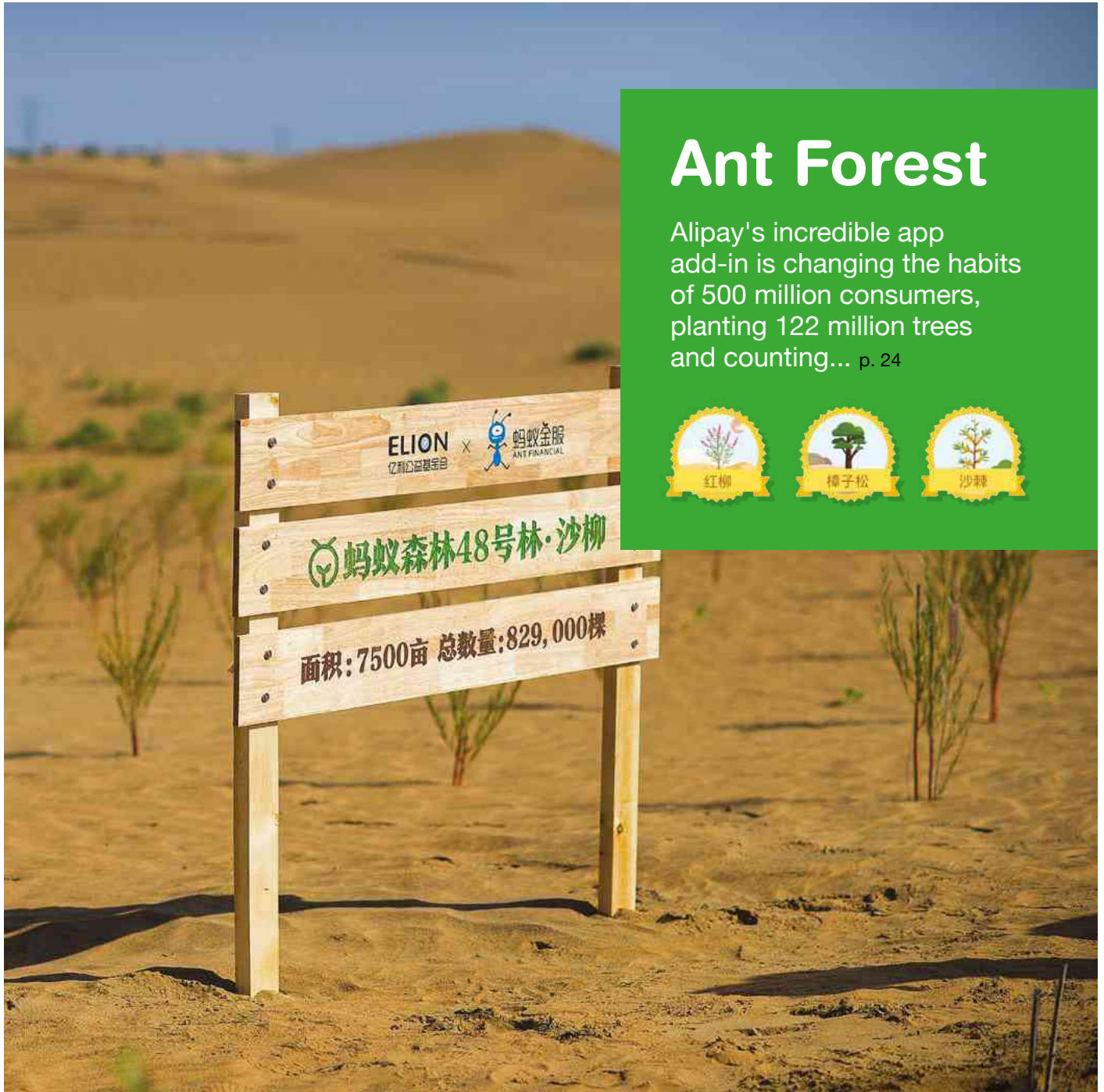


REVOLVE

QUARTERLY INSIGHTS INTO A CHANGING WORLD

N° 35 | Spring 2020



Ant Forest

Alipay's incredible app add-in is changing the habits of 500 million consumers, planting 122 million trees and counting... p. 24



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Celebrating 10 Years of Communicating Sustainability

This year REVOLVE celebrates 10 years of fostering cultures of sustainability. In 2010, we were novices experimenting with a bi-chrome green-blue logo that has been replaced by our monochrome black logo and its revolving circle icon. The green here is the lead color for the themes of nature, environment, forests, and climate that pervade the spring issue of REVOLVE. Ten years on, we are proud to open new offices in Vienna and Barcelona as you will discover on **page 70** →

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Cover image: Alipay Ant Forest
Photo: Ant Financial Services Group

REVOLVE is committed to taking climate action to limit our carbon footprint on Earth. We have a zero-waste policy for all our products and activities, from recycling our exhibition canvases [see our REPURPOSING program] to offsetting our emissions from travel [see our REFOREST program].

 Join revolve.media/reforest | revolve.media/repurposing

In partnership with Reforest'Action in 2019, REVOLVE offset 14 tons of CO₂, generated by 60,802.18 kilometers of staff travel, via 14 Verra-certified carbon credits from a forest conservation project in Brazil, and planted 98 trees in Roupage, the Ardennes territory in south-eastern Belgium.



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The REVOLVE communication group is about fostering cultures of sustainability. With offices and staff in Barcelona, Beirut, Brussels, Lisbon, and Vienna, we publish an international magazine (ISSN 2033-2912) that compiles the 'best of' from our online content in quarterly issues focusing on water (winter), nature (spring), energy (summer), and transport (autumn) with the circular economy as a recurrent theme. To subscribe, order back issues, or discover all our publications, including our country and industry reports, visit: www.revolve.media/shop



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The Bioeconomy

Bringing life to the center of our economy

The industrial era and the fossil-based economy which have dominated the last 200 years of our history are coming to an end. Our economic system – powered by the massive use of fossil-based resources – has made possible the greatest and fastest economic, social and technological progress in human history. However, it has also resulted in an unprecedented environmental crisis, which is putting at risk life on our planet, and the economy that sustains our world.



The climate crisis and biodiversity loss are two sides of the same coin: the crisis of our fossil-based economic system

The way forward is clear: we need a new economic system that functions within the renewable boundaries of our planet. How to transition towards it is the tricky part: it requires the greatest economic change in human history. It means decarbonizing our economy in three decades while enhancing our natural carbon sinks and biodiversity. All this while making sure that we have a socially fair and inclusive transition.

To do this well, we will need transformative and holistic policies, massive investments and innovations at many different levels to rethink business models, markets as well as consumption and production cycles. But above all, we need to address the past failure of our economy to value nature, because nature and life (bio) need to become the prosperity engine of the new economic system. The good news is that the advance of technology in the biological, physical and digital worlds as well as new concepts like the circular economy and the bioeconomy makes this transition possible, while offering the greatest business opportunity of the 21st century.

The bioeconomy as a catalyst

Moving to a carbon-neutral economy requires fossil-free energy and a shift to fossil-free and renewable materials to decarbonize important industrial sectors like construction, transport, clothing, chemicals and packaging. To do this sustainable shift, the only renewable alternative that we have is to transform biological resources, which are carbon neutral by nature, into a new range of bio-based solutions to replace materials like plastics, concrete and steel. This is what the **bioeconomy** – using advanced technologies – can do.

However, biological resources, even if they are renewable, are not unlimited: this is where the **circular economy** concept comes in. A circular economy approach is crucial to rethink business models and design products and services in new ways to decouple the prosperity of industrial businesses from the mere consumption of products. It is also about making products that can be easily reused and recycled, minimizing waste and maximizing their value along their life cycle.

One of the most important societal challenges of this century is to address inequalities and to ensure **inclusive territorial prosperity**, including jobs and infrastructures in

rural and “depressed” areas. The way biological resources are owned and distributed and even the difficulties related to their mobilization, transport and processing offer potential opportunities. Look for example at forest resources in Europe: they occupy more than 40% of the land and are owned by about 16 million forest owners. Already, the forest-based sector includes around 400,000 companies, mostly small enterprises, and provides more than 3 million jobs. This is a very valuable socio-ecological infrastructure that needs to be acknowledged and nurtured. It is true that mobilizing, transporting and processing fossil resources like oil is much easier than producing, managing (for 100 years), transporting and processing wood. But this difficulty is at the same time its strength in order to redistribute wealth, jobs and infrastructures, and ensure that we have human capital ready to take care of our natural capital.

The bioeconomy’s most transformative characteristic should be the recognition and value of this natural capital – with **biodiversity** as its cornerstone. Biodiversity is a precondition for a bioeconomy, because it determines the adaption and resilience of biological resources to a changing environment. A bioeconomy needs advanced technology and innovation to succeed but it is ultimately powered by nature and biodiversity. Thus, the bioeconomy, a *regenerative* economy, is about bringing life to the center of gravity of the economy and human prosperity.

“Our deepest hope as humans lies in technology; but our deepest trust lies in nature,” said economist Brian Arthur. The collision of technology and nature very much defined the 20th century. Their integration will define the 21st century – the century of biology. ●

MARC PALAHÍ

DIRECTOR, EUROPEAN FOREST INSTITUTE



The Disappearing of Indonesia’s Rainforests

WRITER: NICOLE JAO

In early August 2019, I went on a ten-day journey across the Indonesian provinces of North Sumatra and Aceh. The trip was part of a larger project started by a group of conservationists from Indonesia, and an art institute from Taiwan, to inspire action and encourage like-minded individuals who care deeply about protecting the rich natural habitat in Indonesia.

At the crack of dawn, we load our belongings into a mini-van outside our hotel in Medan – the capital of North Sumatra – and prepare for a nine-hour bumpy eastward ride through the muddy and hilly paths. We arrive at a small fishing village just before sunset and hop on a narrow boat with our gear and backpacks. The boat travels up along the Alas River, the setting sun dimly lights up the sky in golden hues. Except for the splashing of waves and rumbling of the motorboat engine, it is quiet and peaceful as the evening falls and we arrive at the Soraya Research Station.

The outpost is located in the Leuser Ecosystem, which consists of 2.6 million hectares of rainforests, peat swamps, and meadows spanning the northern Sumatra. Globally, it is recognized as one of the richest natural rainforest ecosystems and is the only natural habitat where critically endangered species like orangutans, rhinos, elephants, and tigers co-exist. The natural ecosystem is diminishing at an alarming rate due to both human development and climate change.

Kingdom of oil palms

In daylight, patches of oil palms are scattered in the lush greenery on both sides of the river and the narrow boats filled with glazed-black and bright-red seeds of the oil palms; the boats go back and forth across the river, a sign of the burgeoning palm oil industry activities in this natural area that is supposed to be under protection.

We are advised not to use snap photos of the illicit activities.

“The oil palm industry supports the livelihoods of millions of workers living in Indonesia. Even so, it is important

1. Entering the wild rainforest. Photo: Keting Chen

that the country finds a way to be sustainable,” says Irham Hudaya Yunardi, Communication Officer at the local environmental campaign and advocacy organization called HAKA.

Indonesia is the world’s largest producer of crude palm oil with total output recorded last year reaching 42 million metric tons, according to the Indonesian Palm Oil Entrepreneurs Association (GAPKI). Sumatra and the neighboring islands account for over 90% of the world’s palm oil production.

The booming industry, which contributed around 2.46% to the country’s gross domestic product (GDP) in 2017, comes at a cost on the local rainforest ecosystem. Illegal forest clearing activities take place on the island every day to make way for more economical plants.

The last refuge

Meeting the eyes of an orangutan is perhaps one of the most memorable wildlife encounters I have ever had.

A mother orangutan was feeding in the trees with her baby just on the edge of the forest, a few feet away from the research station. Swinging from one tree to another, the rustling sound of leaves allows us to spot them easily in the abundance of background greenery. Strangely enough, it was not the foreignness, but the familiarity that struck me. Their facial expressions deliver emotions, thoughts, and feelings just like us. And their eyes speak, just like ours.

The orangutan population that resides in the forest has adopted its unique culture, according to a German researcher at the

research station. In fact, the language and behavior of orangutan populations on the Sumatra island vary with their geographic location, which suggests that losing a population of orangutans

Sumatra and the neighboring islands account for over 90% of the world’s palm oil production.



2

would mean losing a unique culture. There are not many of these orange-furred creatures left in the region anymore. The effects of climate change and man-made fires have led to the loss of their habitat and vital sources of food.

Warmer, drier summers

After spending four days at Soraya, we head north-west to the peat swamp at the SUAQ Balimbing Monitoring Station, an outpost dedicated to studying the orangutan species located on the border of Gunung Leuser National Park. Straddling the border of North Sumatra and Aceh, the national park

covers roughly 1 million hectares of tropical rainforest.

The boat trip into the peat swamp was a rough ride. The water level of the river that leads into the peat swamp was significantly lower than normal levels during dry seasons, so much so that our boat had trouble passing. The warming climate not only dried up the water in the river but affected the water quality as well, leading to a noticeable drop in the number and diversity of wildlife species, according to the rangers of the national park.

The rise in temperature in South-East Asia, new research shows, can be attributed to deforestation.



3

I wonder: if a nature reserve (supposedly protected from the harms of tourism and commerce) cannot be spared the environmental consequences, what can?

The Alas River snaking through the Leuser Ecosystem is the life source for all living things that reside in the area, including the wildlife in the river and on land, as well as the people living in villages along the water.

“Sometimes people miss the point, we think that forest protection efforts are done to save the wildlife,” says Yunardi. Protecting the local ecosystem from exploitation also means protecting the livelihood of local communities that reside on the island. Yunardi says:

“The forest is very important to the people of Aceh because for generations they have depended very much



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2. Charred paradise. We took a pit stop on the side of the road on the way to Soraya Research Station. As I gazed into the distant greens, I noticed the smoke from a burning patch of land. Photo: Nicole Jao

3. Our first encounter with wild orangutans at Soraya Research Station. Photo: Nicole Jao

4. The stump of an oil palm at a recovery site near the Soraya Research Station. Photo: Nicole Jao

5. A truckload of oil palm fruits en route to the extraction facility. Photo: Nicole Jao

on the existence of the ecosystem for their livelihood – the source of water, the source of clean air, the source of food, and the source of medicines. Especially for the people living in surrounding villages, it is very important to protect the forest because it could mean that we are putting lives in danger.”

Continuing down the Alas River, at first glance, the shrubs and forests in the protected rainforest reserve appear lush and green, but shortly, signs of human disturbance were difficult to ignore: patches of land exposing bare soil underneath, the water in the river barely knee-high, and fishing boats whizzing by filled with palm oil seeds.

The rangers who have been traveling to the rainforest for several decades noted the intensifying dry seasons,

which caused the river's water quality to lower. Much of the wildlife in the forest and in the river, many critically endangered species, are losing their natural habitat. The Leuser Ecosystem makes up the largest carbon sink in Asia. Increasing deforestation and land-clearing activities have contributed to the rising temperature in the region, air pollution-related diseases, and even deaths.

Initiatives by local conservationists, activists, and indigenous groups are making efforts to slow down the accelerating process. Each of them possesses deep knowledge about the trees, the wildlife of the rainforests, and what keeps the ecosystem in balance. These groups have been doing their part by assisting international research studies about the local rainforest ecosystem, by promoting local

conservation activism, and by preserving natural resources in the area.

One of them is a professor at Banda Aceh. We nicknamed him “Mr. Butterfly” because he studies local butterfly species. He is a thinly-built Indonesian man with a signature mustache. He comes to Soraya Research station every few years for his study. He's filled with fun facts about the local insects such as the mud-puddling butterflies that suck essential minerals off damp patches of ground and the bees that build underground nests.

Another is Ibrahim – a research assistant with Leuser Conservation Forum – Forum Konservasi Leuser (FKL) that works with resident researchers coming from all over the world in their studies to help collect data. He has spent the past thirty years in the rainforests. He could



name out most of the wildlife inhabiting the forests, and the trees and the fungi that grow from the rainforest ground.

For Ibrahim, changes come through learning about the forest and understanding that each living thing helps maintain the fine balance of the ecosystem. Ibrahim believes through research and collaboration, there can be a positive impact on the forest ecosystem:

“Raising awareness can be done locally and internationally, having people from other countries that come here to conduct research and projects and share knowledge about what is happening on the ground is important.”

6. Ibrahim, research assistant with Leuser Conservation Forum (FKL), sorting through data of Orangutan food sources he collected for researchers residing at the Soraya Research Station. Photo: Nicole Jao

7. On the Alas River. Photo: Nicole Jao

Landscape restoration

Efforts to recover and preserve the Leuser Ecosystem has not been without tribulation.

The Soraya Research Station is one of the few things that survived the conflict in Aceh. It was burned to the ground during the turbulent period of political uprising, so badly damaged that it had to be closed down. It remained unoccupied for 15 years. Local organizations, including FKL, helped rebuild the research outpost and bring it into operation in 2017. During the turbulent period, the number of international researchers declined sharply.

However, today the conservation efforts have sprung into action. The organization set up “recovery sites” around monitoring outposts. At both Soraya and Suaq, they purchased

hectares of land from the owners of palm oil plantations, cut down the trees, and repopulated the area with seedlings of a mix of native trees and fruit trees such as durian, betel nut, and snake fruit trees. The wildlife is expected to come back to the restored land. They do so in collaboration with locals from neighboring villages, who get to keep all the proceeds from the fruits they harvest.

“It is a very positive result, yielded from years of conservation efforts, that researchers are traveling from Europe, the Americas, and other parts of the world to the Sumatra island to study orangutans and the local ecosystem,” says Subhan, camp manager at SUAQ Balimbing Research Station, which was born out of a collaboration between the University of Zürich, Sumatra Orangutan Conservation Project (SOCP), and the Universitas Nasional Jakarta (UNAS). The research station works



with international organizations, institutions, and local communities downstream on socialization and education projects. The camp runs an education program at primary schools in the area, which is expected to extend to middle and high school.

Conservation through art

Climate change is clearly one of the biggest challenges for our generation, and more than ever, there is a heightened awareness about rainforest protection, partly because of the 2019 fires that captured the world's attention. It is important for local activism and grassroots initiatives to roll into action, and for everyone to start learning more and participating in their own way to protect forests.

Learning and understanding nature is not purely a scientific process but also an artistic one. Whether it is through observing the visually rich patterns, shapes, and colors in a rainforest, or appreciating the rhythms and melodies made in the natural world, or simply letting ourselves be creatively inspired by the unruliness of the wild.

Our journey to Sumatra, organized by Suaveart, is part of a larger project that aims to inspire and encourage creators and artists like us who care about our natural habitat and hope to raise environmental awareness. ●

8. An art workshop at Soraya Research Station, where we compare different shapes, colors, and texture of fallen leaves, seeds, and branches collected from the forest floor. Photo: Yipei Lee

SEEDING FUTURE

Tropical Rainforest Research Project

is a multi-disciplinary, long-term program initiated by Suaveart. It aims to explore art, science and environment in the rainforest region together with curators, artists, scientists, researchers, journalists, and more. The second edition of Seeding Future to Leuser ecosystem will take place in August 2020. Sign up here:

www.seedingfuture.travel.blog

Cities4Forests

WE CONNECT CITIES WITH FORESTS FOR A HEALTHIER WORLD

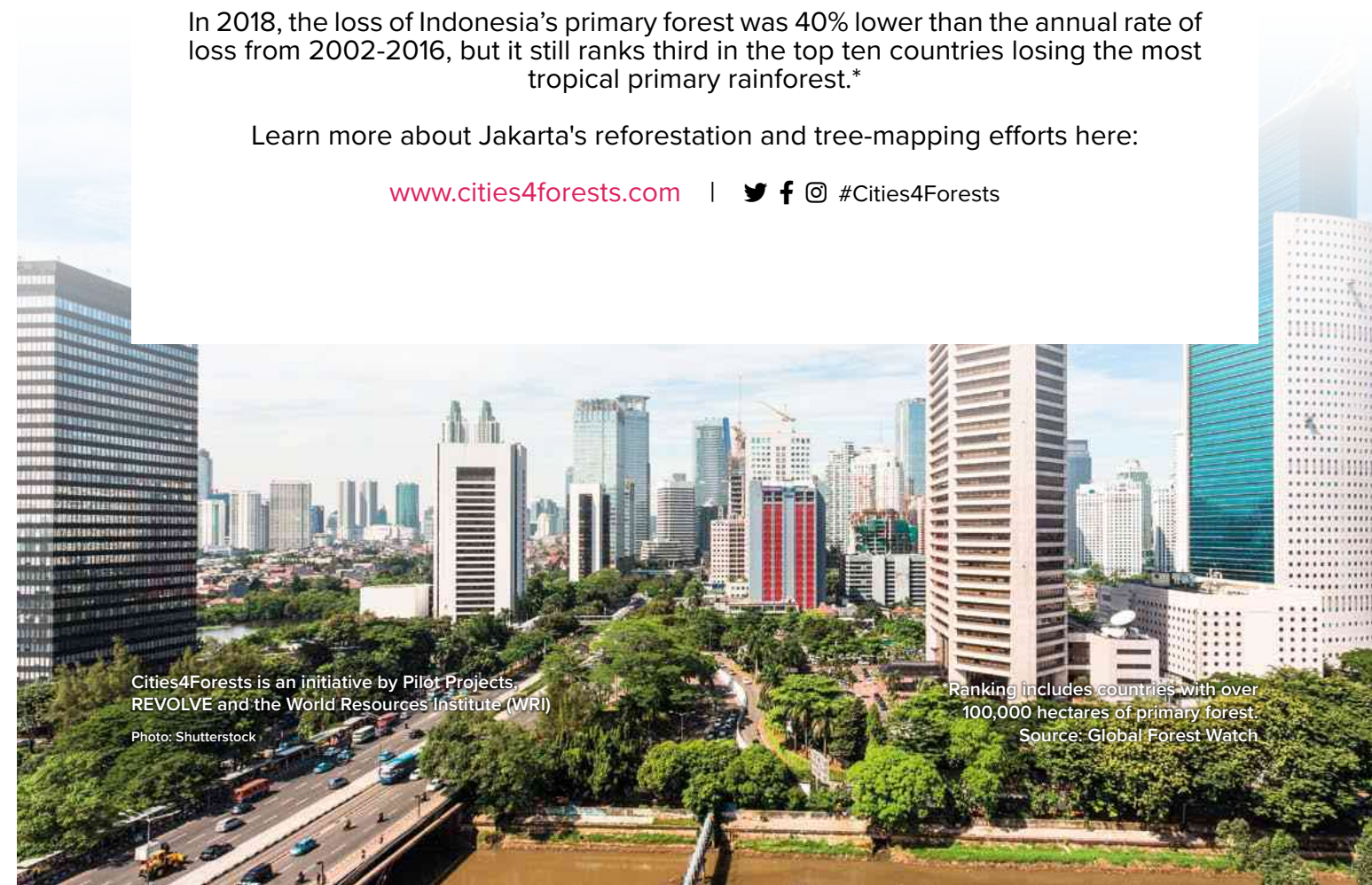
Every city, and our collective future, depends on healthy forests around the world. It is time for cities and their residents to join the global effort to conserve and restore forests — inside and outside city boundaries.

Jakarta x Cities4Forests

In 2018, the loss of Indonesia's primary forest was 40% lower than the annual rate of loss from 2002-2016, but it still ranks third in the top ten countries losing the most tropical primary rainforest.*

Learn more about Jakarta's reforestation and tree-mapping efforts here:

www.cities4forests.com | [Twitter](#) [Facebook](#) [Instagram](#) #Cities4Forests



Cities4Forests is an initiative by Pilot Projects, REVOLVE and the World Resources Institute (WRI)

Photo: Shutterstock

Ranking includes countries with over 100,000 hectares of primary forest. Source: Global Forest Watch



The EU Green Deal, Biodiversity and Forests: Ingredients for Success

WRITER: FANNY-POMME LANGUE

Our future relies on sustainably managed, resilient forests. The EU Green Deal is an opportunity to preserve biodiversity while realizing the major role European forests play in Europe's new growth strategy to achieve a fair and prosperous society and resource-efficient, competitive economy – void of net greenhouse gas emissions by 2050. Meeting these objectives can only be achieved if policy-makers follow a holistic approach to forest management.

The people behind the forests

European forests are not only trees, but entire ecosystems providing many different services beneficial to our environment, economy and social life. But before talking about forests and their benefits, we must first begin with a basic but important fact: forest management does not happen by itself – there are people behind forests. Meet them, as they live, breathe and grow with the resource they hold so dear. As forest caretakers, it is essential that policy-makers acknowledge their important role and secure their motivation.

The focus of European forest owners and managers is to maintain and enhance healthy, vital forest ecosystems, which continue to provide a diverse spectrum of goods and services to society. This is achieved by balancing the multiple aspects of forestry through implementing the concept of multi-functionality and



1. Taking a core sample of a tree in Sweden. Photo: CEPF
2. Squirrel in the tree tops of a Finnish forest. Photo: Markku Wilk
3. A group enjoys a forest outing in Germany. Photo: Franz Thoma
4. The Birds Directive (1979) is the oldest piece of EU legislation on the environment and one of its cornerstones. It protects 500 wild bird species, like the Eurasian eagle-owl. Photo: Aazad Abdulmohsin

sustainable forest management (SFM) – a concept widely defined according to criteria and indicators developed and agreed at pan-European level during the Ministerial Conference on the Protection of Forests in Europe. Exercised in daily management practices by forest owners across Europe, SFM principles ensure that our forests provide relevant services and will continue to do so in the future. Forest owners are also the ones making the management decisions and taking on the responsibility of all consequences related to these decisions.

In times when forests are gaining more attention in the EU and globally, the human dimension matters even more when we observe the private forest ownership structure in the pan-European region.

Firstly, private forest ownership, which mainly refers to small-scale forest owners, is subject to vast and diverse patterns, leading to multiple ways to manage forests today. The UNECE/FAO report of 2018 provides useful



insights into better understanding this situation, confirming that for the European private ownership today, fragmentation and parcellation are a challenge. The average size of a private forest holding in the EU is about 13 hectares. However, approximately two-thirds of the 16 million private forest owners – covering 60% of the EU forest area – have holdings of less than 3 hectares. The heterogeneity of forest owners spans culture, origin, age, gender, and values. Despite this, forest owners have a common objective – caring for their forests, preserving them and optimizing their use to pass on their forests to future generations. To this aim, forests are managed in the best possible way, taking into account their local environment and following national and regional legislations that encompass SFM principles.

Secondly, secured and acknowledged property rights are key to guarantee a long-term commitment and sound, sustainable land management by forest owners, adding to the prosperity and diversity of Europe's landscape.

In this context, when dealing with forest-relevant issues, the current and future EU policy framework should always recognize the achievements done so far and consider forest owners' possibilities and motivation to manage their forests and to gather their strengths in the future. Forest owners' early involvement in the various policy processes is therefore essential to make EU forest-related policies a success.

Biodiversity conservation and enhancement as an integral part of sustainable forest management

SFM encompasses three inseparable dimensions of the forest: economic, social and environmental. The latter includes principles that work towards the objective of biodiversity conservation and enhancement. Only by attentively enabling functioning ecosystems, forest owners will be able to ensure long-term management of their forests. This makes sense, as forests are irreplaceable reservoirs of more than 15 ecosystem services, biodiversity being one of them. They also provide wood-based materials and non-wood forest products, carbon sinks and clean water through filtration. They clean the air, prevent soil erosion and play a central role in risk reduction measures vis-à-vis natural disasters, such as floods, droughts, heatwaves, erosion or landslides. They also support outdoor leisure, recreation, spiritual values and cultural services, particularly in densely populated areas, and provide economic and job opportunities to local communities, contributing to vibrant rural areas.

Essential for the conservation of Europe's biodiversity, forests protected under Natura 2000 include various types of semi-natural habitats. Most of them are characterized by a long history of forest management. Needless to say, forest ecosystems are bound to dynamic and long-term processes in nature and require legislative certainty and sustainability of long-term investment for their management.

The EU's ambition to lead globally on the next steps to curtail the global biodiversity loss will be translated in the coming EU Biodiversity Strategy to 2030 as part of the European Green Deal.

Considering the many indispensable services that forests supply, the future EU initiative on biodiversity needs to be done right - as an enabling strategy that acknowledges multifunctional forests and encompasses adequate tools.

Biodiversity preservation at the cross road of climate change mitigation and adaptation

Current EU policy discussions highlight the question on how climate change mitigation and biodiversity preservation can go hand-in-hand.

On one hand, Europe's forests are vital for mitigating climate change through providing three main climate benefits: CO₂ sequestration in resilient, growing forests; carbon storage in wood products; and substitution of fossil-based materials and fuels with a renewable and climate-friendly raw material. In this view we talk about the three S's: sequestration, storage and substitution. Forest ecosystems work in a green carbon cycle, and SFM is crucial in maintaining and enhancing this carbon cycle. Biodiversity preservation enables forests to remain healthy and is therefore a condition for forests to deliver on these benefits.

On the other hand, forests are seriously affected by changing climatic conditions, which limits their mitigation potential and increases their potential emissions. This not only represents a serious danger for the climate change mitigation, biodiversity and environment conservation, but is also a threat for human life and the viability of rural areas. The occurrence of natural disturbances such as fires, storms, pest and disease outbreaks, extended drought periods and heatwaves are



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increasingly reported by forest owners and are projected to further increase due to climate change. Sustainable, adaptive forest management represents a solution to counteract the negative tendencies, preserves biodiversity and improves the resilience of our forests to changing climatic conditions which enables higher carbon sequestration and as such, provides more primary material to substitute carbon-intensive materials and energy.

The future is not one-size-fits-all

The EU is home to a wide variety of forest ecosystems, each with their respective challenges including a growing intensity of various climate

change-induced threats. Forests need to remain managed and adapted according to the national and local conditions and so should the EU commitments and measures, based on a bottom-up approach, in order to take into account relevant specificities of each Member State.

To develop an ambitious, yet realistic, EU2030 Biodiversity Strategy, previous achievements in national biodiversity conservation should be considered. In view of the challenges linked to the practical implementation of the existing and future EU legal and policy framework on biodiversity, it is important

5. In Portugal, cork trees management combined with agro-pastoralism allow to enhance biodiversity. Photo: Diogo Marecos Duarte

6. Water filtration is one of the many ecosystem services that forests can provide. Photo: Hélène Koch



6

to underline the need for a participatory planning and implementation, appropriate financing and flexibility on national and local levels. Most importantly, realistic definitions and the level of ambition of the targeted instruments and appropriately funded measures on biodiversity expected in 2021 will be key for the endorsement and involvement of forest owners. Valuable to the process will be a final outcome of the evaluation of the current Biodiversity Strategy which should disclose successes and failures in the implementation of the Biodiversity Strategy to 2020 and recognize the challenges we have faced during this period.

In the coming months, the European Commission will start working on the EU Forest Strategy post-2020. Forest issues are fragmented across many different areas and sectors, among others as part of agricultural, environment, climate and industrial policies, and thus require a robust framework for a consistent and well-coordinated action at EU-level. A revised EU Forest Strategy post-2020 should, therefore, serve as the cornerstone to address holistically the many cross-cutting challenges of the forest sector, including biodiversity, with SFM to be given a key role in this policy landscape.

Especially in times of changing climatic conditions that impact our forests severely, we would like to encourage you to see the forests and all related initiatives in a coherent, holistic and balanced way. In these very crucial times for the forests in Europe, the Confederation of European Forest Owners is looking forward to further collaborate and seek synergies with partners as well as contribute to the next step of all processes related to forests and biodiversity. ●

Facts about European forests

- 182 million hectares (42% of EU land area) are covered by forests
- Over the last 25 years, forests have grown by 9 million hectares, the size of Portugal
- 60% of forests are privately owned by nearly 16 million forest owners
- 90% of timber supplied to the EU wood industry originates from EU forests
- 50% of Natura 2000 network area is forest
- 90% of forests are available for recreational purposes

Earth

The final season?

#EUGreenWeek
1–5 JUNE 2020

IN 2020, SAVE NATURE TO SAVE OURSELVES!



#EUGreenWeek 2020, 1-5 June

All around the globe, biodiversity is disappearing as a result of unsustainable human activities. This loss is closely connected to climate change, and the combined effect of this crisis is disrupting the ecosystems that support life on Earth. While the situation is extremely serious, there is still hope! Solutions exist, but we need strong action as soon as possible – deep and transformative changes in the way we produce, consume and trade.

EU Green Week 2020 will put the spotlight on this ongoing crisis. It will call for urgent action, explore pathways for change, and examine how EU policies like the European Green Deal can help protect, restore and sustainably manage nature, leaving room for it to recover and thrive.

This year's EU Green Week will be a milestone on the path to the 15th Conference of the Parties of the UN Convention on Biological Diversity (CBD COP 15) to be held in October 2020, where world leaders will adopt a new global deal for people and nature, in the form of a 10-year action plan for biodiversity.

EU Green Week 2019 will include events across Europe, with the official opening event on 1 June in Lisbon and a high-level summit in Brussels from 2 to 5 June.

How can you participate?

1. Organise or take part in one of the many partner events that will happen across Europe between 4 May to 14 June. The call for proposals for **Partner Events** is now online, and you can apply to register your event at: <https://www.eugreenweek.eu/en/register-your-partner-event>. Check the guidelines on the partner events page for more information.
2. Join us in Brussels at the conference which will take place from 2 to 5 June. Registration for participation at the Brussels conference will open at the end of March 2020.
3. Visit [eugreenweek.eu](https://www.eugreenweek.eu) or follow EU Environment on [Twitter \(@EU_ENV\)](https://twitter.com/EU_ENV) to stay updated!



Ant Forest Plants Trees For Sustainable Behavior

WRITER: VING WU

Alipay is the world’s largest digital platform for gathering data on people’s efforts to reduce their carbon footprints. Through its Ant Forest add-in, users are rewarded ‘green energy’ points for sustainable behaviors such as making online purchases, taking public transport, and bike-sharing through Alipay. Over 500 million users are active on Ant Forest and over 100 million trees have already been planted, reducing carbon emissions by nearly 8 million tons.

This is the story of Ving – a resident in Hangzhou, China – an avid Ant Forest user.

With the Ant Forest add-in available through the Alipay app, users can grow a virtual tree by collecting energy points. The energy earned shows up as a balloon next to the virtual tree on your profile, which appears 24 hours after you’ve completed a sustainable behavior. You have to manually ‘harvest’ or transfer these points, or they will fade away after 72 hours without collection. On the platform, you can also visit your friends’ virtual trees and claim part of the energy they have not collected on time. Once a certain amount of total energy had been reached, you can exchange that energy to plant a real tree in China – choosing not only the type of the tree, but where to plant it based on the menu and your energy capability. After you “plant” a new tree, it will take a while until a foundation “adopts” your tree into their project and plants a real tree with a unique code.

**

I obtained my first tree on the Ant Forest add-in on 18 December 2016. I still remember how happy I was after getting up early, walking a long distance and using Alipay to purchase my train tickets, cinema tickets, and eventually earned my very first 1,7900 grams of energy to plant a tree in the Alxa Desert – located in the western part of the Inner Mongolia Autonomous Region of China. It took me roughly one month.

Since then, Ant Forest has been part of my life. I started to get up every day at 7:24 AM because that was the time I had to collect the daily energy I had created the previous day, and also the time I could steal some energy from others who were behind with their energy collections. I built a habit of paying with the Alipay app. I started to use public transportation: bus, subway, and shared bikes – each action I take that contributes to saving energy gives me 52 grams of green credits. If I recycle my electric devices and home appliances through Alipay, I can get up to 1.1 kg



1. Eight users invited to visit Alipay Ant Forest. Photo: Ant Financial Services Group
2. Ving Wu's very first tree certificate. Screenshot of the Alipay App.
3. List of Ving Wu's tree certificates. Screenshot of the Alipay App.
4. List of all the behaviors rewarding users with energy points. Screenshot of the Alipay App.

“I started to use public transportation: bus, subway, and shared bikes – each action I take that contributes to saving energy gives me 52 grams of green credits.”

of credits at once. I have never used this function, but I am very jealous of those who get that much energy!

After a while, more desert and protected lands were identified for energy donation and, of course, every time I participate in planting trees I try to collect each type of tree available on the list. Not only that, I also try hard to stay on top of the total energy ranking list and be the best amongst my friends who are also participating in this massive sustainability game, because it is free and a very big project that is just too easy to be part of. I had to delete one of my friend’s contact because her record was just way too high to catch up to, and not only that, she used to steal my energy right before I could collect them. I also deleted a few others that did the same thing with me after calculating the gain and loss (if I can steal more than they steal from me). Because the quantity of grams you can steal from a friend is random, I would get super happy if I could steal 50 grams out of someone’s 250-gram balloon but would become sad if it was just 1 gram instead.

Power in numbers

One day, I went into the Ant Forest page and I saw a little banner beneath my tree: “Come check the tree you planted.” Out of curiosity, and boredom, I clicked the link. I saw a video with thousands of very little trees planted in the desert. At that moment, I felt somewhere in my heart little fireworks going off. I certainly wanted to see more updates on what I did, so I followed the public account of Ant Forest and started to get to know the progress of those projects. And I have to say: seeing the result of something I had just did for fun made me so happy.

One online article showed footage from a surveillance camera capturing cheetahs that were curious about the trees and



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another one showed a cheetah mother with her two baby cheetahs. Other images showed desert animals eating some saplings that we had planted. Then another one told us that farmers in the area were also benefiting from being able to sell sea buckthorn juice with Alibaba, all over China. The Ant Forest Project team set up cameras everywhere to watch and show the status of our forests, to see what has changed over time.

Understanding the meaning of the Ant Forest Project, I got even more into it and I started to promote it with my friends, co-workers, even my parents that barely know how to use a smart-phone. I like it so much that what I do has a small contribution to make the desert smaller and bring back biodiversity and environmental benefits for animals (and people).

On 18 November 2018, 12 other friends and I successfully planted a Pinus Sylvestris in the Chifeng Area in north-west China. To plant this tree, we gathered 146,210 grams of energy – enough for me to plant 8 haloxylons – but obviously Pinus Sylvestris is bigger and way cooler. Before we managed to complete this co-planting, my friends and I would wake up very early and try everything we could to get green energy so we could water our joint virtual tree 500 grams per day.

- 5. Using public transportation like shared bikes grants users energy points. Photo: Ant Financial Services Group
- 6. Electronic Scarecrows in Alipay Ant Forest shoot photos every day and send them back to users. Photo: Ant Financial Services Group
- 7. Haloxylon Ammodendron planted in Alipay Ant Forest. Haloxylon is a genus of shrubs or small trees native to the deserts of central Asia. Photo: Ant Financial Services Group
- 8. Certificate of the Pinus Sylvestris planted in north-west China by Ying Wu and her friends. Screenshot of the Alipay App.
- 9. Pinus Sylvestris. Photo: J.-H. Janßen



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PERSONAL TESTIMONY

Then one day I received a nudge notification saying that I got a reward. I clicked the notification and it said that the Chinese initiative Alipay Ant Forest had won the UN Champions of the Earth Award – and I was a part of it! The notification stated that up until August 2019, half a billion people created 7.92 million tons of carbon emission reductions by planting 122 million real trees – equal to the surface area of one and a half times the size of Singapore! This glory belongs to each and every one of the half-a-billion users.

The UN Champions of the Earth prize is an annual prize awarded to outstanding leaders from government, civil society and the private sector whose actions have had a positive impact on the environment. Since 2005, Champions of the Earth has recognized 88 laureates, ranging from world leaders to technology inventors.

And when I think back, I realized this all started with a game – and if it wasn't a game, I probably would have never laid an eye on the desert or thought about what I could do to contribute to the environment. Just like anyone, I would think my own individual behavior would be too small of a contribution to make a difference. With the design of the Ant Forest Project, I started to gain knowledge of what our Earth is facing, and what each of my actions means for carbon emissions. And also, I learned that to make Earth a better place, each of one of our small actions counts.



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Check out Ving's video log on how to operate the Ant Forest on www.revolve.media



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10. Farmers planting trees for Alipay Ant Forest. Photo: Ant Financial Services Group

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The Hidden Art of Agroforestry

Aside from aesthetics, there's nothing particularly striking about trees on an agricultural landscape – or is there? Senior science policy advisor of the World Agroforestry Centre (ICRAF), Patrick Worms, tells REVOLVE why there's far more to agroforestry than meets the eye and why its practice will continue to play an increasingly crucial role in climate-resilient farming practices.

INTERVIEW WITH PATRICK WORMS

What is agroforestry and why is promoting it important?

Agroforestry is the art of mixing trees with crops or pasture in order to obtain direct or indirect benefits that translate into higher resilience and higher productivity - and thus a better, more predictable income. We tend to think of agroforestry as adding trees to agricultural lands, but it can also be the reverse: adding agricultural or livestock components to forested lands as long as the end result combines trees with other crops or livestock in a way beneficial to all parts of the system.

Agroforestry is essential to our future, both in terms of food and fiber security and climate mitigation and adaptation. There are two key things to remember about agroforestry. First, it generates more biomass from a given piece of land; and second, it boosts resilience to extreme weather such as floods and droughts. Secondly, agroforestry allows us to grow more food and fiber without converting more land to the plough or plantations. More importantly, it allows us to do so even during the increasing weather extremes caused by climate change that make growing monocrops more difficult.

In the EU, around 16 million hectares are occupied by some kind of agroforestry system – or 10% of all agricultural areas. How can we better identify these agroforestry systems?

As agroforestry is perhaps the most wide-ranging of agricultural management techniques, it is complex to define. Because of this, it can easily be regarded as something you'll just know once you see it.

It encompasses everything from the thousands of kilometers of identical windbreaks of the Soviet Union to the exuberant multi-story Chagga gardens on the slopes of Mount Kilimanjaro. It ranges from Maasai herders on the wooded savannahs of Kenya – to the Bellota pigs rooting for acorns in Iberian dehesas – to the Arctic reindeer herded across the taiga. It has saved millions of Nigeriens from famine through farmer managed natural regeneration (FMNR) and is revolutionizing cereal cultivation through alley cropping. Thus, defining what exactly constitutes an agroforestry system and what does not is tricky. The European Union, the FAO, the United States Department of Agriculture, India and a dozen other countries each

have their own definitions – largely overlapping but not coinciding. The one proposed by the EU gets close, however: it defines agroforestry as a “land-use system in which woody perennials are maintained or planted, in some form of spatial arrangement or temporal sequence, on the same land as agricultural crops and/or livestock.” (Source: EEA Glossary)

The presence of trees in landscapes is typically well perceived by society; trees also offer multiple environmental benefits such as carbon storage, soil retention, and improvement of air quality. Why then are farmers in the EU not implementing agroforestry despite the EU offering financial support?

Farming is a difficult business. Let us never forget that it is probably the only trade where most practitioners work extremely long hours to fail to make a minimum wage. Farmers must be conservative to have a chance of surviving this season and growing next season. Furthermore, their experience of extension over the past 40 years has been overwhelmingly negative. They followed

the advice to invest ever more, buy ever bigger tractors, ever more fertilizer and pesticides, in a desperate race to avoid bankruptcy. But for most farmers it was in vain: every year, more and more farmers must wrap up their affairs and sell up. European farmers are already, on average, in their late 50s; the price of land is being driven up by speculators, making it extremely hard for younger farmers to become established, and the discourse in the farm supply shops is dominated by the messages of those who have the most money to spend on marketing – namely the sellers of inputs and machinery.

In addition, EU member states are not applying EU rules regarding agroforestry uniformly. Farmers have sometimes been prevented from receiving their Pillar 1 payments for having had the temerity of planting trees in their field. Such stories, rare though they are, spread, and act as a massive barrier to agroforestry extension.

In such conditions, it takes a courageous farmer to try something new and unusual such as planting trees on her land.

The new EU Common Agricultural Policy (CAP) is taking shape. The past CAP (2014-2020) included measures to promote the implementation of agroforestry systems but were not really successful. What are you proposing for this new CAP version and how can it be related to the EU Green Deal?

This year is a crucial one for agroforestry in Europe.

First, the entire architecture of the CAP will be changed. Much of the detailed rule-crafting and decision-making will be repatriated to the Member States, who will have to explain how they plan to meet broad European objectives through so-called strategic plans.

Second, the European Union is finally beginning to take climate change almost as seriously as the emergency demands, aiming for Europe to become a net-zero continent by 2050. The European Green Deal is the signature policy of the new commission president, Ursula von der Leyen, and

its details are being fleshed out now. Crucially, it counts on agroforestry to help deliver net-zero: “The Commission will work with the Member States and stakeholders to ensure that from the outset the national strategic plans for agriculture fully reflect the ambition of the Green Deal and the Farm to Fork Strategy. These plans should lead to the use of sustainable practices, such as precision agriculture, organic farming, agro-ecology, agroforestry and stricter animal welfare standards.” And these are not mere words: The Commission has plans to raise €1 trillion to finance the transition.

1. A dehesa - a unique ecosystem made up of mixed grassy pastureland and woodland of evergreen oak trees. Dehesas are among the best preserved low-intensity farming systems in Europe, and in them the integration of traditional land-use and biodiversity conservation is considered an exemplary land use management. At present, dehesas occupy 2.3 million hectares in Spain and 0.7 million hectares in Portugal (where they are called "montados"). Photo: Juan Glez



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In that context, EU policy needs to pursue the following eight goals:

1. **Promote agroforestry:** Agroforestry must be specifically promoted to support the Sustainable Development Goals, the Paris Climate Goal, and key national and international targets.
2. **Support agroforestry:** Agroforestry must be supported through Pillar I of the Common Agricultural Policy, and everywhere – on arable land, on permanent grasslands, and in permanent crops.
3. **Celebrate agroforestry:** The new CAP must group together, and integrate as “agroforestry,” the many measures that support the small-scale use of trees in Pillar II on both agricultural and forest land.
4. **Recognize agroforestry:** Member States and the EU should report the extent of agroforestry through their annual “report indicators” and quinquennial “impact indicators”.
5. **Monitor agroforestry:** Many countries have afforestation targets but neglect agroforestation and regeneration of existing agroforestry features, such as hedges. These could greatly increase tree cover, while reducing the financial and fiscal drawbacks of afforestation for farmers.
6. **Distribute agroforestry tools and knowledge:** The Commission is making a GIS “Farm Sustainability Tool (FAST)” available to all EU farmers. This should be modified to include the impact of farm-trees on nutrients and GHG emissions
7. **Use agroforestry for a better climate:** Ensure that agroforestry is included by every Member State in annual emissions reporting to the UNFCCC.
8. **Resist creating forestry versus agriculture silos:** Prevent Member States from excluding forestry measures, including agroforestry, from their CAP Strategic Plans and from their annual CAP reporting requirements. ●

Pillar 1 of the CAP concerns the direct income support payments that go to farmers from the EU; pillar 2 of the CAP requires co-financing from Member State governments to further competitiveness, sustainable management, the combating of climate change and supporting of rural economies (Source: Institute for Government)

2. Trees with arable crops & grassland, Sissani, Macedonia, Greece. Photo: Anastasia Pantera

3. Chagga garden and Mount Kilimanjaro. A Chagga garden is a complex multi-cropping system integrating numerous multipurpose trees and shrubs with food crops and animals. Vertically, the following four stories/canopies can be distinguished: food crops, coffee, bananas and trees. Photo: Patrick Worms

4. Alley cropping of hazel and potatoes at Wakelyns Agroforestry, Suffolk UK. Photo: ORC for AGFORWARD project

Read the full interview:
revolve.media

VIEWS

Backing Biodiversity

This year signals the end of the Decade on Biodiversity (2011-2020). The goals of the Convention on Biological Diversity (CBD) – to protect biodiversity, to use components of biodiversity sustainably, and to share the benefits arising from genetic diversity equally – will be carried over into a post-2020 global biodiversity framework to fulfil the 2050 vision of **Living in Harmony with Nature**. In this vision, biodiversity is valued, ecosystem services maintained, and a healthy planet sustained, thereby delivering benefits for all.

In October 2020, the 15th Conference of the Parties (CoP) to the CBD will convene in Kunming, China, in order to work towards this long-term vision based on the progress made over the past decade. In parallel, the UN Decade on

Ecosystem Restoration (2021-2030) will further catalyze efforts to blend landscape restoration with biodiversity conservation.

To take stock of the achievements that have been made in biodiversity work, this VIEWS focuses on the work of the UNDP's global biodiversity program. Throughout the UN Decade on Biodiversity, the UNDP has helped address biodiversity loss and ecosystem degradation in 3,000 protected areas spanning 680 million hectares in more than 140 countries, providing development planning to more than 250 million hectares of productive landscapes and seascapes around the world in order to preserve biodiversity. Here are highlights of their work across Asia.

▲ Thailand

From 2011 to 2020, up to 119 cranes were released to the wetland areas of Huay Chorakae Mak and Sanam Bin reservoirs in Buriram Province, Thailand. The release of the Eastern Sarus Crane back into the wild is a landmark success of wildlife conservation.

Photo: UNDP

Pakistan

Pakistan has only 5% forest cover, but is highly rich in both ecosystem and species biodiversity, where such ecosystems are still intact. However, unsustainable forest management practices and a high dependency of local communities on forests to meet a wide variety of needs often results in deforestation and degradation of forest ecosystems.

The Sustainable Forests Management (SFM) Project was launched as a joint venture financed by the Global Environment Facility (GEF) through UNDP, and implemented by the Ministry of Climate Change through provincial forest and wildlife departments in Sindh, Khyber Pakhtunkhwa, and Punjab provinces. The project promotes SFM in Pakistan's Western Himalayan Temperate Coniferous, Sub-tropical broadleaved evergreen thorn (scrub), and Riverine forest types, for biodiversity conservation, mitigation of climate change, and enhancement of ecosystem services for local communities.

These project efforts support Pakistan's broader ambitious goal to plant 10 billion saplings. On 2 September 2018, the government held 200 launch ceremonies across the country, enthusiastic citizens helped plant 2.5 million saplings in one day.

Extracted from 10 Billion Trees – Reversing deforestation, tackling climate change and managing forests sustainably in Pakistan photo essay:
undp-biodiversity.exposure.co/10-billion-trees

Original text by Andrea Egan, Wonhyeop Shin, David Angelson, Tashi Dorji, Mohammad Ayaz Khan and Muhammad Sohail

Photos: UNDP Pakistan, Frida Bredesen, Hammad A. and Usman Azher on Unsplash.

Thailand

Thailand's rapid development over the last three decades has led to the over-exploitation of natural resources, land degradation, loss of habitat, and increased water and air pollution. 575 native species are listed on the IUCN Red List of globally threatened species and 1,058 are nationally threatened species on Thailand's Country Red List.

Conserving Habitats for Globally Important Flora and Fauna in Production Landscapes project has strengthened laws and policies, improved co-ordination and monitoring of

critical habitats for endangered species and has helped conserve the habitats of three endangered species in three areas: the Eastern Sarus Crane, the Spoon-billed Sandpiper, and the Water Onion – colloquially referred to as 'water lily'.

Extracted from Co-Operation for Co-Existence – Yielding success for three endangered species in Thailand, conserving productive habitats, and finding solutions that are mutually beneficial for people & planet photo essay:
undp-biodiversity.exposure.co/cooperation-for-coexistence

Original text by Andrea Egan, Apiradee Treerutkuarkul, Nucharee Puethkhon, Orn-oniriy Fugthaworn, Supranee Kampongsun, Usaras Janpakdee, Yenta Nungvaewdaeng, Napaporn Yuberk

Photos: UNDP Thailand.

China

The Altai Mountains includes forests, grasslands, and wetlands of the Urungu River, and is the source of the Irtysh River. It provides water to the northern part of Xinjiang, vital to both people and wildlife in the region. But the increase of human activities such as overgrazing, infrastructure construction, tourism development, and mining are threatening biodiversity.

Funding from the Global Environment Facility (GEF) and UNDP support there have led to significant reductions in the threats to global biodiversity from incompatible development projects, resulting in an additional protection of 150,000 ha of terrestrial landscapes. Improvements were also made in protected areas management, institutional capacity, and financial sustainability.

Extracted from Common Threads - Protecting the Altai Mountains and wetlands in Northwest China photo essay:
undp-biodiversity.exposure.co/common-threads

Original text by Andrea Egan and UNDP-GEF Altai Project

Photos: UNDP China



▼ Buriram Province, Thailand

The Eastern Sarus Crane was thought to be extinct in Thailand due to habitat loss and damage to its natural habitat. They have now been successfully reintroduced into their natural environment at three wetland complexes in Buriram Province.

Photo: UNDP Thailand



▼ Pakistan

Finding solutions for fuel and water needs for the local community would transform how neighbouring forests are used. Four bio-gas plants were installed to meet the local communities' energy needs – obviating the need to collect firewood in an ever-expanding radius.

Photo: UNDP Pakistan





▲ **Pakistan** The diversity of wildlife ranges from the Blind Indus Dolphin in the South, to the Snow Leopard in the rugged mountains in the North. (illustration photo). Photo: Frida Bredesen

▼ **China** Xinjiang – China's largest province – is a significant reservoir of biodiversity, with diverse landscapes and rich ecosystems. Photo: UNDP China



▲ **China** The beaver – the fairy of Ulungur River. Photo: UNDP China

▼ **Thailand** Water onion at project site in Ranong and Phang Nga provinces. Photo: UNDP Thailand



▼ Babusar Top, Mansehra

Forest degradation in Pakistan has negatively impacted communities, ecosystems, and biodiversity.

Photo: Hammad A.





▲ **Ertix River, China** In 2018, the Xinjiang Uighur Autonomous Region (XUAR) government issued a year-round fishing ban in all natural rivers in the Altai region, including the Ertix River. Photo: UNDP China

▼ **Sandaohaizi, China** Wetland during winter. Around 170 families (approx. 40,000 livestock) graze in the ecologically sensitive Sandaohaizi wetland during summer. Photo: UNDP China

▲ **Grand canyon of Ertix, China** The Ertix River originates in the Altai Mountains in China and is the only river in China that flows to the Arctic Ocean, after flowing through Kazakhstan and Russia. Photo: UNDP China



▼ Thailand

Collaborations are vital in ensuring the survival of three endangered species in three areas (the Eastern Sarus Crane, the Spoon-billed Sandpiper and the Water Onion). Local food producers - rice farmers, fruit and rubber orchard owners, and sea salt harvesters all play an important role in this process.

Photo: UNDP Thailand





▲▼ Pakistan The Sustainable Forests Management (SFM) Project support Pakistan's broader ambitious goal to plant 10 billion saplings. Photo: UNDP Pakistan



▲▼ Pakistan In 2018, 43 different awareness events were held highlighting different aspects of sustainable forest management. More than 600 community members and officials from the forest and wildlife departments attended. Photo: UNDP Pakistan



▼ Thailand

Salt farming methods and processes have created ecosystems particularly well-suited for feeding and sheltering migratory shorebirds. The bad news is there are just 28 salt-farmers left in the Khok Kham community. If salt farming disappears, it will render the return of the Spoonbilled Sandpiper unlikely. The recognition of symbiosis between bird and farmer is key to preserving biodiversity via sustainable development.

Photo: UNDP Thailand



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Agroforestry and Biodiversity

INTERVIEW WITH JO SMITH

Nearly one million species are currently at risk of extinction. This startling fact demands that we rethink how we manage urban and agricultural areas that largely cause habitat loss and degradation. Agroforestry researcher Jo Smith discusses how agroforestry prioritizes biodiversity while addressing our agricultural needs.

Biodiversity in crisis

The biodiversity crisis was one of the headline stories of 2019 when the sobering state of our natural world was exposed by the IPBES Global Assessment Report on Biodiversity and Ecosystem Services (IPBES 2019). The report highlighted that up to one million species are at risk of extinction – many within decades – unless action is taken to reduce the intensity of drivers

of biodiversity loss. With over three-quarters of the world's land surface severely altered by the conversion of forests, wetlands and other wild landscapes into agricultural land and urban areas, we need to rethink the way we manage these human environments to make space and provide resources for our wildlife. While conservation efforts have previously focused primarily on attempts to conserve 'pristine' nature in protected areas such as national parks, with the continued – and even accelerating – loss of biodiversity, it is clear that this approach alone is not enough to stop the loss of our wild species. The importance of the quality of the landscape that surrounds these protected areas is being increasingly recognized. Agroecological approaches such as organic farming, permaculture, regenerative agriculture and agroforestry are seen as sustainable farming systems that can support biodiversity while also producing food and fiber. These systems emphasize the application of ecological principles and practices to the design

and management of farmland, integrating the long-term protection of natural resources as an element of food, fuel and fiber production.

Agroforestry supports biodiverse landscapes

Industrial agricultural landscapes are usually viewed as hostile to wildlife, with a low permeability that restricts movement of species between isolated patches – or islands – of natural or semi-natural habitats. The role of agroforestry in improving the quality of the landscape has only recently been investigated although the value of scattered trees as keystone species in agricultural landscapes has been recognized previously. The ability of agroforestry to act as corridors allowing for the movement of species through landscapes will become of increasing importance under predicted climate change scenarios.

As ecosystem engineers and keystone species, trees provide a range of resources to other flora and fauna and when integrated into agricultural land, they can enhance structural diversity and habitat stability of the landscape. Agroforestry systems by their very nature are more diverse than monocultures of crops and livestock; this increase in 'planned' biodiversity i.e. the components chosen by the farmer, increases the associated biodiversity i.e. the wild plants and animals present on the farmland.

There has been a lot of research investigating the role of agroforestry in supporting biodiversity. These studies demonstrate that agroforestry systems support communities of plants and animals that can be as species-rich, abundant and diverse as forests. While agroforestry systems are unlikely to provide habitat for specialist forest species that require large tracts of undisturbed forest or woodland, they can support biodiversity in otherwise open landscapes and allow movement of species between habitat remnants, as well as buffer protected areas from the impacts of more intensive systems.

Windbreaks, shelterbelts and hedgerows are often the only woody habitats in an otherwise homogeneous agricultural landscape in some areas, particularly in parts of the United States. As well as providing shelter for wildlife, they also provide food and nesting resources and act as movement corridors through the agricultural landscape. For example, connectivity, habitat availability and local structure of the hedgerow system have been shown to be important predictors of small mammal populations in lowland farmland in Britain; these animals make their homes in hedgerows, rather than just using them for migration, demonstrating the importance of these linear woody features in landscapes otherwise devoid of wooded habitats.

The impact of agroforestry on biodiversity may extend beyond the landscape-scale; there is a correlation between decreasing populations of songbirds in eastern USA and the elimination of shade trees from coffee agroforests in Latin American countries. Those species in decline were migratory species that overwintered in the southern countries and were found in the forest-like habitats of traditional coffee farms with a diversity of shade tree species.

A keystone species is critical to the survival of the other species within the ecosystem; without them the ecosystem could not survive.

Source: National Geographic

By supporting higher levels of biodiversity, agroforestry systems may benefit from the ecosystem services biodiversity provides, for example, pest control, which can lead to the use of fewer pesticides. Reduced pest problems in agroforestry systems can be attributed to a number of mechanisms including scattered distribution of host plants makes it more difficult for pests to find the plants; one plant species acting as a trap-crop or as a repellent which protects the other crop from herbivore attack; one plant species acting as a repellent to the herbivore; higher predator and parasitoid densities due to higher plant diversity and increased interspecific competition between pest and non-pest species. Trees, hedgerows and other permanent non-cropped areas of agroecosystems provide shelter for

overwintering natural enemies such as beetles, spiders and wasps, as well as alternative food sources when crop pest populations are reduced following harvest. However, some pests such as slugs have been observed in higher numbers in agroforestry systems because of the permanent vegetation under the trees and shifts in relative importance of pest groups may present novel management problems and influence crop choice.

Farmers can increase the value of agroforestry systems for biodiversity through careful design and management, for example by planting trees adjacent to protected areas to increase landscape connectivity and buffer from agricultural impacts, planting a diverse mixture of trees and shrubs, and sowing a flower-rich mixture underneath the trees.

Despite the many benefits of integrating trees into agriculture, agroforestry is not yet commonly practiced or known. Three key areas essential for promoting agroforestry into the mainstream are research, knowledge exchange and policy. Activity is increasing in all three, supported by agroforestry research organizations such as the World Agroforestry Centre and regional associations including the Association for Temperate Agroforestry in North America, the European Agroforestry Federation and its affiliated country associations, and the recently launched International Union of Agroforestry.

For more information and examples of agroforestry across Europe, visit the European Agroforestry Federation website. ●

1. Hedges as corridors. Berkshire UK

Read the full interview:
● revolve.media

History and Hustle: Urban Agriculture in the Bronx

WRITER: **SHRUTI MANIAN**

A small, youth-led urban farm offers insights into the renaissance of urban agriculture in one of New York City's most food insecure and impoverished neighborhoods.

On a bright but chilly Friday in the first week of November, students, teachers and school administrators gather to celebrate the Morris Campus Educational Farm's second annual harvest festival. The farm's compact 14,000-square foot expanse is dotted with plant beds, a half-done greenhouse and an herb garden still in bloom thanks to New York's unusually warm fall.

Tables laden with small portions of food are lined up next to the farm's entrance. "Come on over, you gotta try some of this curried cauliflower soup!" a woman in a chef's uniform calls to a small group of high school students, beckoning them closer to the tables.

"I don't know about this, I usually like fast food," says a girl as she sniffs doubtfully at the cauliflower concoction in front of her.

"The only thing is, your body can't process so much fast food, and no one will see it until you're in the emergency

Growing food in community gardens became a way for people to preserve the heritage of the homes they had left while forming new ties in the homes they had chosen.

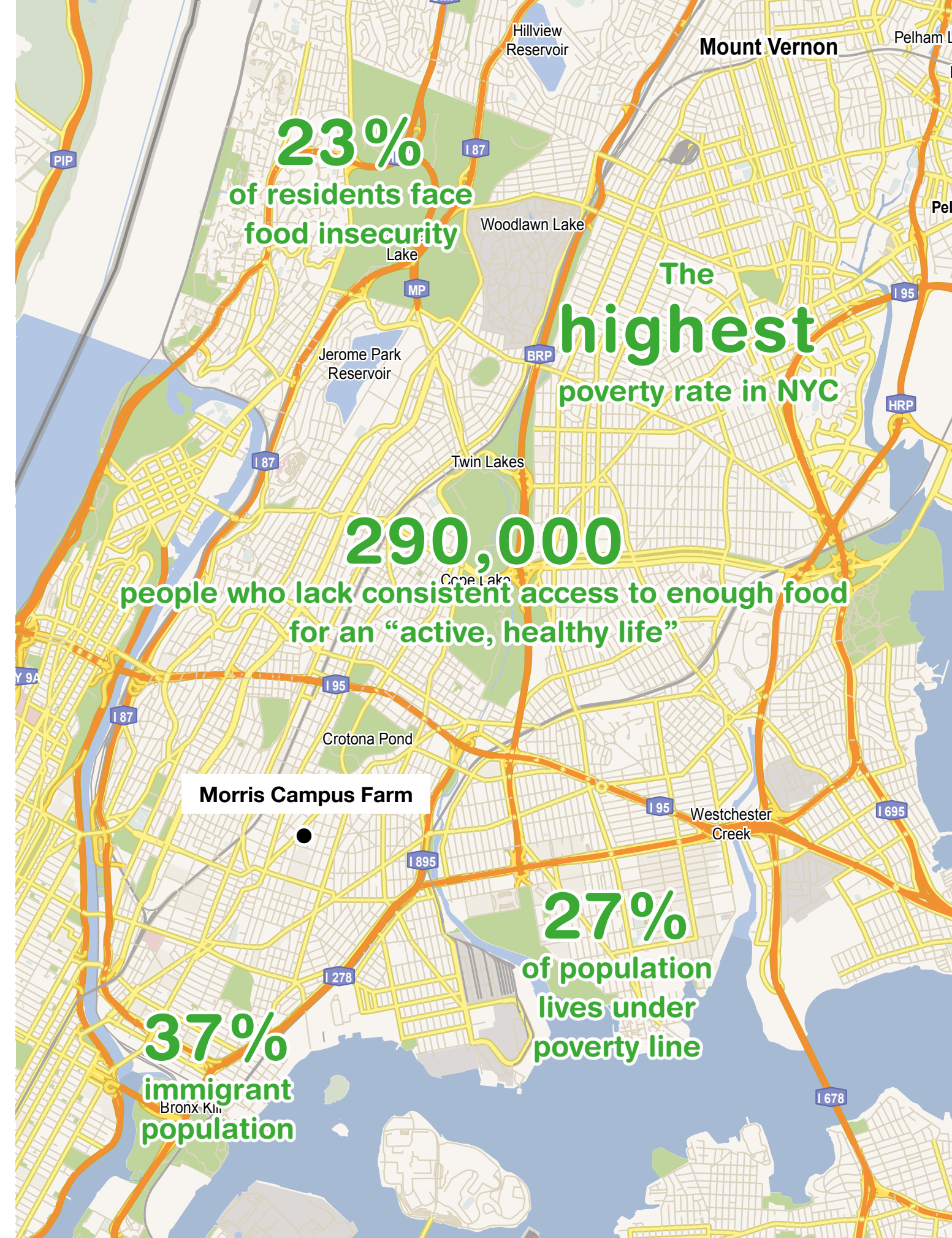
- Kadeesha Williams, Chief Horticulturist, Bronx Green Up initiative

room," the chef replied, without skipping a beat. With the martyred air of teenage resignation, the girl accepts a

cup of soup and takes a tentative sip. "Oh," she exclaims, "I actually like this!" Around her, her friends slowly start to shuffle forward to grab a cup for themselves.

Located in the south-west Bronx, the Morris Campus Educational Farm is part of a compound housing four public high schools. The farm was built in 2017 on what used to be a parking lot. Since then, each summer and fall, small groups of interns are chosen from each of the four schools to tend to the farm.

Last year the farm supplied almost 300 pounds of produce to the cafeteria and another 500 pounds to the community. The farm's bounty ranges from summertime strawberries to serrano peppers that the Small Axe Pepper Company bottles into the Bronx Hot Sauce. The farm also grows tomatoes, eggplant, okra and a plethora of other



crops that provide a steady supply of healthy food options to a part of New York where residents have historically lacked both the means for and access to healthy food.

According to the New York City Hunger Report, the Bronx is New York's "hungeriest borough," with approximately 26.3% of residents facing food insecurity – almost 290,000 people who lack consistent access to enough food for an "active, healthy life," according to the U.S. Department of Agriculture's definition of food insecurity. Twenty-seven

percent of the population lives under the poverty line – the highest poverty rate in New York City. The Morris Campus Education Farm is located in Morrisania, whose poverty rate is even higher than the borough's average at approximately 35%. Many small urban farms like the Morris Campus Education Farm in the Bronx are focused on providing borough residents with better access to healthy food.

Dishing up food security

At the harvest festival, a handful of the campus' 1,600 students drop cloves of garlic into a raised bed, gently smoothing the soil over it with small rakes. By spring, the cloves will have multiplied to produce a fresh harvest of garlic bulbs. A few feet from the garlic beds, another group of students discusses the merits of cover cropping – growing crops, not for their inherent value to humans, but for the nutritional benefits they provide to soil.

"The kids weren't really benefiting from this space being another parking lot," states Aaron Hargrove, the farm's business manager. "With the urban farm, a lot of the produce we grow here, we provide to the cafeterias so there can be healthier options for the kids."

"There's something of a food renaissance happening in the Bronx right now because people need healthier and affordable options," exclaims Hargrove. "Part of the reason fresh produce is so expensive is because it's coming from so many places outside New York City.

If you can grow it here, you don't have to transport it."

The renaissance that Hargrove alludes to has been supported, in part, by the New York Botanical Garden (NYBG). The garden's Bronx Green Up initiative, founded in 1988, has worked with over 75 community gardens, green-ing groups, schools and community organizations. "NYBG is a huge institution and they're right here in the Bronx! How could they not support this movement?" declares Kadeesha Williams, the chief horticulturist at the

Bronx Green Up initiative, who grew up in the Bronx herself.

The initiative provides technical assistance and training, design expertise and plant materials like compost, top soil, shrubs and seeds. The NYBG also connects donors with communities, as was the case with the Morris Campus Educational Farm, which was partly founded with a large donation from an anonymous, one-time donor.

1. Mural titled 'Mother Earth' by Josh Sarantitis and Mikaela Gonzalez. Photo: Carmen Bardeguez-Brown



As incongruous as the Morris Campus Educational Farm may seem against its grey and concrete surroundings in Morrisania, urban farming has been a part of New York's cityscape since the 19th century. Today, the city has 900 food-producing community gardens, 20 community farms and 490 school gardens like the one at Morris Campus Education Farm.

"There is a lot of diversity and innovation when it comes to urban farming. The kinds of farmers can mostly be broken down into people who are farming in community gardens, rooftop farms, and people who are using technology to do indoor farming," states Caitlin Kelmar, the Legislative Director for Councilman Rafael Espinal from the 37th District of New York.

However, it is rare for small-scale, community farms to have access to the kind of advanced technology that drives more upscale urban farming in other

parts of New York City. In the Bronx, the borough's rich urban farming and community gardening tradition is rooted in its diversity.

Almost 37% of Bronx residents are immigrants, many of them bringing a tradition of growing their own food with them when they settle here. "My family came from South Carolina and lived around a lot of farmland. They wanted to bring some of that with them to New York," states Williams. "My grandfather and my father were gardening in the backyard of our building. There was always some aspect of urban agriculture in my life."

According to Williams, many people living in her community were not homeowners and could not grow food in their backyards. Over time, growing food in community gardens became a way for people to preserve the heritage of the homes they had left while forming new ties in the homes they had chosen. "I

know that connecting with the earth is something innate in us. I know this because when we do, we feel grounded," she states.

On the Morris Campus Educational Farm, many students who intern at the farm do so because they grew up in households that cultivated their own food, either out of tradition, necessity or both. Near the beds being planted with garlic, a young girl in a hijab softly tells her classmates how she and her mother would grow okra in their backyard. Except they called it 'lady's finger,' as was common in their native country Bangladesh.

2. Morris Campus Educational Farm Harvest. Photo: Carmen Bardeguez-Brown

3. A selection of Small Axe Peppers hot sauces sourced from garden partners across the US, including Morris Campus Farm. Copyright: Small Axe Peppers LLC

4. Raised beds. Photo: Morris Campus Farm



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Finding the right fix

Despite the growth of urban farming in the Bronx, experts caution that it is far from being a panacea for the borough's food insecurity. "I think we'd be kidding ourselves if we didn't address the socio-economic, systemic problems. It's not just about making more food. It's about who gets access to that food," says Williams.

Some of the systemic problems that Williams and others identify stem from lack of legislative support urban farmers receive. "Community garden farmers are really tied to their neighborhoods, but typically produce food at a much smaller scale. Their biggest challenge tends to be finding a way to legally operate, since there's not a lot of rules on the books, different inspectors may come to different decisions about what is and isn't allowed," writes Kelmar.

Urban farming has been a part of New York's cityscape since the 19th century. Today New York City boasts:

900

food-producing community gardens

20

community farms

490

school gardens

THE BRONX, NEW YORK CITY

Councilman Espinal has said he hopes to change that by creating an Office of Urban Agriculture in New York. “Urban farming isn’t a new concept and is something a lot of New Yorkers have been doing for generations. But nothing in our zoning reflects the need to expand this industry,” Espinal’s Legislative Director Kelmar states. “Right now, all that exists are rules that hurt the farmers, not ones that support them. When it comes to urban agriculture we want to make sure that farmers have a seat at the table, but we also have to make sure there is even a table to have a seat at.”

Espinal has been pushing for legislation that will force the Department of City Planning to amend city-wide zoning codes that restrict how urban farmers can use available land in the city.

Deliana Rosario, 16, is in the 11th grade at the School for Excellence, one of the four schools on the Morris Campus. She has been working on the farm since she was in the ninth grade and has developed an interest in understanding where the food she eats comes from. “After I ate the tomatoes we grew here, I realized that tomatoes are not supposed to have that waxy feeling that the tomatoes from the supermarket generally have.”

Rosario’s story resonated with Williams. “That’s an experience I see with almost every single group I work with. I love that they enjoy things that they all say they hate when they eat it fresh,” she says. “That’s the thing about food, once you have something really good, it is really hard to go back to eating a lower quality version.” ●



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5. Students enjoy the warm weather during the November harvest. Photo: Shruti Manian

6. Garlic bulbs awaiting their return to the dirt. Photo: Shruti Manian



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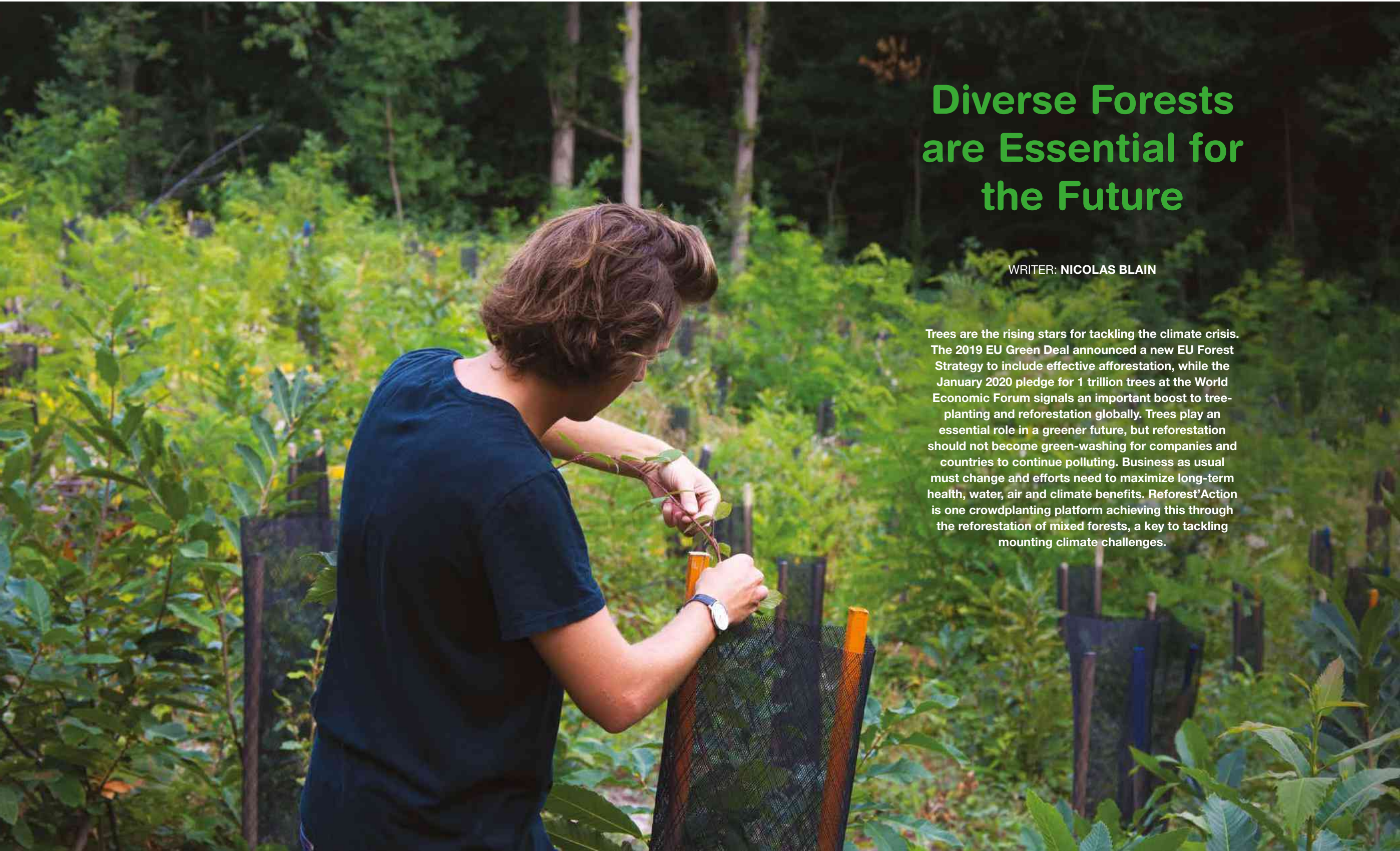
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Diverse Forests are Essential for the Future

WRITER: NICOLAS BLAIN

Trees are the rising stars for tackling the climate crisis. The 2019 EU Green Deal announced a new EU Forest Strategy to include effective afforestation, while the January 2020 pledge for 1 trillion trees at the World Economic Forum signals an important boost to tree-planting and reforestation globally. Trees play an essential role in a greener future, but reforestation should not become green-washing for companies and countries to continue polluting. Business as usual must change and efforts need to maximize long-term health, water, air and climate benefits. Reforest'Action is one crowdplanting platform achieving this through the reforestation of mixed forests, a key to tackling mounting climate challenges.

Due to their natural capacity to absorb CO₂, forests are one of the most sought-after natural solutions to fight against climate change in the eyes of a growing number of leaders and decision-makers. Scientists and international organizations also stress the need for reforestation in addition to forest protection; however, it must be carried out under the right conditions. Replanting diversified forests is essential for two main reasons: Forests composed of several species are more resistant to climate and natural hazards and they provide more ecosystem services than single-species forests. Mixed-species forests are key given the environmental challenges ahead, such as unprecedented droughts, the rising risk of wildfires and the development of insect pests populations.

Forests are our past and future

Trees first appeared on Earth 360 million years ago and have contributed to a wide range of ecosystem functions, providing vital and recreational contributions to people for thousands of years. Trees are significant sources of oxygen and wood, serve as carbon sinks, regulators of the water cycle, and are crucial for innovation in the fields of energy, construction, aviation and health. And forests are a popular destination for outdoor leisure and recreational activities. Today, more than 1.6 billion people directly depend on forests for their livelihoods.

The future of humankind is intimately linked to the future of forests. They represent the world's largest terrestrial storehouses of carbon and provide habitat to more than 80% of terrestrial biodiversity. By protecting and restoring forests, we are addressing two of the greatest challenges ever faced by humanity: climate change and the erosion of biodiversity.



Dire climate forecasts for forests

If current CO₂ emissions continue, we will experience an increase in global temperature by 4°C or even 7°C by 2100, signaling the urgent need to vigorously accelerate reduction efforts. Europe will be directly affected by this rise in temperatures. For instance, France could experience summer heat peaks of more than 50°C by 2100 and some regions could even reach 55°C.

Directly linked to the rise in temperatures, drought is the primary factor affecting tree growth in forest soils. French forests will not be spared by this phenomenon and our forests represent the 4th largest forest area in Europe. Researchers predict an increase in the frequency of heat waves and droughts, as well as the ever-worsening average intensity of soil droughts. In Europe, forest inventories have recorded an increase in tree mortality over the past 15 years, which is thought to be caused by droughts. It is also known that the natural migration of French tree species at the current rate of 50 km per century will become considerably slower than the migration of their potential bioclimatic envelopes, which should move about 500 km northwards. In this context, the rate of extinction of local forest plant species is estimated to reach 30% by 2050 in Europe.

1. Photo: Reforest'Action
2. Oak saplings ready to be planted. Photo: Reforest'Action
3. Young oak. Photo: Reforest'Action
4. A full grown oak tree. Photo: Reforest'Action
5. Volunteer carrying pine and oak saplings in Sainte Apolline Forest, Yvelines, France. Photo: Reforest'Action



The extinction rate of local forest plant species in Europe is estimated to reach 30% by 2050.

Source: Assessing the Effects of Forecasted Climate Change on the Diversity and Distribution of European Higher Plants for 2050 (Bakkenes et al., 2002)

Some scientific researchers are also contemplating a longer drought recovery time for ecosystems and for forest ecosystems. The period of time between two drought episodes could become shorter than the recovery time itself. This would entail an ongoing situation of incomplete recovery of forest ecosystems with an increased risk of reaching a critical point for trees potentially leading to mass forest dieback. California has experienced a historic drought and lost about 102 million trees between 2010 and 2016; in 2016 alone, 62 million trees were lost and overall, approximately 3 million hectares of forest have died out – an area equivalent to Belgium.

Forests more affected by droughts will be more exposed to fires. In 2020, 50% of French forests will be exposed to a high risk of fire. In addition, over this century, storms originating from American tropical cyclones are expected to increase on the western flank of Europe. Storm damage could double in Europe by 2100 as a result of rising productivity in forest management increasing the size of trees and thus their sensitivity to wind.

Overall, it is currently estimated that 20% of European forests will be affected annually by both abiotic (storms, drought, etc.) and biotic (insect pests, pathogenic fungi, etc.) hazards. It is also known that global warming contributes to increasing the population of insect pests and their winter survival. Drought and rising temperatures can weaken trees and enhance their vulnerability to insects. Thus, pathogens causing tree diseases and forest dieback can affect the economic values provided by the forest as they contribute to tree mortality,



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reduced growth or lower wood quality. In parallel, the number of exotic insect species and imported pathogenic fungi is exponentially rising in Europe.

Diverse forests provide more ecosystem services

Consisting of a diverse range of tree species, mixed forests are generally (but not systematically) more resistant than monospecific stands. A study published by Nature in 2018 on 40 forest sites around the world found that forests with various tree hydraulic traits are more resistant to drought. After a cut or a fire, researchers recommend to replant several tree species according to the best possible hydraulic combination. Several studies show that mixed forests are more resistant to storms and reduce the risk of large-scale damage. In essence, the more surviving trees there are, the bigger the potential is for natural regeneration. And natural regeneration is always cheaper than replantation.

In addition to the variety of species, genetic diversity within a single species is recognized by the French Ministry of



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Agriculture and Food and the Institut National de Recherche en Sciences et Technologies pour l'Environnement et l'Agriculture (IRSTEA) as an essential factor in the adaptation of forests to global warming. The two institutions recommend opting for both mixed species and a mixed genetic origin of the seedlings within the selected species.

In the face of insect pest attacks, single-species forests register 30% more damage than forests sheltering mixtures, in particular because of the presence of non-host trees reducing the number of target trees accessible to insects. The variety of species also entails a variety

6. In 2020, 50% of French forests will be exposed to a high risk of fire. Photo: Reforest'Action

7. Storm damage could double in Europe by 2100 as a result of rising productivity in forest management increasing the size of trees and thus their sensitivity to wind. Photo: Reforest'Action

of colors and odors. These visual and olfactory elements slow down the development of insect populations and limit their damage. The different species also harbor more predators capable of regulating insect pests.

Ecosystem services are the benefits supplied to human societies by the complex and rich ecosystem functions. The subject appeared in the 1970s and has seen a growing interest since 2000 due to reference publications such as the Millennium Ecosystem Assessment in 2005 and The Economics of Ecosystems and Biodiversity (TEEB) report published in 2010. Ecosystem services such as bee pollination are provided for free and play a key direct contribution to human well-being and economic development. Forest ecosystem services include environmental services (CO₂ storage, water filtration, soil retention, improved air quality, protection against natural hazards), economic services (timber production, hunting and gathering) and social services (provision of recreational facilities, water filtration, improved public health and well-being).

In 2016, a group of researchers demonstrated that the homogenization of tree species in European forests reduces their capacity to provide ecosystem services, such as wood production or carbon storage. Scientists specify that the use of more tree species in plantation forests can promote their multifunctionality. This correlation between forest diversity and the production of ecosystem services such as wood has been confirmed by an international team of 90 institutions from 44 countries that came together to form the Global Forest Biodiversity Initiative (GFB) in 2016. As forest diversity declines, so does their productivity. For instance, a 10% decrease in tree species within a forest leads to a 2-3% decline in its productivity. A 25% reduction in tree species also weakens the forest's capacity to store carbon by more than 7%.

At the end of 2017, a new pan-European study analyzed 26 ecosystem functions of forest plots spread over 6 countries on the continent. The results show that the provision of services, such as biological tree growth or carbon storage,

is more important in mixed forests with tree species compared to mono-species. Interestingly, the positive correlation between forest diversity and ecosystem functioning is even more robust in regions with lower water availability, such as southern Europe.

Diverse forests are allies for the future of climate and biodiversity, and so are the invaluable ecosystem services they provide to our societies and on which we all intimately depend. Protecting forests and restoring degraded ecosystems by replanting or supporting the regeneration of a variety of tree species: this is the challenge all of us should endorse and support through quality reforestation initiatives placing diversity at the core of their actions. ●

8. Trees and ferns in Fontainebleau Forest, France.
Photo: Reforest'Action

9. A thin mesh with stakes is placed around the young trees to protect them from wind and animals.
Photo: Reforest'Action



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Urban Permaculture in Barcelona: The Nest City Lab

Discover where REVOLVE
has a new office in Barcelona!

WRITER: MICHAEL KARNER

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Permaculture has become global - but what is urban permaculture, and why does it matter? REVOLVE's regional office in Barcelona's Nest City Lab provides insights on what urban permaculture encompasses, and why this holistic phenomenon is important for a sustainable future.

Permaculture is a systems-thinking design methodology for sustainability. While most commonly associated with perennial or “permanent” agriculture, the concept’s scope has steadily expanded since its appearance in the 1970s. According to its initiators Bill Mollison and David Holmgren, permaculture focuses on creating “Consciously designed landscapes which mimic the patterns and relationships found in nature while yielding an abundance of food, fiber and energy for the provision of local needs. People, their buildings and the ways in which they organize themselves are central to permaculture. Thus, the permaculture vision of permanent or sustainable agriculture has evolved to one of permanent or sustainable culture” (Holmgren, 2002). At present, permaculture can simultaneously be viewed as a sustainable design methodology, a worldview informed by ethical principles, and a global movement present in remote areas as well as the world’s largest cities. The knowledge and techniques used in this approach are drawn from both modern technology and indigenous knowledge from around the world. In this sense, permaculture’s value lies in the fact that it ties together these practices into a holistic system for environmental, social and economic sustainability.

By 2050, 68% of the world’s projected 9.8 billion people will live in cities (United Nations, 2018). Understanding the many ways in which cities can become catalysts of sustainability and landscape regeneration in urban and peri-urban



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1, 2, 3. A more subtle service of The Nest is the sense of wellbeing that one can feel when working surrounded by vegetation. Photos: Alicia Bastos

areas is crucial in the context of the upcoming United Nations Decade on Ecosystem Restoration (2021-2030). Somewhat counter-intuitively, cities are ideal locations for permaculture design, experimentation and innovation precisely because they are some of the most complex systems that humanity has ever developed. On the one hand, they concentrate most of the world’s inhabitants and resource consumption and can be seen as the main culprits of environmental degradation, resource over-abstraction and climate change. But according to permaculture’s design principles, the problem is also the solution. So what better place is there to begin saving ourselves (rather than the planet) than in our sprawling urban spaces? Cities also concentrate



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resources, creativity, power and community. They are therefore crucial platforms for sustainability and drivers of change. Their density and complexity are also their strength, since these qualities allow for the creation of new connections between different elements in the urban fabric to increase sustainability, community-building, resilience and resource efficiency.

What is the Nest City Lab?

The Nest City Lab is an “urban laboratory for sustainability”. It is located in the Poble Nou district of Barcelona, which has been undergoing large-scale redevelopment since the 2000s within the framework of the city council’s @22 program. This massive urban renovation aims at transforming the district into a hub for innovation, education and employment in key sectors. Within the context of @22, Apocapoc BCN’s future plans are to initiate the creation of eco-blocks (manzanas verdes) designed along sustainability and circular economy guidelines. These eco-blocks will preserve the industrial heritage of the neighborhood and help residents and businesses and to cluster their activities and innovate in the urban

fabric (with co-living, rooftop gardening and greenhouses, to name but a few examples). It is within this context that Apocapoc BCN, the entity behind the Nest City Lab, decided to create an urban hub for sustainability.

Apocapoc BCN launched its first green shared working space in the medieval Born neighborhood in the center of Barcelona in 2013. Its co-founders decided to scale up their efforts by launching the much larger Nest City Lab in 2017. At present, this laboratory is an apt illustration of how citizen-led permaculture initiatives can have a positive and far-reaching impact on the urban fabric and city dwellers. The Nest’s leitmotiv is experimentation, or how citizens can catalyze bottom-up, systemic change for sustainability and resilient urban communities.

One of The Nest’s primary functions is to serve as a shared working space for around 170 individuals, working for companies or as freelancers. Going beyond the classical definition of a co-working space, The Nest is intended to be a place that encourages switching to sustainable daily habits, engaging in a life-long learning process and finding support in a community of practice. The ultimate goal of the space is to encourage the transition to a new culture focused on pro-active sustainability amongst “The Nesters”.

Green architecture

The building that houses the Nest City Lab is a striking example of green architecture in itself. Previously, this large industrial structure was used for metallurgy and carpentry. In 2017, The Nest team set out to upcycle its infrastructure by striving to attain the stringent certifications of the LEED (Leadership in Energy and Environmental Design) green building certification platinum standard. To meet the LEED criteria, The

4. The large industrial structure of The Nest City Lab was previously used for metallurgy and carpentry. The Nest team strove to recover and upcycle as much as possible of the resources or elements in the building. The large industrial bridge crane was kept and actually used during the construction process. Photo: Alicia Bastos

5. The Nest’s garden purifies gray water from the kitchen, bathroom sinks, showers and urinals using a natural phytodepuration and infiltration system. Photo: Apocapoc BCN

6. The Nest counts different forms of food production: vertical gardening, rooftop gardening, aeroponic gardening and permaculture gardens. Photo: Apocapoc BCN

Water and energy

Nest team sourced most of its building materials within a 800-kilometer radius of Barcelona, using FSC-certified wood and recovered metal that was collected on-site. Whenever a resource or an element in the building could be recovered and upcycled, The Nest team did so, opting for recycled or second-hand furniture and equipment to attain its sustainability objectives and further reinforce its zero waste and circular economy approach. The certification also incorporates the waste recovery and management process during the construction phase, as well as on-site recycling on a day-to-day basis. Going a step further, The Nest team periodically audits its waste bins to assess the levels of recycling that are actually being achieved and provides reusable cutlery and utensils to its members in order to avoid the use of single-use plastics.

The Nest is designed to draw 30% of its water needs from Barcelona’s water supply network. The rest of the resource comes from rainwater harvesting, a well that was drilled on-site, as well as reused wastewater that is purified naturally in The Nest’s gardens using grey water from the building’s kitchens and showers. This water is used in the building’s toilets, as well as for watering the gardens and cleaning. The only water that is reintroduced into the public network is black water from the toilets. While these details may seem secondary, one can only imagine the impact on resource use and environmental quality that this approach would have at the scale of an entire city, generating employment and new sustainability-related knowledge in the process.

The Nest team’s objective was to produce renewable energy on-site. However, this option was not feasible due to the specificities of the building’s glass roof, its orientation, and regulations affecting the neighboring buildings. Instead, The Nest invested in a regional renewable cooperative, SomEnergia, which provides green electricity to the space. Furthermore, all of the space’s devices and light-bulbs were selected for their energy efficiency, while heating and cooling is regulated by a central terminal that prevents over-consumption and encourages Nesters to improve their consumption habits and environmental footprint. The bioclimatic building’s breathable natural materials allows users to experience alternative means of achieving the right thermal comfort thanks to solar protection (shades), cross ventilation in the summer, and



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well insulated spaces and residual heat during the winter. The design also encourages Nesters to learn to live with the building's vegetation, which also has specific needs.

Soil, food and nutrition

The Nest City Lab is also a hub for urban agriculture. It counts different forms of food production: vertical gardening, rooftop gardening, aeroponic gardening and permaculture gardens. The latter are designed to emulate the functioning of ecosystems while avoiding inputs such as fertilizers and pesticides, focusing on the organic production of edible or medicinal varieties as well as plants that are useful in creating soil or as building

materials. These gardens also include an indoor "food forest," symbolically placed in the center of the space, as well as a patio that counts numerous typically Mediterranean species. Food forests are designed along agroecological and agroforestry principles to once again emulate the functioning of forest ecosystems while producing food and materials, improving soil and allowing for the establishment of biodiversity for fauna and flora alike.

In line with its plant-based nutrition philosophy, The Nest also houses the Väcka organic and vegan nutrition project, which includes a cheese factory, as well as Cafeteria Botanica, an in-house vegetarian café. Some of the vegetables and fresh herbs produced at The Nest directly supply Väcka. In turn, all their organic waste (as well as The Nest's) is either composted on-site or transported by bicycle to the nearby Connect Hort permaculture garden and community space. In Connect Hort,

the project Abonokm0 (Compostkm0 in Spanish) transforms this organic waste into compost, which is then reused the area's local gardens. This is but one example of how creating the right connections in dense urban spaces can yield local abundance as well as a host of environmental and economic benefits, from zero-kilometer production and reuse to significant savings in terms of the transport, conditioning, packaging and conservation of perishable goods.

Community and innovation

Permaculture is not only about land, water, energy, waste, green economics and technology. It is also, and perhaps most importantly, about education and culture. Numerous trainings on permaculture have been delivered to old and young in the space. The Nest City Lab also acts as a hub for education, experimentation and innovation, offering

7. The Nest City Lab shared working space in Barcelona. Photo: Apocapoc BCN



entrepreneurs and start-ups the possibility to test and improve their ideas. For instance, The Nest houses Tree Nation, which allows individuals to participate in reforestation projects around the world, the Luffa Shop which provides zero waste options online, Esferica, which uses recovered plastic chips to locally produce high-quality sunglasses, the Green in Blue aquaponics start-up which produces organic vegetables and fish in a closed-loop cycle, Green Living which provides consulting to create efficient and healthy buildings and Mon Petit Pot which offers workshops for DIY organic cosmetics. And of course, Slowup, the architecture firm that co-created the space constantly experiments on site with new systems and materials. Monthly charity actions are also organized at The Nest to help Barcelona's most deprived populations with basic necessities and also stimulate sustainable projects through crowdfunding campaigns.

8,9. The gardens also include an indoor "food forest," symbolically placed in the center of the space, as well as a patio that counts numerous typically Mediterranean species. Photos: Alicia Bastos

Another essential aspect of the space, and indeed of urban sustainability in general, resides in the "invisible structures" and "invisible services" that are provided by nature in the city. Within The Nest itself, this includes the air purification, water filtration, biodiversity and habitat for pollinators provided by the plants and green spaces, which are effectively providing valuable "ecosystem services" to the space. A more subtle service is also the sense of wellbeing that one can feel when working surrounded by vegetation.

The importance of urban permaculture in Mediterranean cities

Numerous other groups and spaces are currently active in Barcelona and the wider region of Catalunya. For instance, Permacultura Barcelona organizes permaculture and sustainability workshops in demonstration spaces and gardens located in Barcelona and Catalunya. Alternative spaces such as the Can Masdeu community have been trail-blazing urban sustainability through

urban agriculture, sustainable design and neighborhood gardening spaces for nearly 20 years.

The same can be said of numerous regions of the Mediterranean, in which widespread permaculture experimentation in a multiplicity of forms is taking place, be it in urban and peri-urban spaces or rural areas. With its benign climate, rich fauna and flora, ancient agricultural traditions and cultural diversity, the Mediterranean has the potential to illustrate what sustainability resembles in a very real sense – in our cities, streets, homes, working places, in our villages and our fields. Sharing and replicating positive examples that instill optimism rather than anxiety is all the more important as the compound effects of climate change, land degradation, water scarcity and pollution become ever more apparent along its shores. As the example of the Nest City Lab illustrates, cities have an essential role to play in ensuring that the future of the region is one of abundance and integration rather than scarcity and fragmentation. ●

Find out more: apocapocbcn.com and [#nestcitylab](https://twitter.com/nestcitylab)



Image: Wirtschaftsförderung / Ben van Skyhawk

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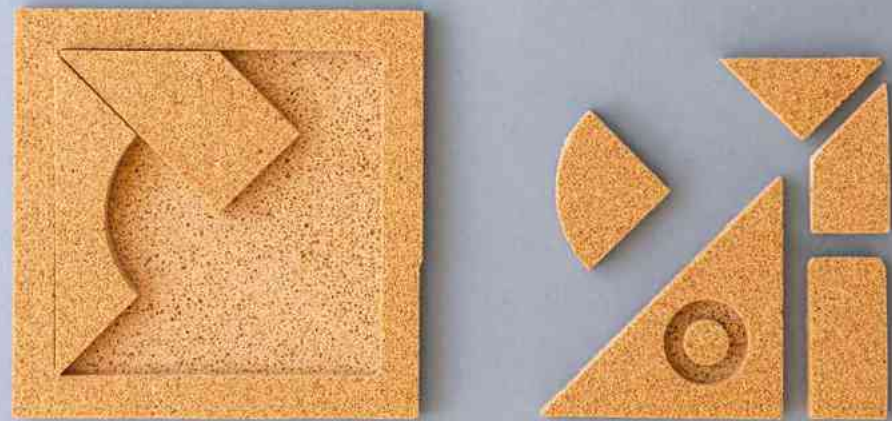
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Transformative Products from Olive Stones

Re Olivar is the circular economy's
new reusable biocomposite



WRITERS: **SILVANA CATAZINE & JOSEÁN VILAR**

Toys that can become bowls, chairs that grow plants, and exhibition stands that shape-shift for each new edition. These are only the first three lines of application for Re Olivar, the new biocomposite based on olive stones. Organic, biodegradable, reusable and highly fashionable, Re Olivar provides new possibilities for the reuse of a product and its life-cycle.

The basic mixture of ground olive stone with other natural ingredients can be formed into a wide variety of textures and appearances, depending on the amount and type of stone material used – granulate, powder or flour. The material can appear wood-like to transparent and is remarkably malleable. The biocomposite is available in different colors thanks to a dying

process using only natural sources such as turmeric, avocado, indigo, and cochineal.

Products made from Re Olivar can be melted and reused again for the same or a different purpose with virtually no loss of material. “The customers can choose between discarding the final, biodegradable products or use their

creativity to manufacture a new one from our material,” explains Silvana Catazine, co-developer of Re Olivar with Joseán Vilar.

In their creative studio, Naifactory in Barcelona, Catazine and Vilar have already set up three lines of Re Olivar products with high customization potential.

Toys with a future

Of products on the market, toys have one of the shortest life spans – 90% of which are made of plastic. As most toys outlast children’s interest in them, they are a large source of plastic pollution. In search of a more sustainable alternative, many parents are turning to natural materials, such as wood.

Living furniture

While researching the suitability of Re Olivar for decorations and small furniture, Catazine and Vilar designed a chair for children. With the vision to increase its sustainability even in its afterlife, they embedded it with

seeds. When the child outgrows the chair, he or she can bury it outdoors and watch a plant sprout out of their former seat.

To incorporate the Sustainable Development Goals within their project’s approach, they are currently looking for foundations or enterprises with social inclusion programs as manufacturing partners.



The granulate version of Re Olivar provides a similar look, texture and function – while being much lighter. And better yet, when tired of playing with the toy, the child can find another source of joy by transforming it into a new object.

The first model being developed is a 3D puzzle that will include colored inserts made out of another version of the biocomposite material. Developed for a Barcelona-based toy and decor company, it will hit stores before the summer.

Not-so ephemeral architecture

Every year 4.4 million companies display their products at fairs and trade shows.

The search for stands that meet sustainable criteria has become an increasing challenge, with wood and plastic panels still leading as the materials most often used. Re Olivar panels allow for a great versatility of shapes, textures and colors and can be reused time and again and their light weight makes them more transport-friendly than wood.

The Re Olivar panels will début on 14 May at the 21 Feira Ópera in São Paulo where they will reinforce the message for the summer edition of the international trade show: “There is no B planet.”

1. Puzzle made from ground olive stones.
Photo: Mike Water

2. The biocomposite can be used for a variety of applications and add an element of circularity to any interior. Photo: Mike Water

Work for progress

Focused on design for circular economy, the founders of Naifactory define Re Olivar as a project with several ongoing research fields. In their quest to foster locally-based products, they turned to olives as their proof-of-concept raw material because Spain leads the world production with a 21% share. The stones –which make up 15% of an olive weight– have been traditionally neglected as waste, and only recently found their way into the cosmetic and mainly the biofuel industries. Re Olivar bioplastics unfold a whole new realm of applications, which can be replicated with different local by-products in other parts of the world. That’s why the designers are already working with rice in the Valencia region or cassava peels in Brazil, while also testing new organic binders to add different qualities to the basic mixtures. The no-waste, circular journey has just begun. ●



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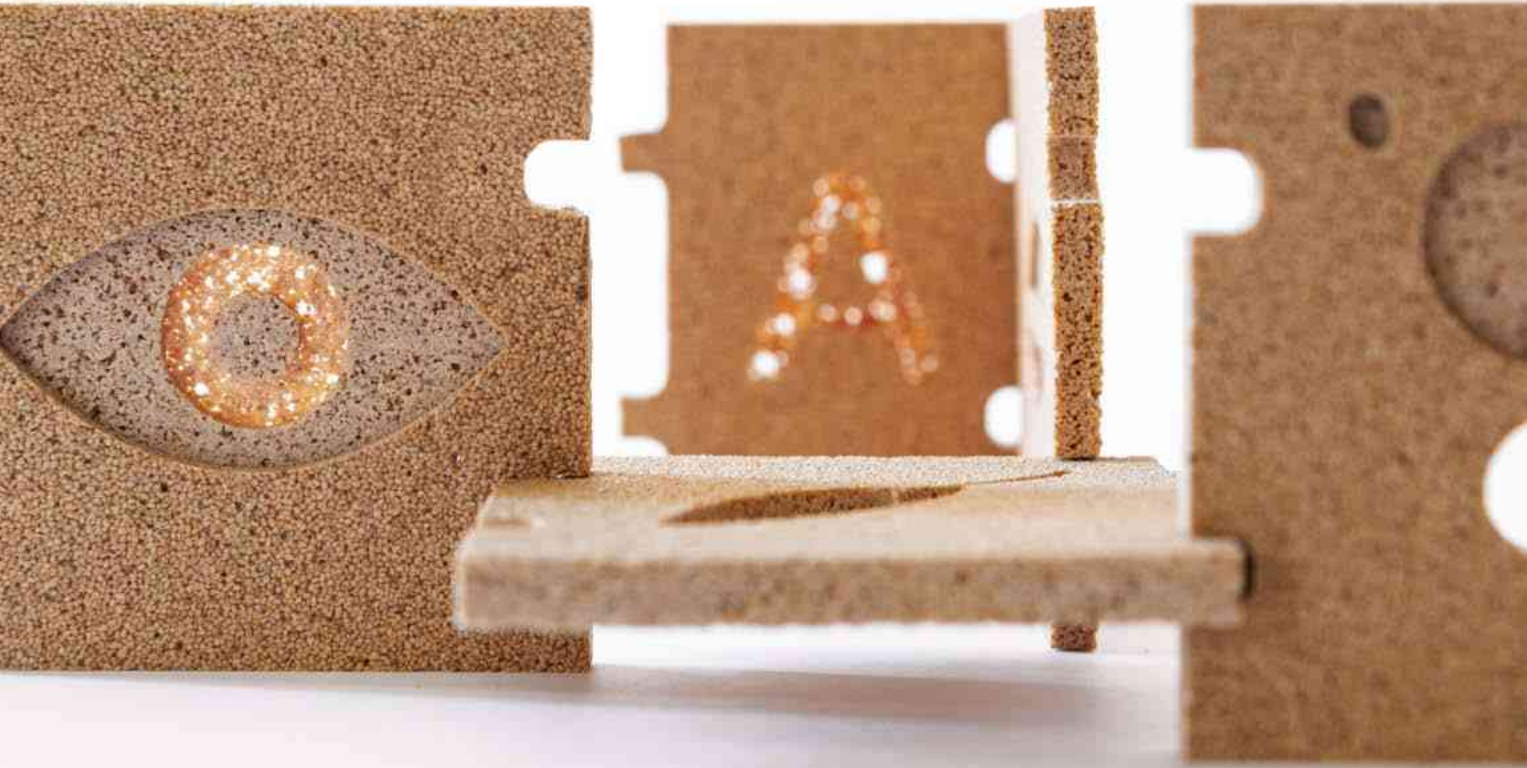
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3,4. The puzzle prototype made from ground olive stones. Photo: Mike Water
5,6,7,8. The customization potential of the biocomposite means the sky is the limit. Photo: Mike Water

4



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