation and build active relationships with environmental organizations and universities. It also promotes research, documentation and dissemination of voluntary conservation.



Impacts & Benefits

While many of Nicaragua's public nature reserves gradually die a slow death from illegal logging, the private Red-RSP network has achieved important conservational work. In total, more than 11,000 hectares of primary and secondary forests are being protected and conserved. Their capacity to absorb and store tens of thousands of tons of carbon dioxide increases by about 10 percent each year.

Hand in hand with the preservation of woodland and water catchment areas goes the protection of the country's unique biodiversity. Thanks to active dialogue and joint initiatives with neighboring actors, habitats and ecosystems are preserved even outside the protected areas in five so-called biological corridors through which e.g. migratory birds can move from north to south and vice versa. In addition, howler, capuchin and the endangered muriqui monkeys as well as cougars are being reintroduced in the nature reserves – iconic species that are invaluable for the future of Central America's flora and fauna.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

Enabling Factors

In Nicaragua there are no direct subsidies from government agencies for the conservation of forests, biodiversity, water sources and corresponding initiatives. Also on the international carbon market there are very limited financing opportunities for conservational projects (in contrast to e.g. afforestation or plantation projects). Establishing Nicaragua's private nature reserves therefore has been an effort by a few people believing in voluntary conservation who devoted part of their property to this cause, supported by a staff of scientists, volunteers and development cooperation organizations such as the Austrian HORIZONT3000. The success of the initiative can be attributed to their personal will and dedication combined with a certain entrepreneurial approach to develop touristic and other marketing activities covering part of the costs and generating local income in the reserves.

RED DE RESERVAS SILVESTRES PRIVADAS
CÁMARA DE CONSERVACIÓN ECOLÓGICA DE NICARAGUA

Submitter: Cámara de Conservación Ecológica de Nicaragua (Cámara Red-RSP)
Location: 142 private nature reserves across Nicaragua
Website: www.redrsp-nic.org
Contact: direccion.ejecutiva@reservasilvestres.com

Economic value of intact forests

Apart from the indirect economic benefits that intact forests provide, e.g. through their ecosystem services such as flood prevention, carbon sequestration or the provision of clean air and water, they are also of great direct value that can be used for touristic and other services as well as in a range of different products. Marketable forest products apart from timber and firewood (which in nature reserves are prohibited to extract) are for example edible wild food such as berries, nuts and mushrooms, medical plants, spices and resins, fibres or grass for furniture, clothing, bio-plastics or briquettes, as well as agro-forestry products such as coffee, cocoa and honey.

In the service sector touristic and educational activities prevail. For example, Red-RSP members generate revenues from entrance fees, accomodation, guided tours for adventurists as well as academics studying the forest wildlife, and through the educational program Aula Verde for school children, universities and individual visitors.

To support the development and implementation of such sustainable business initiatives, Red-RSP helps to coordinate activities e.g. through "Circuitos Tourísticos", and together with HORIZONT3000 supports the advancement of small businesses through "Coemprendimientos", a novel way to bring together owners of private nature reserves and local actors with experiences on alternative products and services.

REFORESTATION OF THE ETHIOPIAN HIGHLANDS

Science-based pilot project to replicate and restore Ethiopian community forest remnants as species-diverse habitats and sustainable income sources

The Project

For many decades, the primary forests that used to cover the northern highlands of Ethiopia have been reduced to about three percent of its original size by the expansion of agricultural activities and a growing population. Most of the remnant ecosystems survived as small, scattered forest fragments with around 3-20 hectares which have been protected by local Ethiopian Orthodox churches for centuries. To reach a national forest cover of about 30 percent again and obtain climate neutrality, the Ethiopian government has the ambition to restore 20 million hectares of currently degraded land by reforestation within 30 years.

While most afforestation efforts in Ethiopia are carried out with non-indigenous species such as eucalyptus, a project by the University of Natural Resources Vienna (BOKU) aims to develop species-diverse forests that replicate and restore the natural forest remnants of the highlands. A previous BOKU project comparing different local land-use types showed that the biodiverse church forests stored specifically high amounts of carbon, particularly in soils.

Based on these and other scientific data and analyses, the project realizes three pilot plantations to develop best practice methods for afforestation of degraded highlands with a mixture of indigenous tree species.

The aim is to develop replicable forest systems with multiple uses which in the short term produce a constant and sustainable income stream for farmers, and in the long term make a major contribution to Ethiopian climate targets. Thus, the tree species in use were carefully selected on the basis of traits such as growth rate, light requirements, position in ecological succession, leaf and root morphology, symbiotic associations etc. as well as on their commercial value and acceptance by local farmers.

Impacts & Benefits

The innovation within the project is the changed approach in regards to planning forest as permanent structures, not as short rotation plantation of a few years. The resulting near-natural forest ecosystems will provide important services such as carbon sequestration, clean water and habitats for pollinators, birds and other animals on the one hand, and on the other social benefits to the local communities to whom the restored forests belong.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

They will produce a constant intermediate harvest in the form of fodder for stock feeding from herbaceous plants, and later a woody supply from the thinning of fast-growing nurse trees, while allowing the long-term development of the target tree mixtures.

Community involvement is another major aspect of the project. This is included in both the planning and planting as well as the later management of the forests. In addition, a contribution is made to knowledge transfer and improved education through implementation of forest management courses at Bahir Dar University.

Enabling Factors

Central enabling factors for the realization of the project are its scientific base and especially its rootedness in a previous BOKU project to determine suitable tree traits, as well as the funding by the Austrian Ministry of Environment. Notwithstanding that Ethiopian Government planting schemes count the number of seedlings planted, irrespective of their survival, it turned out that this posed the main challenge for the project's implementation. The most important lessons learned were that keeping the tree seedlings alive after planting does not only require physical barriers such as fencing to prevent pasturing, but also a very strong community involvement. Thus, finding agreement and support of local communities became the decisive breakthrough moments for the project.

Submitter: University of Natural Resources Vienna (BOKU)
Location: Bahir Dar, Ethiopia
Contact: douglas.godbold@boku.ac.at

Biodiversity and resilience

An ecosystem's resilience or robustness is its capacity to respond to a disturbance – be it a natural event or human influence – by resisting damage and recovering quickly. This ability to continue maintaining the system's ecological processes and functions depends very much upon the diversity of species it hosts – because the greater the number of different species and varieties, the higher the chance of any one of them having traits that enable them to adapt to a changing environment.

Forest biological diversity encompasses not just different trees species, but the multitude of plants, animals and micro-organisms that inhabit forest areas and their associated genetic diversity. Research shows that more diverse forests are able to sequester and store more carbon dioxide from the atmosphere. Declining biodiversity, on the contrary, makes forests less resilient to withstand threats such as extreme heat, drought, insect pests and other phenomenons becoming ever more frequent with climate change.

While biodiversity loss creates a negative-feedback cycle creating even more loss of biodiversity and resilience of the system, a balanced and diverse forest ecosystem creates benefits far beyond its boundaries and increases also people's resilience against natural events and climate change: Forest services such as enhanced food and water security, increased community incomes, erosion control etc. are of great importance particularly for people in developing and emerging countries.

TRANSFORMING DEGRADED LAND INTO PRODUCTIVE AGROFORESTRY SYSTEMS

Nature-based solutions and circular economy business models enabling land rehabilitation in the Mediterranean region

The Project

Semi-arid climate zones such as the Mediterranean region have always been struggling with natural water scarcity during summer months. With climate change advancing, particularly coastal regions are confronted with extended heat periods, stronger winds and erosion, altogether leading to land degradation. Water as the strongest limiting factor for agriculture, forestry and other land uses becomes especially scarce where there is also heavy touristic activity.

In order to preserve natural water loops and halt land degradation in the Mediterranean region and beyond, an international cooperation between 27 partners focusing on innovative and nature-based water management and water treatment solutions was formed in 2017. In the so-called HYDROUSA project, financed by the EU Horizon 2020 Research and Innovation Program, they developed and implemented a set of easily adaptable solutions for problems such as water supply, wastewater management, nutrient and biodiversity loss in Greece – with the aim to replicate these in other semi-arid regions around the world. The project, running until 2022, addresses four different water sources – rain water, atmospheric humidity, waste water, and sea water – and treats them with different nature-based solutions (NBS) such as constructed wetlands, saltwater evaporation, rainwater harvesting or sand filtration systems. Building upon the preserved water and nutrient resources, sustainable business models including agroforestry, tropical greenhouses and eco-tourism are being developed.

Impacts & Benefits

Agroforestry systems – i.e. the intentional combination of agricultural crops with trees and shrubs - are a recognized means to not only increase biodiversity, but also to reduce erosion by retaining soil and avoiding water depletion. Thus, for arid and windy coastal regions agroforestry is a specifically well-suited production type, creating vegetation where there used to be rocks and stones before.

As one of HYDROUSA's demo projects, one hectare of land on the island of Lesvos is transformed into a biodiverse agroforestry system, using reclaimed water from another demonstration site: Nutrient-rich water from a nearby sewage treatment plant, which combines anaerobic processes with constructed wetlands and disinfection

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

in a completely circular solution, will feed the plants through different irrigation systems (drip and stone channels). Co-creatively elaborated with the local population, the agroforestry system will host forestry trees for fruit and timber production, orchards and bushes as well as herbs and several local varieties of vegetable crops. Fruit trees will be used as wind protectors and shade providers, shrubs as providers of superfood such as goji berries, and aromatic plants for essential oil production.

Apart from the direct positive effects to local wastewater management, employment and erosion control, the project also contributes to resource efficiency and climate protection through reduced shipping of water, fertilizer and food.

Enabling Factors

HYDROUSA is based on traditional handcraft and ancient technologies combined with modern NBS and a reasonable level of ICT technology and automation. Global replication of these innovative, nature-inspired solutions as well as inter-regional collaboration are central goals of the project, and thus covered by many actions such as regular events, workshops and active communication through the project's own website and social media channels.

So far, HYDROUSA has received more than 140 letters of interest from potential replication sites around the world. Transferability of the developed solutions will be demonstrated in 25 other Mediterranean countries, including Egypt, Palestine, Lebanon, Morocco and Tunisia, as well as in several other water-stressed rural or peri-urban areas, e.g. in Mexico, Chile, Malaysia or Argentina.

Submitter: Alchemia Nova
Location: Lesvos/Tinos/Mykonos, Greece
Website: www.hydrousa.org
Contact: info@hydrousa.org

Nature-based solutions

There is growing recognition and awareness that nature can help provide viable solutions that use and deploy the properties of natural ecosystems and the services that they provide in a smart, "engineered" way. Through this sustainable management and use of nature, socio-environmental challenges such as climate change, water security, water pollution, food security, human health, and disaster risk management can be addressed effectively and long-term.

The European Union defines Nature-based Solutions (NBS) as "solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions".

Whether natural, managed or newly created, circular NBS such as the one's demonstrated in the HYDROUSA project not only tackle acute problems, but also provide a lasting basis for new sustainable business activities.

RESTORING MANGROVES IN MADAGASCAR

The search engine Ecosia uses its profits from ad revenues to plant trees where they are needed the most

The Project

Ecosia is a free search engine and a certified social business based in Berlin, Germany, that devotes itself to reforestation projects in biodiversity hotspots worldwide. By donating over 80% of its profits – derived from clicks on online advertisements – to nonprofit partner organizations, the company finances a newly planted tree every 0.8 seconds on average. One of Ecosia's biggest reforestation projects is located in Madagascar:

The world's oldest island is home to over 200,000 species that don't exist anywhere else in the world. But 90% of the island's forests and mangroves as their natural habitats have been destroyed due to burning for grazing or cut-downs for wood and charcoal by the local population who live in extreme poverty. A high degree of corruption and weak public institutions add to the problem. Ecosia's planting partner Eden Reforestation focuses on restoring mangroves along the northwestern coast and planting deciduous trees slightly further inland to reconnect remaining forest patches. In total, 35 million trees have been planted and 3,500 hectares of land restored since 2016.

Impacts & Benefits

Mangroves are one of the world's most effective absorbers of CO_2 – and at the same time amongst the most vulnerable ecosystems to the threats of climate change and rising sea levels. They do not only host many endemic tree and bird species and a diverse aquatic ecosystem, but also protect coastal communities from storms and floods. This prevents the soil from washing into the sea, which also keeps sediments away from coral reefs and seagrass beds. Therefore, their restoration has a multitude of positive direct effects both for fauna, flora and the local population.

Upcountry, where Ecosia supports the planting of narrow corridors to connect natural forest remnants, another series of positive effects are set in motion. Thanks to these corridors, animals such as the endangered lemures are able to roam from one patch of forest to another when foraging for food or searching for mates. While doing so, they also carry pollen and seeds to new areas and thereby contribute their part to the revitalization of Madagascar's forests.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

Enabling Factors

Ecosia only plants trees in deforested areas where trees used to grow naturally – this ensures that the area offers an environment where the seedlings can actually thrive. When restoring an ecosystem, the natural succession path of native species is followed, as that is the most effective way to get to a new forest eventually. Exceptions for non-native species are made only for non-invasive fruit or nut trees in mixed agroforestry systems that provide additional income and food for local communities.

Critical for the success of the reforestation measures is that people in and around the project area understand the benefits the trees bring – which can be a change to the earlier situation that caused the trees to disappear. Trees are planted only where people want them in the first place and where there are no adverse incentives to fell them later on. In addition, the trees are tracked for at least three years, using satellite technology, a monitoring app, geotagged photos, independent auditors, and field visits.

Submitter: Ecosia GmbH
Location: Madagascar
Website: blog.ecosia.org/madagascar
Contact: info@ecosia.org

Protective function of forests and mangroves

Forest ecosystems can play a crucial role in disaster risk reduction, acting as a natural buffer to prevent or mitigate natural disasters which threaten property and life. By absorbing rainfall and stabilizing land, intact forest ecosystems act to prevent flooding and landslides - which can be particularly deadly where forests have been cleared on hillsides above human settlements.

Mangroves - a type of coastal forest ecosystem - play a critical role in weakening the power of storm surges in hurricanes and tropical storm events, limiting the extent of coastal flooding. This serves to reduce the risk of injury or death to coastal residents and limits the severity of property damage that may have occurred had the mangrove forests not been present.

Estimates suggest that natural disasters caused by anthropogenic ecosystem disruption already cost the world more than US$ 300 billion per year. Protecting forests ecosystems will only become more important in limiting this damage and disruption as climate change, population growth, and land degradation act as threat multipliers - likely increasing the frequency and severity of natural disasters in years to come.

RESPONSIBLE PLANTATION MANAGEMENT IN SOUTH AFRICA

Sustainably managed forestry plantations contributing to wetland conservation and landscape stewardship on a large scale

The Project

Initiated in 1991, the WWF-Mondi Water Stewardship Partnership, incorporating the WWF-Mondi Resilient Landscape Approach, is one of the longest running conservation programs in South Africa. What started out as wetland management activities in isolated forestry plantations outside protected areas has been expanded over the years to work at a landscape scale, catalyzing conservation and restoration efforts not only in the forestry industry, but across multiple land uses, including the agricultural sector. The partnership brings together key stakeholders from business, government, local communities and environmental organizations who have a shared interest in landscape stewardship and social-ecological resilience.

Since 2001 Mondi, a leading packaging and paper company with forestry landholdings in South Africa and Russia, has been the primary funder of the program. The World Wide Fund for Nature (WWF) South Africa manages the funding and the staff who work for the partnership.

Impacts & Benefits

The comapny is committed to implement, develop and promote a "new generation of plantations" that maintain ecosystem integrity, protect and enhance high conservation values, are developed through effective stakeholder involvement processes and contribute to economic

growth and employment. The eucalyptus plantation realignment and withdrawal of commercial trees from wetlands in the iSimangaliso Wetland Park World Heritage Site on the east coast of KwaZulu Natal is one showcase example of how both local ecosystems and stakeholder trust can be restored and how productive plantations can be sustainably managed within a wildlife park. Today, the plantations form an important buffer between the park, local communities and commercial farming areas, protecting the park's freshwater flows and wild animals from encroaching development.

In addition, the WWF-Mondi Water Stewardship partnership works with multiple industry value chains, starting from the bottom with producers, processors etc., thereby improving local livelihoods and relations with the community, e.g. by employing and training previously unemployed people to restore degraded wetlands. Mondi Zimele, the small business development arm of Mondi in South Africa, adds value through making available equity,

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

loans and business development support to job creation through small businesses along the company's value chain and surrounding communities.

Enabling Factors

The program approach worked because it was co-created by the forestry industry, environmentalists and the government. The long development process allowed the different parties to build a relationship of trust and mutual respect, which were vital for the strong collaboration.

By employing an innovative social learning approach, the partnership furthermore demonstrates that isolated good practices by individual actors is not enough to address the complex challenges related to landscape stewardship. It exemplifies that dialogue and collaboration at a catchment level, developing a common understanding among partners, knowledge exchange and transformative learning are essential ingredients to co-constructing successful solutions where no one organization has the answer.

Submitter: WWF – New Generation Plantations
Location: South Africa
Website: wwf.panda.org/get_involved/partner_with_wwf/corporate_partnerships/who_we_work_with/mondi_group
Contact: andrew@andrewheald.com

WWF | SUSTAINING ECOSYSTEMS THROUGH RESPONSIBLE BUSINESS PRACTICES | mondi

New Generation Plantations

As fossil fuels and other non-renewable resources are being phased out and ever more innovative applications and energy uses for wood and other forms of biomass emerge, the demand for wood and materials derived from it – such as fibers and fabrics, but also bioplastics and fuels produced in "biorefineries" – will increase significantly. To meet this growing demand, plantations will be indispensable to provide the renewable and recyclable raw materials forming the basis of a circular bioeconomy. It is therefore all the more important that these plantations are managed responsibly. Well-managed plantations in the right places can help conserve biodiversity and meet human needs, while contributing to sustainable economic growth and local livelihoods.

Thus, WWF set up the New Generation Plantations (NGP) platform as a place to learn about better plantation management through real-world experiences, and influence others to follow good examples. The platform enables shared learning on a global scale, both through events such as study tours, workshops and conferences, and through its website **www.newgenerationplantations.org**

FAIRTRADE AGROFORESTRY PRODUCTS FOR FOREST AND CLIMATE PROTECTION

Austria's Fair Trade pioneer EZA Fairer Handel imports organic coffee from small-scale agroforestry producers in Mexico and Uganda

The Project

The use of wooded land for the cultivation of crop plants or the planting of trees on farmland – called agroforestry – provides many ecological and economic benefits. In addition to increased biodiversity, improved nutrient cycles and erosion control, several plant species such as coffee, cocoa and exotic fruits specifically benefit from the shade and wind protection provided by surrounding trees. On the other hand, agricultural practices in accord with intact woods help relieve the pressure on forest ecosystems.

The Austrian Fair Trade pioneer EZA Fairer Handel has created a new coffee brand that not only contributes to the conservation of forests and ecological buffer zones next to protected areas, but also supports direct climate action. This "Coffee for Future" combines organically grown Arabica highland coffee from small farmers' cooperatives in Mexico and Uganda with additional on-site climate measures that are financed by an EZA climate premium.

The members of the partnering Mexican farmers organization SPOSEL cultivate their coffee bushes under shade trees on the edge of the Selva Lacandona, a species-rich jungle area in the rather poor rural state of Chiapas. The smallholder families strengthen the sensitive ecosystem by diligent care of their parcels and active reforestation. Apart from coffee, the parcels hold a broad variety of

different trees and organically grown crops including oranges, bananas, ananas, Pacaya palms and chili. The BOCU cooperative from Uganda at the foot of the Rwenzori Mountains is also committed to the careful use of natural resources. Besides organic mixed farming of coffee, bananas, manioc and sweet potatoes, amongst others, the cooperative builds efficient cooking stoves, which reduce firewood and coal consumption and at the same time lower smoke emissions in households.

Impacts & Benefits

While world market prices for coffee fluctuate considerably and barely cover the production costs of peasant farmers, the EZA's partner cooperatives receive a fair and guaranteed minimum price plus premiums for the high organic bean quality, social or technical investments and additional climate measures. In Chiapas, the farmers collectively decided to use the "climate premium" to reforest 300 ha of land in order to further diversify their shadow plants and strengthen ecological corridors. In Uganda, already more than 400 wood-saving stoves have been built and 15 young people trained to install more of them in the coming years.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

The benefits of this initiative are threefold: Natural forests are preserved, additional climate measures realized, and the livelihoods of the rural, mainly indigenous population are bolstered. By providing them with reliable and fair trade channels as well as training in agricultural techniques including organic fertilization and biological pest control, the coffee cooperatives capacitate their members and generate a lasting local impact.

Enabling Factors

Having been practicing an alternative way of trading since 1975, EZA's partnerships are based on transparency and solidarity, open-mindedness and fairness. Fair Trade is meant to empower the people behind products. This includes active involvement of the producers, their needs and experiences, support of their cooperatives, and access to further training.

Furthermore, in order to improve the living and working conditions of disadvantaged producers in the countries of the Global South, also consumers and decision makers in the North need to be sensitized for product origin and trade justice. This happens through personal exchange and awareness raising activities in Austria – made possible also thanks to partners such as the movement of Worldshops and the non-profit climate protection network Klimabündnis Österreich.

EZA

Fair für mich.
Fair für alle.

Submitter: EZA Fairer Handel & Klimabündnis Österreich
Location: Chiapas/Mexico, Kasese/Uganda
Website: www.eza.cc/coffee-for-future
Contact: office@eza.cc

Klimabündnis Österreich

Preserving indigenous livelihoods

The livelihoods of local communities living in and from natural forests – particularly the indigenous peoples of Latin America – depend strongly on intact environments and are specifically vulnerable to land degradation and climate change. These communities contribute greatly to the preservation and restoration of forest ecosystems, e.g. through traditional agroforestry, beekeeping or fish farming. Understanding and support for indigenous lifestyles and rights are therefore an important factor in the global efforts to stop climate change.

The Climate Alliance Austria (Klimabündnis Österreich), being actively engaged in a long-running partnership with indigenous organizations in the Brazilian Rio Negro region, has been working since the early 1990s to sensitize and connect hundreds of cities, municipalities, schools and enterprises across Austria with indigenous people from South America. In line with the motto "think global, act local", constant communication and regular exchange has strengthened understanding for the other cultures and for the interconnections between rainforest destruction and consumer behavior. In addition, the partners on site have been receiving political, financial and in-kind support to safeguard indigenous land rights, culture and lifestyles – and thereby to foster biodiversity, food security, sustainable resource management and political participation.

TRADITIONAL AFRICAN CRAFTMANSHIP REFINING TREE FIBERS FOR FASHION

A French shoe fashion start-up replaces synthetic materials with natural fibers and other materials derived from trees

The Project

Umòja, which means "unity" in the Swahili language, is a footwear brand that combines tradition, modernity and innovation while promoting African textile craftsmanship and respect for people and the environment. In 2018, the French start-up was founded to offer credible alternatives to shoes made from synthetic materials – and initiate reflection on the social and environmental impact of the fashion industry. The founders aim to reintroduce the use of natural, innovative and bio-based fibers and thereby preserve and improve traditional African textile crafts.

The brand excludes the use of animal leather and artificial dyeing. Whereever possible, natural and particularly tree-based materials are used: This includes textiles made from tree bark, raffia, cork and banana tree fibers as well as organic cotton and rubber. For dyeing and painting, mineral and vegetable materials such as leaves, roots, bark, clay and stones are used – each time resulting in slightly varying, unique pigmentations.

All the natural materials are produced by local entrepreneurs and small cooperatives in the Ivory Coast, Mali, Burkina Faso, Senegal, and Uganda and are sourced directly from the artisans. Shoe production is situated in

Portugal, ensuring transparent working conditions and traceability of the used materials.

Impacts & Benefits

Umòja contributes to reviving cultural heritage and enhancing traditional skills by giving craftsmen access to a new market – that of fashion. Some fabrics can take one to three months to manufacture using techniques that have been preserved for generations. Working directly with more than 200 farmers and artisans, including 100 women, enables local families to achieve economic self-sufficiency. 40 new permanent jobs have been created so far – and the company's founders keep on working to identify new innovative, biodegradable materials and to further develop a business model that is inclusive, equitable, supportive and cultural.

Apart from its social approach, Umòja's products tangibly demonstrate the broad variety and suitability of natural, tree-based materials as alternatives for fashion uses – an industry that is still strongly characterized by problematic materials, production methods and working conditions.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

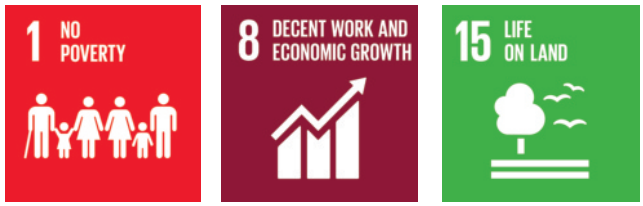
STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

Enabling Factors

The success of the venture mainly results from the quality of the weaving of the fabrics, the beauty of the traditional patterns and the elegant contemporary design – and therefore from the passionate work of the involved partners in seven different countries. In order to make the shoes really unique, direct local collaboration does not end with the producers – through limited edition collaborations with African designers and artists various local cultures are celebrated, and each shoe model tells another story.

Submitter: Umòja Shoes
Location: Ivory Coast, Mali, Burkina Faso, Senegal, Uganda
Website: www.umoja-shoes.com
Contact: umoja@umoja-shoes.com



UMÒJA

Tree-based fabrics

Umòja uses the following traditional tree-based materials and fibers:

Raffia is a natural grown local tree which does not require any fertilizers or pesticides. It grows in marshy areas that are difficult to access. Once the fiber is extracted, it is woven by hand without any looms. Weaving can last from two weeks to several months depending on the desired dimensions.

Lubugo is a warm and resistant textile made from tree bark. The production process is also very complex and time-consuming. The prehistoric technique, considered by UNESCO as the oldest know-how of humanity, is losing ground and has therefore been inscribed on the Representative List of the Intangible Cultural Heritage of Humanity in 2008. Once the bark is removed, the tree is protected with banana leaves to facilitate the regeneration process.

Cork, being a very resistant and waterproof material, is an excellent substitute for certain petroleum products and animal leather. Its harvesting is completely ecological, since cork trees are easily debarked and not damaged by this process.

Banana tree leaves provide a rigid biodegradable material very well suited for yarn, for example. Once the fiber is extracted, it is dried in the sun and woven by hand on handcrafted looms. In Uganda, where Umòja sources its banana tree fibers, the material often substitutes the rare cotton in the country.

Apart from these natural fibers, there are several different synthetic products made from wood fibers or other cellulose available on the market. Especially when derived from recycled or certified sustainable wood and pulp sources, fibers such as Viscose or Tencel are a suitable substitute for cotton, the conventional cultivation of which usually uses huge quantities of arable land, water and agrochemicals.

BAMBOO SPORTS HALL AT PANYADEN INTERNATIONAL SCHOOL, THAILAND

Combining contemporary organic design and 21st century engineering with the traditional construction material bamboo to promote forest- and climate-friendly architecture

The Project

Bamboo is an integral and substantial part of tropical rain forests. Its naturally reinforced tubes have a high load capacity and a tensile strength higher than steel. The Chiangmai Life Architects & Construction company's philosophy is to integrate bamboo and other natural materials such as clay into mainstream architecture by showing that they can be designed to the needs of the 21st century and functionally can compete with common construction materials such as steel and concrete.

The architects' bamboo sports hall for the Panyaden International School in Chiang Mai, Thailand, demonstrates these characteristics, combining the traditional use of bamboo with contemporary, organic design. The 782 m² hall was engineered to modern safety standards of loads, shear forces etc. to withstand the local high-speed winds, earthquakes and all other natural forces. Its innovative structure is based on newly developed, prefabricated bamboo trusses with a span of over 17 meters that do not require any steel reinforcements or connections. Even all nails used are handmade bamboo dowels. Crucial for the construction's stability and its life expectancy of over 50 years is the fact that the bamboo was all well selected for age and treated with innocuous borax salt.

Unlike steel constructions, which cause a high amount of carbon emissions during production, the bamboo hall boasts a negative carbon footprint:

The material has absorbed more carbon during growth than was emitted during treatment, transport and construction.

Impacts & Benefits

The bamboo used for the sports hall came from local community forests. Unlike trees, which are gone after they are cut and need 20-30 years to regrow, the bamboo plant continues to grow new shoots after cutting. Since only poles older than 4 years are suitable for construction, younger shoots remain in the mixed age plantations; no replanting is necessary. Using bamboo as construction material therefore causes no deforestation at all, it actually revitalizes older plants and helps younger ones to thrive. In addition, bamboo stabilizes soil on slopes as its roots grab the earth and grow fast. Thus, especially mixed tree and bamboo plantings can produce better results in the tropics where Monsoon rainfalls tend to wash away loose topsoil.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

Enabling Factors

One main inhibition for natural materials to be accepted as mainstream construction materials is the perception of the audience that they are poor people's or antiquated materials. Bamboo has had the image of being a material that is easily harvested and used but has no strength and durability – easy come, easy go. But through modern science the company found that the material was better than steel once they understood its changing composition of starch and fibre over the lifecycle. Bamboo is now seeing a renaissance. The company's contribution was to create a reproducible and scalable bamboo construction component that can be calculated just like steel trusses and therefore gives mathematical credibility and replicability to the construction.

Submitter: Chiangmai Life Architects & Construction
Location: Chiang Mai, Thailand
Website: www.bamboo-earth-architecture-construction.com
Contact: mark@clcarchitects.com

LA LC Chiangmai Life Architects
Chiangmai Life Construction

Bamboo as a natural alternative

As a lightweight but strong tube with a high tensile strength, bamboo is a natural construction material suited not only for traditional uses, but also for the demands of 21st century engineering – especially in regions prone to earthquakes and typhoons. It can replace steel in many aspects or be used in concrete as tensile reinforcer, etc. Therefore, many structural components of buildings – but also of wind turbines or bicycles, for example – can be made of bamboo. The versatile, carbon-negative material allows for many different uses of different industries: Whether as a wood or plastic substitute, fiber and pulp supplier, raw material for food, medicines and cosmetics, in bio plastic products or as energy source in the form of pellets or charcoal.

A very fast growing, undemanding plant, bamboo can easily be produced almost anywhere – without specific expertise or large investment needed. This allows also developing and emerging countries, which often lack capital-intensive heavy industries, to produce bamboo on a large scale and substitute imports of e.g. steel from other countries. This can contribute to reducing capital outflows, changing supply chains from global to local and shifting revenues from large companies to small farmers.

OPTIMIZED COOKSTOVES TO SUBSTITUTE CHARCOAL BY AGRO RESIDUES IN UGANDA

Austrian know-how contributing to improved technology and establishment of local value chains in order to take pressure from forests

The Project

The urban area of Kampala is currently using up to 1,000 tons of charcoal per day which leads to a rapid decline of forest cover in Uganda. Replacing coal or firewood by local agricultural residues that otherwise would be burned in the fields or rot in the ground takes pressure from the forests and at the same time opens up new business opportunities.

When a large rice mill in Kampala contacted proPellets Austria for marketing possibilities for pellets made from rice husks in Europe, the association suggested to use them locally instead and initiated a joint venture: They connected the rice mill with Ekasi Energy, a South African company producing the Fabstove, a gasifying pellet cookstove, and sponsored a project with the Technical University of Graz, Austria, to optimize it for rice husk pellets. Using state-of-the-art scientific methods such as computational fluid dynamics, the optimization resulted in a massive improvement of efficiency and emissions, making the device the cleanest cookstove in the market today. The TLUD (top lit updraft gasifier) technology minimizes emissions by turning the pellets first into a combustible gas and subsequently burning it cleanly with the help of a built-in electric fan. By this method, half a kilo of pellets suffices for 45 minutes of cooking. Pellets made from all kinds of agricultural residues, such as straw, sugarcane bagasse, peanut shells etc., can be used.

Impacts & Benefits

Due to the high efficiency of the Fabstove, the rice husk pellets from the mill will be able to replace about 30.000 tons of charcoal every year, thereby reducing the pressure on the diminishing forests of Uganda and at the same time allowing people to cook at significantly lower costs. In addition, air pollution caused by charcoal both during production and during home cooking is avoided, benefitting specifically the health of women and children in the households.

Unlike Liquid Petroleum Gas (LPG), which has been strongly promoted to replace traditional cooking methods, pellets from agricultural by-products are a carbon-neutral fuel (thus annually saving 90,000 tons of CO_2 if substituting a comparable number of LPG stoves). Furthermore, whereas the more expensive imported LPG causes capital outflows and foreign dependencies, the creation of a local market for previously unused resources opens up new business models and value chains. Business opportunities arise both from the pellet production and distribution

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

and from the production of the stoves carried out by local franchise partners. Pellet distribution can be performed by the same actors and enterprises as charcoal distribution, many of whom would be out of business if charcoal was replaced by foreign LPG.

Enabling Factors

Using computational fluid dynamics to optimize a cookstove has never been done before. This innovative approach of applying the most advanced techniques to optimize a combustion process in the context of a very simple device has brought about the cleanest pellet cookstove in the world, according to its developers. Once optimized, such a design can be built with simple tools and thus opens lots of possibilities for replication. Ekasi Energy will offer license agreements at low cost for local producers that want to build the stove. proPellets will continue its sponsorship by supporting a website that gives access to pellet production know-how to speed up the dissemination of this technology in Africa.

ekasi.energy
INNOVATIVE BIOMASS ENERGY SOLUTIONS

pro»pellets
Austria

Submitter: proPellets Austria
Location: Kampala, Uganda
Contact: rakos@propellets.at

Fuels from agricultural and forestry residues

According to the International Energy Agency, above 2.6 billion people still lack access to clean cooking facilities, relying instead on solid biomass, coal or kerosene as their primary cooking fuel. Sub-Saharan Africa is the only region where the number of those without access continues to rise significantly and the region with the highest eliance on woodfuel today. This poses a constant threat not only to the health of the households concerned, but also to the health of the planet – due to carbon emissions caused on the one hand, and the reduced potential to absorb CO2 from the atmosphere due to deforestation on the other.

Clean cooking solutions based on locally produced fuels from agricultural and forestry residues (instead of resource-intensive "energy crops" or fossil resources such as LPG) will be key to address both issues and to improve the living conditions of hundreds of millions of households. Suitable raw materials range from "classic" logging residues and sawdust to lesser used residues such as straw, sugarcane bagassee or coconut husks, to mostly untapped resources such as cereal husks, maize stalks or peanut shells, among many others. There are many innovative approaches available to process these natural resources by mechanical, thermochemical or biological processes into solid, liquid or gaseous fuels such as pellets, charcoal, bioethanol or biogas. Pelletizing though is usually the cheapest and most efficient way to use them.

BUILDING UP COMMUNITY-BASED SUSTAINABLE FOREST MANAGEMENT IN ALBANIA

Combining the re-cultivation of community forests with know-how transfer and vocational school education to promote sustainable forest management

The Project

In 2019, the Austrian company Lenzing, an international producer of cellulose fibers with 120 years of experience in the field of wood processing and wood sourcing, launched a best practice project for sustainable forestry in northern Albania. Together with seven public and private local partners and with support from the Austrian Development Agency (ADA), the company aims to share its expertise, support know-how transfer on sustainable afforestation and increase local awareness for sustainable forest management.

Between 2016 and 2018 Albania, being heavily affected by deforestation, realized a land reform through which 80% of the land categorized as "Forest and Pastures" was transferred to Local Government Units. This was done in order to increase the responsibility and involvement of local communities in natural resources' planning and management. The project adds to this by empowering the communities in the rural regions of Shkodra and Ana e Malit through trainings and learning by example

Impacts & Benefits

The project with a total runtime of five years comprises several different measures: To establish a best practice forestry example, 20 hectares of degraded community-managed land are re-cultivated with forest and fruit trees by the local community itself as well as by pupils of the forestry school in Shkodra. The seedling mix used (linden, oak, walnut, hazelnut, pine, olive) was selected by national and international experts with the objective of realizing both erosion control measures and sustainable income generation options for the 1,850 village inhabitants and 300 member families of the local Forest Users Association.

To empower the local communities in the areas of Shkodra and Dibër to manage their forests independently and in a sustainable manner, a local training center for forest management provides modular training courses on

forestry know-how and specific issues such as safety and fire prevention in collaboration with Austrian experts and Lenzing employees. Existing training structures at the Technical and Forestry High School Shkodra are also improved through know-how transfer and education of trainers. Together with experts from Austria and through cooperation with an Austrian forestry school, teaching and learning equipment is modernized. In addition, the Austrian School Shkodra (HTL) works on technical equipment to improve the monitoring of afforestation efforts, e.g. via GPS.

STAGE 1: Concept Development, Site Identification

STAGE 2: Pre-Feasibility Studies

STAGE 3: Feasibility Studies

STAGE 4: Permitting, Financing, Contracts

STAGE 5: Engineering, Construction, Operation

Enabling Factors

The distinctive feature of this project is its combination of different cooperative measures to increase local expertise and awareness through active training, improvement of educational facilities and a hands-on demonstration project. Its decisive success factor is a well-balanced coordination within the multi-stakeholder framework of government units, local NGOs and community associations, Austrian business experts as well as Austrian and Albanian schools.

The project was enabled through a Business Partnership with the Austrian Development Agency. This instrument provides partial funding for projects by companies in developing and emerging countries, which at the same time create developmental and entrepreneurial added value, e.g. by providing technical expertise, business know-how or technology. In order to enable future funding for afforestation efforts, special emphasis will be put on integrating the sector of hydroelectric power stations in the project scope. Since afforestation has a positive effect on land degradation and therefore reduces landslides etc., support for the planting of trees can lower the costs for power plant operators in total.

Submitter: Lenzing AG
Location: Regions of Shkodra and Ana e Malit, Albania
Contact: sustainability@lenzing.com

Lenzing
Innovative by nature

Raising awareness for forest protection

While Albania is the only country in Europe where more trees are felled than planted and where large parts of the woodland are managed by local residents without professional education or training in this field, Austrian woods grow by about 3,400 hectares each year and are mostly managed professionally and sustainably.

The fact that vocational forestry training and sustainable forest management already have a long tradition in Austria may be linked to questions of culture and awareness for these issues: A certain positive attitude towards the forest is deeply rooted in Austrian society, which goes hand in hand with an appreciation for wood as a renewable energy source and for sustainable forestry. With this project Lenzing wants to share not only knowledge but also these values to increase Albania's sustainable approach towards forestry.

Within the scope of the project therefore, also a large-scale communication and PR campaign will be realized on a nation-wide level to raise awareness for the challenges of deforestation in rural Albania, highlighting the negative impacts such as the threat of landslides as well as the benefits of sustainable forest management.

LAND DEGRADATION NEUTRALITY FUND

First-of-its-kind impact investment fund to catalyze private capital for sustainable land management and restoration projects

The Land Degradation Neutrality Fund, co-promoted by the UN Convention to Combat Desertification and Mirova, is a first-of-its-kind impact investment fund investing in profit-generating sustainable land management and land restoration projects worldwide. It provides long-term financing to projects that reduce or reverse land degradation and deforestation on a large scale, while meeting strict environmental and social standards. The target size of the fund is US$ 300 million, mixing public resources from development banks etc. with private capital (approx. 70%) in a layered blended finance vehicle.

The LDN Fund was launched in 2017 with the aim to directly impact 500,000 hectares of land, to reduce carbon emissions by 35 million tons, and to create jobs or improve livelihoods for over 100,000 people, predominantly in rural areas of developing countries. To achieve these goals, all investment projects are regularly monitored for their contribution to Land Degradation Neutrality (using indicators such as land cover change and the amount of carbon stored in soils), their social and environmental impacts, as well as ESG risk management.

The Urapi Sustainable Land Use initiative as the fund's first investment case supports the development of mid-sized cooperatives through the restoration of degraded land and productive agroforestry in Latin America. For example, in the Café Selva Norte project in Peru the developer ECOTIERRA enables a land-use transition of 20,000 hectares to develop organic and fair trade certified agroforestry with coffee plants and multiple timber species. A second transaction was realized with Mountain Hazelnuts, a social enterprise and unique large outgrower scheme in Bhutan, working with impoverished farmers (12,000 households) to plant nut trees in degraded areas (10,000 ha).

Submitter: Mirova Asset Management
Website: www.unccd.int/actions/impact-investment-fund-land-degradation-neutrality
Contact: gautier.queru@mirova.com

mirova
Investing in sustainability

Private capital for sustainable land management

Public resources alone will not be sufficient to reach the SDG target of Land Degradation Neutrality by 2030. Thus, attracting private sector investment for sustainable land management and land rehabilitation is crucial. Blended finance instruments such as the LDN Fund are innovative mechanisms that aim to catalyze the huge available pool of private capital by leveraging limited public resources, e.g. thanks to the latter guaranteeing for potential losses. With the help of adjoint Technical Assistance Facilities, they build local capacities and alleviate bottlenecks through the structuring of investible project portfolios, connecting to international markets, redeveloping value chains, monitoring impacts and sharing expertise.

Well-structured sustainable agriculture and forestry projects can create shared value for both producers and investors: For example, improved agronomic practices help to increase yields and quality; sustainability certifications (e.g. Fairtrade, Rainforest Alliance, FSC) contribute to better prices; payments for ecosystems services, such as carbon credits, can provide an additional source of revenue; consolidating the value chain by constructing processing facilities and linking local coops to international buyers can add value for all actors involved.

SUSTAINABLE TOURISM CERTIFICATION

Based on a decade of practical experience from the Zero Carbon Resorts project, the new ANAHAW label certifies sustainable tourism in the Philippines

Working towards a net zero carbon footprint in tourism and taking stress off the sourrounding forests through broad implementation of resource efficiency measures were the aims of the EU-funded Zero Carbon Resorts (ZCR) project implemented in the Philippines and Thailand between 2009 and 2018. Local consultants were trained to conduct energy audits and advise tourism SMEs to systematically revise their supply chains along a reduce-replace-redesign strategy in order to increase efficiency in all aspects of operation including land-use, energy, water, waste etc. By that, local tourism enterprises were enabled to become more resource efficient, energy autonomous, less polluting and more environmentally conscious. In addition, the project promoted local production of renewable materials and green technologies through the Green Suppliers Network. An energy-autonomous showcase cottage built with locally available natural materials in Puerto Princesa became an award-winning hands-on demonstration building and serves as learning center until today.

Based on these practical experiences, a standardized sustainable tourism scheme has been developed to enhance national and international awareness and stimulate further replication of sustainable tourism in the region. Being more than just a checklist, the government-approved ANAHAW Philippine Sustainable Tourism Certification provides guidance and continuous improvement with indicator- and performance-based metrics to all interested accomodation establishments in the Philippines. With each of the five levels of certification, not only the environmental performance and touristic attractiveness improve, but also the corresponding economic savings, which can reach up to 50% compared to average consumption. The ANAHAW label is the country's first sustainable tourism certification recognized by the Philippine Department of Tourism and its criteria were also adopted for a label in Thailand.

ANAHAW
Philippine Sustainable Tourism Certification
developed by the Zero Carbon Resorts Project

GrAT
Center for Appropriate Technology

Submitter: Gruppe Angepasste Technologie (GrAT) – Center for Appropriate Technology
Website: www.zerocarbonresorts.eu
Contact: zcr@grat.at

Green certifications and seals of quality

Certificates and seals are suitable instruments to increase transparency, visibility and credibility of sustainable business solutions and can potentially serve both providers and consumers of products and services. The markings honor companies that voluntarily comply with a binding set of rules, based on certain measures and quality features in the areas of management, product design or stakeholder relations. Recognized certification marks make this voluntary commitment visible and can improve the reputation internally and externally. At the same time, the underlying systems make it easier to measure, control and improve business processes.

In a narrower sense, forest-related certifications and labels such as FSC, PEFC, Rainforest Alliance etc. mark sustainably managed forests and their products. In a broader context, certification systems of other industry sectors can also contribute to forest protection and sustainable land-use. As such, the ANAHAW certification helps to build a new sustainability paradigm in the tourism industry and to reduce pressure on the surrounding forests.

FOREST-FOCUSED SCHOOL COMPETITION

In Georgia, the Niko Ketskhoveli Prize awards schools for their longstanding environmental engagement

In 2016, the Niko Ketskhoveli Prize was established as an environmental youth award in the scope of the project Promoting Sustainable Forest Governance in Georgia, with financial assistance from the Austrian Development Cooperation. The annual national school competition aims to foster environmental education with special emphasis on forest-related issues and engage youth in civil life. Registered youth groups can collect points for organizing activities, events or small-scale research projects according to the challenges and tasks provided on forestry.ge. At the end of each competition year, an expert jury selects three out of several hundred participating "eco clubs" to receive the award in the name of Niko Ketskhoveli – a famous Georgian biologist, scientist and writer.

The project raises the schoolchildren's awareness on the importance of the forest ecosystem and cross-cutting issues, thereby contributing to a positive and responsible attitude towards forests and nature in general. Moreover, it spurs concrete environmental activism such as the adoption and care of recreational forest sites, the organization of hundreds of clean-up and tree planting activities in cooperation with the National Forestry Agency, bans on single-use plastic at schools etc. The activism coming from the schoolchildren even initiated the Krtsanisi Forest Park development program, resulting in the conservation of 210 hectares of urban forests near Tbilisi.

To top it off, the program is supported by extra-curricular Green Camps for active eco clubs, special summer trainings for school teachers, and printed and digital knowledge materials, which are distributed for free to rural communities, rural women's clubs, universities etc.

Submitter: Caucasus Environmental NGO Network (CENN)
Website: www.forestry.ge, www.cenn.org
Contact: rezo.getiashvili@cenn.org

CENN
Shaping the Future by Changing Today

Activating the young generation

Both forest and climate protection efforts must be conceived in the light of a time horizon of several decades. Since today's decisions and actions define the future of today's youth and the question of what world they will live in, they need to be sensitized, involved and listened to. Greta Thunberg and the global Fridays for Future movement have shown that the young generation is ready to get actively involved and how much impact they can have. International voluntary initiatives such as the "Climathon" demonstrate how young people can successfully co-create solutions for climate challenges together with public administrations and experts.

School competitions such as the Niko Ketskhoveli Prize can be important levers to sensitize, educate and activate people for environmental issues – also far beyond schools. Especially in rural areas of developing or emerging countries, schools often represent the only active organizations at the community level. As school children organize and implement awareness raising activities, they send a strong, positive message to their families and community, often resulting in real behavioral change. Building partnerships with schools can therefore contribute to a more responsible use of natural resources, better educated communities and increased public participation.

ACOUSTIC MONITORING OF RAINFORESTS

A Californian start-up transforms recycled cellphones into autonomous listening devices to stop illegal logging and poaching

The start-up Rainforest Connection (RFCx) is a non-profit company that has developed an innovative real-time detection and alert system for logging and environmental conservation in the rainforest. They use old cellphones, equip them with purpose-built solar chargers and hide them up in the jungle canopies to monitor and pinpoint deforestation and poaching activities.

The phones – each monitoring a 3 km radius - are placed in vulnerable areas of forests, close to roads and tracks, to form a network of "Forest Guardians". Operating 24 hours a day, live audio streams from the devices are uploaded and artificial intelligence models filter the sounds of unusual activities, such as the use of chainsaws, logging trucks and vehicles, from the natural soundscape of the woods. If suspicious activities are detected, the system automatically provides partners on the ground with an instant warning about its exact location and type. Rainforest Connection forms partnerships with local tribes, NGOs and government agencies, so they can show up and stop delinquents in real time - ideally on their way in, before the damage has been done.

Submitter: Rainforest Connection
Website: www.rfcx.org
Contact: contact@rfcx.org

Thanks to partnerships with large technology companies and the introduction of machine learning, the system has become capable of detecting more subtle things, such as gunshots, human voices, or specific birds. Today, the technology is thus also being used to monitor and archive the sounds of rare or important species, providing scientists with a new means to study the health of wildlife populations in a given area. The system has already been extensively tested with local communities in Brazil, Costa Rica, Ecuador, Philippines, Peru, South Africa, amongst others – and dozens of new projects are in the pipeline.

Driving technological innovation

Innovative ideas, technologies, products and services can open up new paths in forest protection and provide great opportunities for non-profits as well as companies in the forestry and timber industry. In order to actively promote innovation, "hackathons" – day-long events, in which technicians, computer programmers, designers etc. creatively collaborate to develop new software or hardware – have become an increasingly popular tool.

One example is the international Evergreen Innovation Camp, initiated by the Austrian wood industry company HS Timber Group in 2019. The first of the annual 48-hour events was focused on traceability in the forestry and wood sectors and brought about several promising concepts: The winning team, "Tree ID", developed a system which scans standing trees, creates a unique profile of their stem contour and branch distribution, and later compares it with laser measurement data from the sawmill. Another team, "Smeasure", developed a forestry worker's tape measure with integrated camera and GPS module to efficiently scan growth ring patterns and tree branches of felled trees. These and other innovative solutions such as RFID chips, satellite imagery etc., have the potential to contribute greatly to sustainability and transparency of wood products.

FIREWOOD ASSESSMENT

A comprehensive assessment of the Georgian forests' firewood production potential revealed a massive over-exploitation and enabled a forestry reform

In Georgia, firewood is the main source of heating, accounting for 75-96% of all fuel used, depending on the region. According to national legislation, the government is obliged to provide firewood resources for its population. However, highly inefficient heating systems, fragmentary public forest inventories, and the massive use of the forests for social purposes over the last 30 years have put the country at risk of an environmental disaster as well as socio-economic and energy shocks. Due to the urgency of the problem, a mandatory state program on the provision of fuel resources became part of the EU Association Agreement road map and in 2016 a comprehensive assessment was initiated in order to determine the actual firewood demand and evaluate the energy capacity of Georgian forests.

The Assessment of Firewood Consumption and Firewood Production Potential in Georgia was conducted by CENN in close cooperation with the National Forestry Agency (NFA), the Ministry of Environmental Protection and key stakeholders. Based on an agreed calculation methodology, the project determined the annual amount of sustainable firewood consumption and the actual firewood usage by households to identify deficits on a national, regional and municipal level. The results of the study revealed a dramatic shortage in legally and sustainably cut firewood in Georgia, resulting in massive forest degradation and deforestation. According to the calculations, actual consumption is three times higher than the amount annually allocated by the NFA. After the announcement of the study results, forestry became a main priority on the country's political agenda. A new Forest Code was elaborated (2019-2020), which abolishes the practice of "social cuts". As a result, illegal forest logging is decreased via relevant regulations and intersectoral cooperation. In particular, the construction of so-called "business yards" is planned, where firewood will be distributed by local contractors of the NFA, including former illegal forest loggers.

CENN
Shaping the Future by Changing Today

Submitter: Caucasus Environmental NGO Network
Website: environment.cenn.org/sustainable-forestry
Contact: rezo.getiashvili@cenn.org

Changing the political framework based on evidence

The success of any major forest protection effort ultimately depends on political and institutional framework conditions. Whether to strengthen political governance and enable effective policy dialogue on the one hand, or to convince decision makers and key stakeholders on the other – it is always essential to provide data and strong evidence for suggested actions, and therefore to invest in quality research.

Where fundamental information is lacking, studies such as the one presented above provide the data needed to base political deliberation, decisions and legislation on it. Apart from its contribution to Georgia's new Forest Code, the CENN firewood study has pushed an issue-oriented dialogue resulting in various projects and initiatives focused on sustainable heating alternatives. In 2018 and 2019, the state program on eliminating shortage of heating resources was elaborated, which will take off from mid-2020 with financial support from the Green Climate Fund. Moreover, the results of the study and the follow-up documents became part of the official Climate Action Plan of Georgia (2021-2030).

SUCCESS FACTORS & POLICY RECOMMENDATIONS

Based on the experiences of developers and stakeholders of the projects and initiatives presented in this white paper, central success factors and recommendations have been derived. They reflect the individual lessons learned of the people and projects involved; nevertheless, they comprise general findings that can inform and encourage other project developers, investors and policy makers. The overall goal is to support the development, implementation and long-term maintenance of sustainable forest-related projects that benefit the climate, natural ecosystems and people – particularly in the Global South. While the specific challenges for climate projects in developing and emerging countries have been discussed in previous reports, the following recommendations focus on issues related to forests and natural landscapes.

Successful afforestation, prevention of deforestation

Planting trees to restore forests, mangroves or other natural landscapes helps restore habitats and ecosystems, creates jobs and income and is an effective nature-based solution to climate change – if implemented appropriately. To ensure that an area offers an environment where tree seedlings can actually thrive, it is usually best to plant trees on former forest land – ideally in regions considered specifically rich in biodiversity. Since there is no "one size fits all" approach, tree seedlings should be selected based on their specific traits and suitability for the local circumstances. A mix of indigenous species will be best in terms of the forest's resilience and biodiversity of both flora and fauna; monocultures and non-native species should be avoided. Nevertheless, also efficient forest plantations – which will be indispensable for the bioeconomy of the future – can be managed responsibly and integrated well into natural landscapes.

For the long-term success of reforestation efforts, it is important to plant trees only where people want them in the first place and where there are no adverse incentives to fell them later on. Thus, the benefits of intact forest ecosystems must be actively communicated. Important additional incentives are job creation through the nursing, planting and sustained care of trees, or the inclusion of welcomed fodder, fruit, nut or timber tree species for future income generation (e.g. in mixed agroforestry systems). In general, the local population needs to be included in both the planning and planting as well as the later management of the forest. Since deforestation can result from many factors, including ignorance, poverty, market forces, political interests, weak regulations or a lack of capacity to enforce them, it should be checked early on if these root causes can be addressed.

> *"Programs and initiatives of this kind have to be developed from the needs of those directly affected and involved, decided and supported by them. Local knowledge needs to be taken into account and built on, exchange and further education must be enabled."*

In addition to these preconditions, maintenance contracts with local partners, physical protection of tree seedlings, and long-term monitoring through field visits, satellite imagery or other contemporary means should be ensured.

Contributing to forest protection by doing business

There is a great number of industries and sustainable business models which can actively contribute to the conservation and rehabilitation of forest ecosystems – not only in forestry and agriculture, but also in the energy and construction sectors, the textile and fashion industry, in pharmaceutics, cosmetics, tourism and many more value chains associated with forest products and services.

Bamboo Sports Hall by Chiangmai Life Architects & Construction

As projects in this report demonstrate, there are several innovative ways to reconcile economic success with forest and climate protection. Examples of tree-based fashion, bamboo architecture and efficient cooking stoves show that these frequently have to do with building upon traditional knowledge and techniques and combining them with state-of-the-art (scientific) methods. Also wood traceability, deforestation prevention and sustainable sourcing in general can be improved through modern technology and certifications.

"It is important for people and companies in Austria and the Global North to better understand their supply chains, and to support those organizations that are making a positive difference. Well managed supply chains are not only more sustainable, but lower risk and more robust & resilient in an increasingly uncertain global market."

Fairtrade agroforestry coffee by EZA Fairer Handel

Companies that engage early in future-oriented circular economy models and nature-based solutions will advance both their own business value and true sustainable development, particularly in the Global South.

Finally, also finance has a major role to play in this transition of our fossil-based economy towards one based on wood and other bio-resources: Impact investment funds such as the one presented in this report demonstrate, that financing sustainable land management and restoration projects can be profitable – and thus, how private investment can add to the internationally agreed goals.

Partnerships for forests

Whether for business endeavors or non-profit initiatives, partnerships are essential to the success of any forest (and climate) protection project. Building coalitions between public institutions, private entities and the civil society is a powerful tool to "connect the dots", align visions and coordinate various initiatives to maximize the impact. Especially for larger-scale projects, a cross-sectoral approach, bringing together all key stakeholders who have a shared interest in forest landscape stewardship, intact local ecosystem services and resilient communities, is crucial. This includes partners from industry and local value chain businesses, academia and ecologists, local representatives and decision makers, amongst others.

Also on a lower level, when implementing smaller conservation or sustainable business initiatives on the ground, personal relationships, trust and transparency first need to be established. Direct contact to the local population, exchange on an equal footing, respect and appreciation of the regional (indigenous) culture are the prerequisites for successfully communicating the benefits of a project. Also, establishing demonstration examples on site and providing direct support (through training for farmers or forestry workers, partnering with local schools and universities, making available equity, loans and business development support for SME's – and in general: enabling planning security through long-term relationships) is essential.

„Collective action can only be done through partnerships, so invest time, money and effort in cultivating meaningful collaborative partnerships."

Finally, going beyond local, personal partnerships, also intercultural/intercontinental exchange can contribute to intact forests: Making people aware of other cultures and living conditions can sensitize them for the interconnections between consumer behavior and forest destruction.

LDN Fund's investment in sustainable land use in Peru

POLICY RECOMMENDATIONS

Mainstream forest preservation. Landscape restoration as foreseen by the UN Decade on Ecosystem Restoration is a holistic venture not only in the sense that it aims to rehabilitate the very foundations of humanity's economic and social activity, but in the sense that it must transcend political realms. As it should be the case for climate action in general, forest and landscape preservation need to be embedded in all policy fields, overcoming sectoral barriers including those between agriculture, forestry, environment and finance (ministries). The broad policy objectives on international, national and sub-national levels then need to be translated into institutional, legal and regulatory frameworks to promote specific actions.

Rely on data and monitoring. To effectively enact policies and regulations, governments need data and strong evidence. Thus, comprehensive inventories and natural capital accounting approaches should be implemented, which help to quantify the economic value of forest ecosystem services. Exact measurement, reporting and verification schemes (MRV) must be established to monitor progress towards meeting domestic goals and international obligations.

Mobilize the private sector. To reach the SDG target of land degradation neutrality, private actors – both for-profit and non-profit – need to be activated. Thus, the benefits of restoration need to be widely communicated, stressing the fact that they far outweigh the costs. Misperceptions about the competition between forests and other land uses need to be dispelled, and potential win-win situations highlighted, e.g. in terms of food production, job creation in rural areas, or ecosystem services such as flood prevention.

Unlock private capital. In order to mitigate risks surrounding the legal, technical or financial feasibility of private restoration projects (specifically in developing and emerging countries) and to increase investment-ready opportunities, public support in the form of technical assistance, insurance guarantees or first-loss capital can be provided. Introducing carbon prices and payments for ecosystem services can efficiently allocate funds in the desired direction.

Provide incentives. Economic and other incentives (e.g. through public awards and official certifications) can reward actors at all levels of society (individual landowners, companies, cities and regions, etc.) for reorienting towards a resource-efficient, circular economy and taking verifiable preservation and restoration steps. Adverse incentives, such as agricultural subsidies which make land degradation profitable, must be abolished.

Generate and share knowledge. Being confronted with multiple crises, societies and governments should engage stronger with experts, collate information and apply the precautionary principle. Research and education institutions such as universities and schools as well as other settings to spur innovation and share knowledge must be supported.

CENN firewood consumption assessment in Georgia

Leave no one behind. Support developing and emerging countries in their efforts and maintain a special focus on rural and vulnerable communities; respect the rights and knowledge of indigenous groups and value their contribution.

Apply all available means. As it is true for climate action in general, we will need to implement all of the measures we have to reach the internationally agreed goals on forest protection and sustainable development. All solutions presented in this report – from conservation and rehabilitation initiatives, to different forest-related sustainable business models, to various supporting instruments – will need to do their bit.

FURTHER READINGS FOR PROJECT DEVELOPERS AND INVESTORS

As the projects presented in this report have illustrated, there are vast opportunities for project developers and investors to engage in – and profit from – activities in connection to intact forests, be it eco-tourism, sustainable agroforestry models, or the innovative use of traditional building materials and plant fibers.

In general, incorporating landscape conservation and nature-based solutions into projects can create positive business effects, for example by lowering operational costs, unlocking new revenue streams, increasing customer engagement or delivering public environmental goods. More specifically, sustainable management of natural and planted forests and the entire forest value chain provide much potential in view of the transformation that is needed to bring our economy in accordance with the internationally agreed goals of climate neutrality, sustainable development and net-zero deforestation. Both innovative new bio-based solutions as well as already well-established forest-related business models need to be further developed and scaled.

Building upon established business models…

Since the economic benefits of sustainable forest management and landscape restoration usually far exceed the costs, returns on private investment in these sectors can be high too. Specifically well-suited projects are those which generate direct benefits such as sustainable and higher agriculture or timber yields, increased diversification and resilience, or market premiums on products from restoration etc. However, it can be hard for private investors to turn some of the other benefits – e.g. climate stabilization, improved wildlife habitat, or aesthetic landscape values – into financial income, weakening their overall business case. To incentivize private investments in existing or new sustainable land-use projects there are several public funds as well as private philanthropic institutions that provide subsidies, concessional loans etc. Also voluntary corporate and private payments for biodiversity or carbon offsetting can close this gap. Examples for the sustainable restructuring of existing business models are, amongst many others, the transition from intensive cultivation methods to agroforestry, "softened" tourism concepts, or the adaptation of wood plantations to include protected areas and restore wetlands etc. Complementing these sectors, there are many other industries that can be included in the forest value chain: Due to the fact that wood products cause much less environmental and social impacts than most products based on fossil fuels or other raw materials that require energy-intensive extraction, production and disposal, they are increasingly used as substitutes. This already happens to a substantial degree in the building sector where timber replaces cement and steel – not only saving carbon emissions, but even storing it for decades. Moreover, different kinds of aluminium and plastic products are replaced, as well as cotton in the textile industry.

Another forest-related industry with still much potential is the bioenergy sector: On the one hand, due to the large share of inefficient "traditional" energy uses globally there is much room for improvements, e.g. through efficient stoves, using offcuts and recycled wood products rather than virgin timber. On the other hand, modern bioenergy will also be a vital part of the future energy mix, particularly for functions not so easily filled by other renewable energy sources – including heat, baseload electricity and transport fuel.

… and developing new bio-based solutions

The future economy will hold a vast field of forest-related and other bio-based business models and investment cases that go far beyond the projects presented in this report. If we want to reach net-zero emissions, much of the processes and things we use today, will need to be replaced by solutions that yet need to be fully developed – much of them relying on wood and other biomass as main input factor. Current investments in technology and innovation of products and processes open the doors to a broader market beyond established wood uses, further incorporating industries such as automotive, pharmaceutical, chemical, cosmetic and textiles into the forest

production chain. For example, new thermo- and bio-chemical processes to derive liquid fuels from wood waste and by-products are being developed. Some companies are already producing biodiesel from tall oil and black liquor – residues from the pulp-making process. The range of products that can be derived from cellulose and lignin – the main components of wood – is steadily increasing. The spectrum ranges from bio-synthetic fibers, adhesives and paints, to food additives and medications, to new bioplastics and cellulose monocrystals for high-performance materials.

In the context of the 2050 scenario for a bio-based circular economy, the concept of "bio-refineries" as a substitute for today's fossil-based processes will become essential. As a result, global timber demand is projected to almost quadruple by mid of the century. Since there are limits to how much more timber can sustainably be harvested from natural forests, this will open up a massive potential for sustainably managed plantations. International organizations such as the FAO have therefore elaborated guidelines for the responsible management of planted forests and initiatives such as the WWF-led New Generation Plantations platform work to replicate good practices.

Financing for forests

The shift to a bioeconomy offers particular opportunities for developing countries with limited resources but plenty of land. While support from governments and international financial bodies will remain vital to scaling up forest restoration and sustainable land management, much of the needed funding will have to come from private sources. For the forestry sector, a bioeconomy represents a switch from present high-volume, low-value commodities to an enormous range of high-value, low-volume products. This presents opportunities for small producers and SMEs in particular to innovate and capture value.

Financial support for the implementation of projects is offered by non-governmental institutions such as the World Wildlife Fund, by development organizations and forest funds on regional and national levels, and large institutions such as the Global Environment Facility, the World Bank's Forest Carbon Partnership Facility and the Green Climate Fund. For projects in Europe, the Natural Capital Financing Facility can be addressed, a partnership between the European Commission and the European Investment Bank to promote explicitly commercial nature and climate protection projects. An overview on further conventional and innovative financing approaches for climate projects can be found in last year's Special Report.

Follow-up links

The state of the world's forests explained:
www.fao.org/state-of-forests
www.globalforestwatch.org/map

UN Forum on Forests study on ecosystem services:
www.un.org/esa/forests/wp-content/uploads/2018/05/UNFF13_BkgdStudy_ForestsEcoServices.pdf

Financing guide for conservation and NBS projects:
www.eib.org/attachments/pj/ncff-invest-nature-report-en.pdf

Further forest-related Climate Action Stories:
www.climateactionstories.com/land-use-forests-biodiversity

Additional resources:
www.cifor.org
www.iufro.org
www.foreststreesagroforestry.org
www.globallandscapesforum.org

NOTE OF THANKS

We would like to thank everyone who submitted their projects or contributed to the creation of this report with their expertise. We would also like to give a special thanks to the following organizations and participants: alchemia-nova GmbH, Andrew Heald Consultancy, Austrian Development Agency, Austrian Federal Economic Chambers – Advantage Austria (WKO), Cámera de Conservación Ecológica (Cámera Red-RSP), Caucasus Environmental NGO Network (CENN), Chiangmai Life Architects & Construction, Climate Alliance Austria (Klimabündnis Österreich), Ecosia GmbH, Ekasi Energy, EZA Fairer Handel GmbH, Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK), Georg Günsberg Strategy Consulting, Gruppe Angepasste Technologie (GrAT) – Center for Appropriate Technology, HORIZONT3000 – Österreichische Organisation für Entwicklungszusammenarbeit, International Union of Forest Research Organizations (IUFRO), Lenzing AG, Mirova Asset Management, Mondi Group, proPellets Austria, Rainforest Connection, Umòja Shoes, University of Natural Resources Vienna (BOKU), and WWF – New Generation Plantations.

Special thanks go to FOR FOREST – The Voice for Trees:

FOR FOREST developed out of the 2019 art intervention "The Unending Attraction of Nature" involving almost 300 trees in the Wörthersee football stadium in Klagenfurt, Austria. The global initiative wants to give forests a strong and powerful voice as well as an open stage, where art and culture play an essential role. It attracts attention to forests and the current issues they are facing by supporting and promoting projects that raise awareness for environmental protection and the climate crisis in creative, sustainable and eco-friendly ways. FOR FOREST is Leading Partner of the AUSTRIAN WORLD SUMMIT 2020.

FOR FOREST
THE VOICE FOR TREES
Attracting attention & creating solutions to challenge the climate crisis

Art intervention in the Klagenfurt Wörthersee football stadium in summer 2019

THE SCHWARZENEGGER CLIMATE INITIATIVE

The Schwarzenegger Climate Initiative focuses on building awareness of the climate crisis and the urgent need for action every day and once a year at the AUSTRIAN WORLD SUMMIT (AWS). The AWS, entering its fourth year, provides a platform for highlighting concrete solutions and measures from global decision makers committed to preserving a healthy planet and decarbonizing the economy by 2050. The Schwarzenegger Climate Initiative presents workable solutions, connects these ideas to available technical and financial resources, and supports best-in-class climate protection projects from all over the world.

AUSTRIAN WORLD SUMMIT

The AUSTRIAN WORLD SUMMIT is the centerpiece of the Schwarzenegger Climate Initiative: Since its founding in 2017, the AUSTRIAN WORLD SUMMIT has become one of the largest climate conferences in the world thanks to the patronage of the Austrian Federal President Alexander Van der Bellen and with the support of the Schwarzenegger Institute and many generous sponsors. The Summit serves as the leading international „Matchmaker for Green Solutions" by presenting successful policies, best practice projects, and examples of cooperation and innovative solutions. Recognizing the importance of reaching out to the global public, last year the Schwarzenegger Climate Initiative added the „Climate Kirtag" to the program. Over 10,000 people attended the open-air festival featuring famous Austrian musicians, celebrities and climate champions all committed to fighting pollution and climate change. More people join our movement every day – we are looking forward to hosting the next Summit on 17 September 2020 at the Spanish Riding School in Vienna.

CLIMATE ACTION STORIES

The solutions to the climate crisis are out there already! On our new online platform **www.climateactionstories.com** we showcase successfully implemented projects and role models from all over the world! With this living project collection we spread their stories and highlight defining success factors in order to encourage replication and accelerate the transition to a low-carbon future. Get inspired, submit your own Climate Action Story and BE THE SOLUTION!

brainbows informationsmanagement gmbh
Phone: +43 1 796 54 44
www.brainbows.com
navigator@brainbows.com

www.schwarzeneggerclimateinitiative.com