REVOLVE

QUARTERLY INSIGHTS INTO A CHANGING WORLD

N°39 | Spring 2021



Ecosystem Restoration

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We asked – you answered!

At REVOLVE, the month of March is all about ecosystems. In keeping with our commitment to the **UN Decade on Ecosystem Restoration**, this issue is dedicated to ecosystem restoration in partnership with **Ecosystem Restoration Camps (ERC).**

We collected stunning images from ERC camps around the world, and invited our readers to vote for their favorite for the cover of this issue!

The pictures that were not selected are featured in the VIEWS photo essay.

Thank you for choosing!



Watch this space for more on sustainability:

revolve.media



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Ecosystems

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Founder and Director, Kubernein Initiative and Transboundary Water Security and Diplomacy Specialist.

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revolve.media/repurposing | revolve.media/reforest

In 2020, REVOLVE offset its CO_2 emissions via 8 Verra Certified Carbon credits from a forest conservation project in Brazil, and by planting 56 trees in the Stoumont Project in Belgium.

Cover image: Ecosystem Restoration Camp Mainsprings, Tanzania. Camp Mainsprings' Agricultural Manager, Edward, brings a couple extra pieces of papaya from its diverse food forest, adding to the nutritious and delicious options for the nearly 1,000 plates of food served to our students and staff daily. The mix of perennial and annual crops provide over 50,000 kilograms of fresh produce for the community every year- direct from the Permaculture farm! Photo: ERC

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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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It’s All About Ecosystem Restoration



This year marks the beginning of the new UN Decade on Ecosystem Restoration (2021-2030), which follows on footsteps and efforts of the UN Decade on Biodiversity (2011-2020). Having just begun the year, everyone is of course very excited about this theme and the prospects of contributing to the restoration of our ecosystems. Easier said than done.

At REVOLVE, we are delving into finding out what ecosystems actually are, how they are defined and organized. We found that they are incredibly diverse, highly complex, and that the UN classifies them in 8 types including:

- Farmlands
- Forests
- Freshwaters
- Grasslands, Shrublands and Savannahs
- Mountains
- Oceans and coasts
- Peatlands
- Urban areas

The inclusion of urban areas on a short list of ecosystem restoration areas may seem strange, but urban areas have a considerable impact on their surrounding environments, and to climate change and global deforestation through their consumption patterns. Cities are even part of novel urban ecosystems, with the IUCN Global Ecosystem Typology 2.0, including classifications for “urban and industrial areas” and even “water pipes and subterranean canals”.

As part of Cities4Forests, a global network of nearly 70 cities that seeks to raise awareness about the city-forest nexus, we are seeing growing interest in particular from India and China, and Asia at large, in joining our network, not entirely surprising given the colossal challenge of coupling economic growth with sustainable development in the context of climate change.

The sheer economies of scale in India and China alone multiply the ripple effect of tree-planting for example where both countries planted millions of trees in a matter of days. In 2017, 1.5 million volunteers planted 66 million trees in central India, breaking world records; and in China, Alipay’s Ant Forest App reaches over 500 million people that play to win green points to build virtual forests that are converted with enough points into real trees by the mega e-commerce company planted to combat desertification. 500 million people is a lot: that’s almost two Europes.

But ecosystem restoration is not just about tree-planting – that’s probably the lowest-hanging fruit. Ecosystem restoration is the “process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed” (SER, 2004). But where to start?

To help answer this question, the IUCN has developed two tools, the Global Ecosystem Typology, a hierarchical classification system that provides a framework for comparing similar functional traits, drivers, threats, and indicators, and the Red List of Ecosystems Categories and Criteria (IUCN RLE), a global standard for assessing risk of ecosystem collapse. When used together they allow for comparison of risk of collapse of across various ecosystem types, and thus allow us to better direct restoration efforts.

In the lead-up to the UN International Day of Forests (21 March), REVOLVE is hosting the Cities4Forests Day on 18 March with an International Press Conference for journalists to learn more about the value of forests and an Expert Panel with the UN Environment Programme, the IUCN Red List of Ecosystems and the Ecosystem Restoration Camps (ERC).

This issue of REVOLVE reflects that close cooperation with ERC: the cover is the result of a contest amongst the camps for the image with the most likes and the VIEWS includes the other camps that submitted images of their wonderful work to restore nature. REVOLVE is grateful to their participation and proud to be partnering with these reputed organizations.

We hope you enjoy this issue and look forward to your feedback!

Join the conversation on social and stay tuned for more livestreaming this spring as we go deeper into this new decade on ecosystem restoration.

AMBIKA VISHWANATH, ASYA AL MARHUBI, AND STUART REIGELUTH

Sustainable Agriculture: It's Time to Get Informed

WRITER **ADAM EUNSON**

In our attempts to make agriculture and the food choices we make more sustainable – information is key. The COVID-19 pandemic has been an unfortunate distraction from what remains one of the most pressing challenges humanity faces, providing food for everyone, and without destroying the planet in doing so.

As with the response to COVID-19, the sharing of knowledge lies at the heart of our attempts to make our food systems more sustainable, and with it our individual food practices.

Now it's time for us all to get informed.



1. Beth Wanjero talks to an adviser from the sustainable development initiative about points raised in the training manual relating to her farm near Gilgil, Kenya. The Self Help Development initiative teaches farmers how to make their land more productive and provides sustainable solutions to combat environmental problems. Photo: Kate Holt / AusAID

1

Providing farmers with information, tools, and resources – such as GODAN (Global Open Data for Agriculture and Nutrition) and the Open Agriculture Journal – is the first step towards developing more sustainable agricultural practices. This could branch out to providing information to retailers, manufacturers, and distributors – supporting the design of more sustainable supply chains and providing consumers with transparent information about the food we eat.

Implementing information distribution on such a scale had seemingly appeared impossible. Yet this past year has clearly shown otherwise, with the COVID-19 pandemic prompting a new and more urgent interest in sharing and mining existing data, and in pooling resources to develop powerful open access information systems. In knowing what is achievable, how can we transfer this enthusiasm for data to ensure it becomes a reality for sustainable agriculture?

Driving change through information

Numerous areas of the food industry are already driving change through information. Traceability solutions like Laava in Australia is allowing consumers and businesses to authenticate produce, as well as transparency software such as IBM Food Trust, which uses blockchain technology to improve transparency, standardization and efficiency throughout the food supply chain.

These solutions might be available, but only for those who can afford them. For smaller farmers in Asia, or rural communities in sub-Saharan Africa or Europe, funding a multi-thousand-dollar traceability system is simply not a viable option.

This technology needs to be shared. Bill Gates calls it 'economic generosity' – support of the developing world by the more advanced economic powers. Rather than thinking about how we grow our food, or who grows it where, we must focus on the infrastructure and community development behind the supply.

In Africa, the African Center for Economic Transformation is promoting a focus on the chain of process: land tenure, farming technology, markets and pricing. They are putting technology at the core of agribusiness, developing mobile apps as a means to reach farmers and to track data on land conditions.

The distribution challenge

Countless technological and traditional farming studies that investigate sustainable development have been conducted across many different fields within agriculture. But distributing this information to 570 million global farms is no easy feat. In developing collaborative projects like the research and policy influence of the Ceres2030 project, we can help draw a focus towards the support of small-scale agricultural infrastructure development, so that farmers can gain access to the vital tools and techniques they require to generate economically viable, sustainable farming systems.





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Ceres2030 is a partnership of academia, civil society, and economists promoting a common vision: a world without hunger, where small producers increase their agricultural incomes and productivity, all while promoting sustainable food systems.

Once farmers have access to these resources they can refocus on their lands and communities, drive regenerative agriculture, and re-engage with the public – offering open access to information and traceability surrounding the food they produce.

2. Beth Wanjero is using a drip watering kit on her farm near Gilgil, Kenya. The watering drip was supplied by the Self Help Development initiative.
Photo: Kate Holt / AusAID

3. Boxes of fresh vegeables that have been grown in the Abalama Bezehkaya garden await distribution in Guguletu, Cape Town, South Africa. The Abalami Bezehkaya project teaches people better farming techniques and sells fresh produce weekly to generate incomes for the farmers involved.
Photo: Kate Holt / AusAID

4. British dairy and graze systems are among the most efficient in the world. Scotland, UK. Photo: Gary Ellis

A multi-dimensional approach

While the sharing of information is one of the key factors to facilitate change, a multi-dimensional approach is required to bring about sustainable agricultural systems that keep up with the ever-increasing challenge of feeding the world.

Today, the concentration of human populations in relation to agricultural outputs is another driving factor in finding more efficient solutions.

Soy farming, as an example solution, would convert millions of hectares of land to mass produce bean protein. However, this would lead to the gargantuan task of land-use change, processing, waste disposal, and global transportation of a mono-focused food supply, that is susceptible to disaster. Envision a world in 20 years where 70% of global protein is derived from soy and we are presented with a crop disease that devastates 80% of all soy crops – it would be a crisis that the world could not respond to.

We can also observe the practicalities of growing such crops in say sub-Saharan Africa, or highland grazing pastures, it is simply impossible. The best use of land in certain environments favor animal-based agriculture. Take British dairy and graze systems, among the most efficient in the world. Emission reductions of over 25% in the past 30 years, with productivity over 40% higher than global counterparts. Sharing such techniques and systems and applying them to similar scenarios around the world can offer the potential to produce more than required – whilst reducing the impact – as well as improving natural carbon sinks across high-sequestering grasslands.

So what options can we depend upon to sustain this overwhelming boom in urban centers? In this case the technology already exists and is gaining momentum.

For example, vertical farming, using hydroponic, geoponic, substrate, and aeroponic systems, is creating a phenomenal transformation that offers year-round, low impact food production that can be grown in urban environments.

This provides an ease of access to nutritional foodstuffs in densely populated areas. Yet still these kinds of technology are not being implemented on a large scale. Why? The bottom line is, agriculture, along with every other industry, is profit-driven, and economic powers do not like change, because change costs money.

Vertical farming is food production technique allowing for increased food production in a limited area. Instead of farming vegetables and other foods on a single level, such as in a field or a greenhouse, this method produces foods in vertically stacked layers, often in skyscrapers, shipping containers or repurposed warehouses.

This modern idea uses indoor farming techniques. The control of temperature, light, humidity, and gases make producing both food and medicine indoors possible. In many ways, vertical farming is similar to greenhouses where natural sunlight is enhanced by artificial means.

Much like in the 1990s when the energy industry refused to accept renewables as the future, we are witnessing the same now in big agriculture. Giants of the industry hesitating to deviate from highly invested industrial monocropping systems, in favor of developing sustainable alternatives, because the infrastructure transformation will incur huge immediate expenditure. Jumping forward 30 years, we are seeing increasing public pressure on the energy industry to move towards clean energy. We need to see such change in agriculture also.

5. Lactuca sativa (Lettuce, prickly lettuce) in Hydroponics greenhouse. Photo: Forest and Kim Starr



Rather than thinking about how we grow our food, or who grows it where, we must focus on the infrastructure and community development behind the supply.

Individual responsibility

When it comes to bringing about significant change, we usually turn to our governments, corporations, and policy makers, who together control much of the industry's output. They are certainly important instigators, but not the key players. It is primarily down to public interest, awareness, and demand, that change will be made.

We, the public, are the driving force behind our sustainable future. As consumers, we choose what we eat, we support the producers and manufacturers of the products we buy. If we continue to demand non-sustainable, factory-focused produce, we will continue to receive it. It is that simple. Our actions define the demand behind the supply.

If people do not know, then people cannot act. Understanding and accepting our impact, our options, and the changes that need to be made is where our solutions can develop.

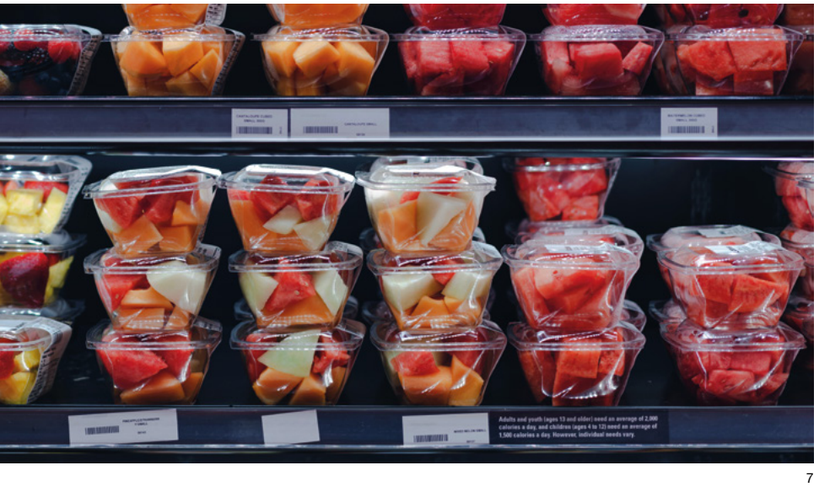
In focusing our food purchases towards more sustainably produced, local products, we develop an increasing demand for these food items. Where there is demand, businesses will supply. It is easy to forget that everything we eat has been grown, processed, packaged, and delivered. We rarely stop to think about that process, growing accustomed to this ease-of-access, somewhat ignorant of the impact our daily consumption carries. As a result, our current food choices continue to drive many of the environmental, nutritional, and socio-economic challenges we face.

The good news is, we are also the ones with the power to reverse this. By demanding transparency, observing traceability, holding non-sustainable companies accountable by targeting our food purchases towards more sustainable businesses – these will be the defining factors in successfully bringing about change.

We, the public, are the driving force behind our sustainable future.



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This past year has presented countless challenges. Our entire lives have been altered to accommodate change in a way we previously could not have even comprehended. This demonstration of public acceptance towards necessary solutions, in such immediate circumstances, is evidence that we can work together, share our knowledge and information, and make the necessary sacrifices to achieve radical change. ●

6. Fruit stand in a farmers' market. Photo: Shelley Pauls

7. Assorted fruit pieces in plastic containers on a supermarket shelve. Photo: White Rainforest

18 March 2021

Cities4Forests Day

On the value of forests and ecosystem restoration.

– Online –



PRESS CONFERENCE
10am (CET)

Why we need to restore forests, and how we import deforestation

Dr. Elvis Paul N. Tangem, Africa Union
Tadashi Matsumoto, OECD
Nicole Polsterer, FERN

EXPERT PANEL
2pm (CET)

What is ecosystem restoration all about?

Tim Christophersen, UNEP
Marcos Valderrabano, IUCN
Ashleigh Brown, Ecosystem Restoration Camps

www.cities4forests.com

Organized by: Cities4Forests REVOLVE

In partnership with: 21 March International Day of Forests · ecosystem restoration camps · United Nations Decade on Ecosystem Restoration 2021-2030 · African Union



Bringing Back Nature for People and Planet

WRITERS: **EDEL SHANAHAN AND SABIEN LEEMANS**

For centuries humans have plundered the natural world to cash in on short-term benefits, significantly altering three-quarters of the Earth's land and two-thirds of the ocean. Since 1970 there has been, on average, a decline of 68% in wildlife populations and this catastrophic loss of biodiversity is exacerbating already dangerous levels of climate change. From exchanging natural forests for agriculture monocultures, to choking rivers with hydropower dams and scraping the seabed to extract fish from the depths of our ocean, nature has suffered immensely, and Europe is no exception.

1

The outbreak of COVID-19 has shone a spotlight on the toxic relationship between people and nature. As humans destroy and modify natural ecosystems, the likelihood of outbreaks of zoonotic diseases – those which jump from animals to humans – rises. And it is not just about physical health either. Our general well-being and the health of our planet are inextricably linked. Already now, the degradation of our natural world due to human activities is having a negative impact on the well-being of at least 3.2 billion people.

The facts are truly harrowing, but thankfully, solutions are available and one fundamental antidote is nature restoration.

Nature-based solutions are actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits - International Union for Conservation of Nature

By protecting and restoring nature and well-functioning ecosystems we can tackle the twin crises of biodiversity loss and climate change, help to prevent the future emergence and spread of diseases and at the same time reinvigorate economies and societies. Large-scale nature restoration is an investment that yields a range of benefits, such as flood protection, water retention and prevention of wildfires. Nature-based solutions, such as the restoration of natural forests and rewetting peatlands, could provide more than one third of the climate change mitigation efforts that are needed before 2030 – although rapid greenhouse gas emissions reduction remains essential. On average, the benefits of restoration are ten times higher than the costs.

An EU law for nature restoration

As part of the European Green Deal and the EU 2030 Biodiversity Strategy, the European Commission will propose legally binding EU nature restoration targets in 2021 to restore biodiversity and degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. WWF welcomes the proposal as a key tool to contribute to halting and restoring biodiversity loss and for climate change mitigation and adaptation, but the devil will be in the detail.

The EU must restore:

- 15% land and sea
- 650,000 km^2 of land
- 1,000,000 km^2 of sea area*
- At least 25,000 km of free flowing rivers

*sea area to be adapted to EU 27 EEZ

With only 10 years left to avert dangerous levels of climate change and biodiversity loss, time is of the essence. WWF is calling on the European Commission to set a target of 15% of land and sea to be restored by 2030 both at the EU and the Member State level. The targets must also be rapidly implemented, have immediate impact on the ground, result in permanent change aiming to restore high quality and resilient nature and bring about a significant improvement compared to the starting condition of the ecosystem. Nature-based solutions and contribution to climate change mitigation and adaptation must also be at the center of the new law.

Equally as important is the full involvement of local communities. WWF firmly believes including communities and local stakeholders in nature restoration projects will be key to success. From the forests of Greece to the mires (a type of peatland) of Estonia, our latest publication *Nature Restoration: Helping People, Biodiversity, and Climate*, showcases the range of benefits that people, biodiversity and climate have garnered from nature restoration. Below a few case studies are outlined, but there are many more to discover from all across Europe.



A community calls for restoration, Parnitha, Greece

Mount Parnitha, which is located 30 km north of Athens, Greece, is a forested mountain range seen by citizens as a symbol for the capital. The forest, part of a National Park and the EU's Natura 2000 network, is home to the Greek fir tree (Abies cephalonica) and to several mammals, birds, plants and herbs species, including protected animals like wolves and red deer, and rare local flowers such as the bellflower *(Campanula celsii)*.

In 2007, the forest was decimated by megafires with 4,900 hectares of Mount Parnitha burned, destroying 62% of the Greek fir trees. Fortunately, Greek forest law obliges the Forest Department to survey an area after a fire and declare it an area for restoration. In reality, restoration work is not always carried out due to a lack of political will or budget constraints.

The local community acted fast and called on its government to carry out the restoration work. Within ten days, a huge protest was organized via social media. Thousands of people wearing black protested in front of the Greek Parliament, calling on politicians to act.

In 2008, the restoration of the Parnitha forest began. WWF Greece, the Forest Department and the Management Authority of the National Forest Park of Parnitha trained nearly 2,500 volunteers, who assisted with the forest restoration. The Forest Department also contracted expert forestry companies to restore the burnt area.

Fast forward 13 years and a mix of natural and active restoration has brought life back to Mount Parnitha. 1,374 hectares were restored naturally by banning grazing, hunting and logging. In the actively restored area, 193,000 black pines, 800 downy oaks and 209,778 Greek fir trees have been planted and more trees are still growing in the Parnitha forest nursery due to be planted in the coming years. In addition, 1,913km of anti-erosion works have already been completed since the first year of restoration.

The Parnitha forest restoration project has been a success, largely spurred on by community engagement, political pressure and the legal obligation of post-fire restoration in Greece.

"With the excellent cooperation of the competent services and the support of all stakeholders, we expect the maximum result, which is the gradual afforestation of Parnitha and its restoration to its original state."

Dr. Georgios Karetsos, The President of the Administrative Board of the Management Authority of the National Forest Park of Parnitha.

1. The forest of Mount Parnitha destroyed by forest fires. Photo: WWF Greece/Andrea Bonetti

2. Team of reforestation volunteers with newly planted saplings. Photo: WWF Greece/Andrea Bonetti

2



Restoring wetlands for biodiversity and climate

Acting as major carbon sinks, the mires of Estonia provide climate change mitigation and boost biodiversity by creating habitats for important wetlands species such as the western capercaillie (*Tetrao urogallus*), the moor frog (*Rana arvalis*) and dragonflies (*Leucorrhinia*). Mires also contribute to water retention and regulate the water balance, which directly impacts the surrounding land and protects local communities and other habitats further downstream. Despite the clear benefits for biodiversity, climate and people alike, mires are becoming rare and degraded across the EU. In Estonia, areas have been severely damaged by drainage for agriculture, forestry and peat extraction, and as a result of lowering water levels, trees and shrubs expanded, causing the typical Estonian fen mosses to disappear.

In 2015, the LIFE Mires Estonia project coordinated by the Estonian Fund for Nature turned the fate of these degraded mires around. The project aimed to restore degraded mires to a favorable conservation status and to increase biodiversity by improving the living conditions of several wetland birds, frogs and butterflies. To allow the area to naturally re-wet, around 300 km of drainage ditches were closed and outflows stopped.

The benefits of mire restoration for climate and biodiversity are still being quantified. However, an analysis of a peat sample area that was restored showed that, in the 30 years since peat extraction ended, the drainage of peat in the area has led to the approximately 1,100 tons of carbon being emitted, and the amount of peat that has been degraded is almost 3,600 tons. The re-sequestration of the same amount of carbon back into a wetland of similar area would take approximately 300 years. Additional analysis is required in regard to whether the carbon sequestration function recovers and at which rate but various studies have indicated that carbon loss can decrease by 50% in less than ten years in recovered or restored areas compared to the situation prior to intervention. In addition, water retention will be improved which benefits the local communities downstream.

The restoration of the Estonian mires is a perfect example of how bringing nature back will contribute to solving both the biodiversity and climate crises.



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3, 4. Closing drainage ditches (3) to allow for natural re-wetting (4). Photo: Marko Kohv



5

5. Mediterranean coral reef habitat.
Photo: J.G. Jo Harmelin / Côte Bleue Marine Park / WWF

37 years of successful cooperation with local fishers

The Côte Bleue marine park is located close to Marseille in France and is part of the Natura 2000 network. It was created in 1983 to enable the sustainable development of small scale fishing activities, to protect the environment, for scientific research and to raise public awareness about environmental issues. The coastal zone managed by the park is made up of extremely rich and diverse ecosystems, including virtually all the different Mediterranean species and habitats.

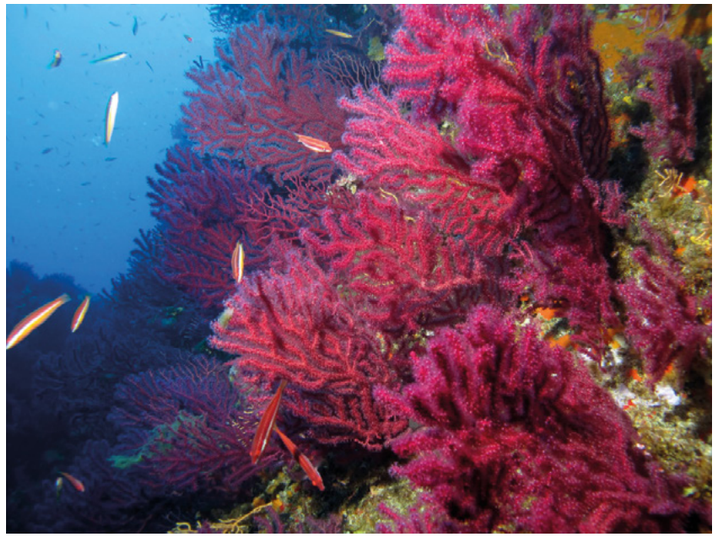
The park aims to protect specific habitats and species, including Mediterranean coral reef habitats, fish such as the dusky grouper and *Posidonia* seagrass meadows. Seagrass meadows are highly biodiverse ecosystems that host 25% of all Mediterranean species. The meadows also protect the coast and therefore local communities, reduce erosion and account for more than 10% of the total amount of ocean carbon storage. Their ability to rapidly store organic carbon into sediments, where it remains 'locked' for long periods of time, is essential in mitigating climate change.

The Côte Bleue park contains two strictly protected areas: Carry-le-Rouet and Cap Couronne, where all kinds of fishing, dredging, anchoring and scuba diving are forbidden. In the rest of the park, all activities, including recreational sports such as sailing and sea kayaking, are permitted. As part of the restoration work, between 1983 and 2004 the park installed 4,884 m^3 of two types of artificial reefs: production reefs and protection reefs. The production reefs were submerged on seabeds devoid of natural habitats to attract, shelter and support flora and fauna. The protection reefs were deployed to act as a barrier against illegal trawling and created

17.5 km of physical barriers. These reefs protect the most fragile elements of the ecosystems.

Crucially, the active involvement of stakeholders in the Côte Bleue project was a key component of the marine park's success story. The involvement of fishers in management and monitoring has proven effective in ensuring sustainable artisanal fishing activities. Several studies have shown the tangible results of this co-management, with the 'reserve effect' (i.e. the increase in fish size, density, biomass as well as species richness) being demonstrated by the return of the dusky grouper as well as the brown meagre fish in no-take areas. The fishing yield has also increased sevenfold since the creation of the no-take reserve of Couronne. As a result, fishers have adopted a more positive view of management measures in the area, as these species also leave the no-take areas and become available to the fishing community. The wider community has also benefited from educational discovery courses, which are organised to explore the marine area and local fishery.

Overall, the Côte Bleue marine park has increased the number of local species and the quantity and size of fish. The park demonstrates how Marine Protected Areas can deliver good ocean governance and benefit local communities and economies.



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The opportunity ahead for people and planet

Across Europe, nature restoration has brought a multitude of benefits for local communities, biodiversity and climate. In the midst of the biodiversity and climate crises, immediate large-scale restoration will be a fundamental tool in tackling both emergencies, bringing added socio-economic benefits.

The European Commission now has the opportunity to kick-start restorative actions by proposing a strong nature restoration law, including ambitious and legally binding targets both at the EU and Member State level. It must also be a key part of Europe's recovery from the COVID-19 pandemic to increase the resilience of our societies, economies, and to prevent the future emergence of zoonotic diseases.

WWF therefore calls on the European Commission to urgently propose a strong and ambitious nature restoration law with a target of 15% of land and sea and for Member States to adopt and implement this as a priority.

"As a scientist with a lot of field experience, I am convinced that for the marine environment, the best restoration measure is to protect the area from harmful activities and then mother nature can recreate biodiversity and restore herself."

Eric Charbonnel, Marine Biologist and Scientific Supervisor, Côte Bleue Marine Park.

6. Paramuricea clavata, the violescent sea-whip, is a species of colonial soft coral native to the coasts of Spain and Portugal in the eastern Atlantic Ocean, and to the western Mediterranean Sea. It is considered to be an ecosystem engineer, as its presence alters the flow of water, changes sedimentation rates, and alters the distribution of nutrients, thus affecting many organisms in its vicinity. Photo: Sandrine Ruitton / Côte Bleue Marine Park / WWF

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AGROMIX: Transforming Landscapes

WRITER: **LARA BARANGE**



International climate change action is increasing, but policy-makers have yet to address a core challenge: land use. Agriculture is a leading cause of greenhouse gas emissions, and with increasing food insecurity and a rapidly growing global population, our response to these challenges must begin in the field.

1

This is the inspiration behind the AGROMIX project - Agroforestry (AGRO-) and mixed farming (-MIX) – which has the ambition of 'transforming landscapes' by delivering new research on how these land use systems work, designing models for farmers to implement these practices, and offering policy recommendations for decision makers to support these practices. How will this four-year pan-European project achieve its ambitious goals, whilst using socially-innovative and high-tech participatory approaches?

Our common challenges:

According to the Intergovernmental Panel on Climate Change (IPCC, 2020), agriculture is responsible for roughly 23% of global greenhouse gas emissions, accounts for 70% of human water use, and occupies 40% of European land surface alone. It is increasingly clear that to limit global temperature rise to 1.5°C above pre-industrial levels – the objective of the 2015 Paris Agreement – a transformation of current land management practices is needed.

Starting in 1950, the so-called 'Green Revolution' introduced modern machinery, chemical fertilizers, and monoculture systems into agricultural production. This brought significant benefits in the short term, reducing global hunger rates from an estimated 50% in 1945 to 11% in 2018. However, this industrialization is taking its toll on the natural environment: chemical fertilizers are reducing soil fertility, land clearing is damaging biodiversity, and monoculture systems are leaving many farmers dependent on the success of a single crop.

Furthermore, after decades of unprecedented progress in reducing hunger, since 2015 food insecurity has begun to rise once again, leading to the Food and Agriculture Organization of the United Nations (FAO)'s staggering prediction that to fulfil the demands of a growing population, by 2050 food production must increase by 60% from 2007 levels. Complicating challenges further, in 2020 the IPCC concluded that climate change itself is reducing agricultural yield. In short: our current food system is driving climate change, which in turn damages food production.

We are presented with the seemingly impossible: significantly reduce greenhouse gas emissions and the impacts of climate change, while simultaneously increasing the quantity of food produced. It is no wonder that in its 2019 review of the effects of climate change on agriculture, the FAO states that "[facing this challenge requires] a significant transformation of agriculture and food systems, with concerted action and coordinated involvement of all stakeholders on a long-term perspective."

How is the world responding?

Despite growing evidence of the agriculture-climate change nexus, for years agriculture has been sidelined in the international climate change negotiations, and even the landmark 2015 Paris Agreement gives minimal attention to land use. However, in the past two years EU leaders have begun to recognize the potential of regenerative land use practices to support their ambitious climate change targets, making way for farmers and researchers to explore the potential of these systems to address the challenges we face.

Specifically, the EU Green Deal – with the ambitious target of making Europe the first climate-neutral continent by 2050 – advocates for regenerative farming in its Farm to Fork Strategy. The Strategy assures that new 'eco-schemes' will offer a major stream of funding to boost sustainable practices, such as precision agriculture, agroecology (including organic farming), carbon farming and agroforestry. Likewise, the 2020 reform of the EU's flagship Common Agriculture Policy (CAP) – see REVOLVE's 2020 feature on regenerative agriculture in the CAP by AGROMIX Communications Manager Josep Crous Duran – encourages the implementation of "sustainable practices, such as precision agriculture, organic farming, agroecology, agroforestry and stricter animal welfare standards." Does this hail a new era, where intergovernmental institutions invest in a meaningful transition towards the land use systems we need? Perhaps, but for policy-makers to address farmers' needs, there is a gap in knowledge on how regenerative land use systems work, how they vary per region, what is needed to make these systems economically viable, and how policy frameworks can support farmers to integrate these methods.

Regenerative practices

The question is: does a land use system exist that addresses both the environmental and food security challenges we face? There is no one answer, but one solution is to explore the ancient practices of agroforestry and mixed farming, evaluating their potential to lead this land use transition. What distinguishes these methods? Agroforestry and mixed farming integrate trees with crops and/or livestock on the same land area, creating biodiverse landscapes where one field yields more than one crop and/or product. If managed well,

1. Hay supplement for grazing Maremmana cows in wood pastures in central Italy. Photo: Tenuta di Paganico

2. Rural landscape in Burtigny, Switzerland including rows of trees between the fields. Photo: Xavier von Erlach



this approach can increase productivity in comparison to conventional agriculture, sequester carbon emissions, regenerate soil, increase biodiversity, reduce flooding, and diversify farmers' income sources. As these systems gain recognition – such as through the EU Green Deal and CAP revision – a growing community of researchers and farmers are exploring their benefits. To support this movement, AGROMIX is bringing together a variety of stakeholders to integrate agroforestry and mixed farming into our modern food system.

A landscape approach

The transition towards resilient land use cannot be led by researchers and policy-makers alone; farmers and land managers must be at the epicenter. AGROMIX uses a holistic (or landscape) approach, considering the territory as a whole, rather than taking a narrow (or field) approach. This means collaborating with a variety of actors and 'landscapes' involved in the land use transition, from environmental, socio-economic, and political perspectives.

In terms of physical landscapes, AGROMIX partners work with 12 agroforestry and mixed farming sites across Europe, supporting land managers to reap the environmental benefits of these systems, and ultimately increasing the landscapes' resilience to climate change. In relation to socio-economic landscapes, farmers that transition to these systems will diversify their livelihoods, alleviating dependence on a single crop for their income. Furthermore, transitioning from specialized agriculture to diversified production systems will generate employment and enable farmers to incorporate resource-efficient practices based on circular economy principles.

As for the political landscape, AGROMIX uses its field experience and research to impact policies at the regional, national and international levels. The project gathers and disseminates evidence of how these production systems contribute to reaching climate change targets, thus proving the need for political action. To turn evidence and interest into action, partners will develop and disseminate policy recommendations, offering a roadmap to integrate agro-ecological principles into current land use legislation.



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3. Cinta senese pigs grazing and foraging freely in a semi-extensive system in central Italy.
Photo: Tenuta di Paganico

4. Acorn harvesting for Cinta senese pigs in central Italy.
Photo: Tenuta di Paganico

"AGROMIX is not a classic research project: here farmers are fully involved. We want to develop policies with the people who'll be affected by them, and create tools with those who'll use them."

Dr. Sara Burbi from Coventry University (UK)

Participatory approaches

In an interview with AGROMIX Coordinator – Dr. Sara Burbi from Coventry University (UK) – REVOLVE learned about the project's unique approach: "AGROMIX is not a classic research project: here farmers are fully involved. We want to develop policies with the people who'll be affected by them, and create tools with those who'll use them." Burbi explained the project's 'participatory co-design' approach, saying: "All knowledge is valid, and as researchers we need to be humble and value non-academic knowledge. By working with farmers, we access their experience, history, culture, and beliefs. It'll work both ways, we'll support them in redesigning their production systems, and they'll share with us their needs and aspirations, allowing us to design relevant and practical tools for farmers across the continent." In addition to this personal approach, AGROMIX uses innovative techniques and advanced technology to achieve its goals, and will use serious games (activities designed for a purpose other than pure entertainment) and a dedicated mobile application to engage stakeholders and facilitate this land use transition. However, involving and encouraging farmers to join in is not a simple process, and as Burbi explains: "the results will not be immediate. A shift in people's mindset is needed, and there will be a necessary transition period. Therefore, one of the objectives of AGROMIX is to support and engage all stakeholders throughout this process."

Leaving a legacy

Mainstreaming agroforestry and mixed farming is nothing short of a land use transformation, challenging the ways farmers, policy-makers, and even consumers perceive the landscapes around them. Based on its on-the-ground experience, AGROMIX will produce a variety of outputs, including: new research on how agroforestry and mixed farming can be optimized in each of Europe's agro-climatic zones; 12 online Knowledge Exchange Hubs for farmers to access knowledge, tools and guidance tailored to their region, including software, factsheets, and an interactive mobile app; tools to estimate the production and financial viability of these systems; and policy recommendations. Dr. Burbi concludes: "We want to find a new way to treat this Earth. We will share our experience of how these systems can transform landscapes of all kinds, with the ultimate goal of restoring a natural equilibrium between man and land. As long as we eat, we are deeply connected to the land, even if we don't realize it!" ●



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5. Cow eating tree in central Spain. Photo: Ulrich Schmutz

6. Water pond between wood pastures for Maremmana cows in Italy. Photo: Tenuta di Paganico



Ecosystem Restoration Camps: The Global Grassroots Movement

INTERVIEW WITH **ASHLEIGH BROWN**

Ashleigh Brown, Camp Coordinator and Co-founder of Ecosystem Restoration Camps, spoke to REVOLVE about the origins of what is today an international community working with the common mission to restore degraded landscapes and to educate as many people as possible about the value of ecosystem restoration.



1

Take us back to the beginning of Ecosystem Restoration Camps – how did it all start?

The concept was created by John D. Liu, who was working as a filmmaker in China documenting major political events. As he spent more time thinking about the arch of human history and evolution, he realized political events are just a small blip in human history, and what really matters is what happens geologically and ecologically.

He had this realization while working as a cameraman for a film about a large eco-restoration project at the Loess Plateau to revive a large area of land highly degraded by human activities such as cutting down trees and the uncontrolled movement of grazing animals. The loss of vegetation from the land had reduced its ability to hold water, creating huge floods that washed silt into the Yellow River.

The Chinese government, in partnership with the World Bank, created a program where people were paid to remove their animals and plant trees instead, rebuilding the soil structure.

After he saw how effective this project was, John changed his life's trajectory and studied ecology and soil science around the world and continued filmmaking, seeing repeatedly how ecosystem restoration could solve a multitude of problems such as desertification, food insecurity, climate change and can even help quell the flames of conflict in places where desertification has caused desperation.

John was sure this was something that everyone needed to do – but the projects he was involved in were high-level and inaccessible to everyday people.

How did the concept grow into the camps you have globally?

John had published an article in a permaculture magazine about the idea and started getting contacted by people on the Internet – myself included – which led to conversations on how we could make Ecosystem Restoration Camps happen.

The initial goal was to get 1,000 people to pledge 10 EUR/month – which we got to.

In April 2017, we secured our first camp partner, a landowner in Spain with 3,000 hectares of mixed natural and agricultural land between Almería and Granada. He leased us a five-hectare plot for us to establish our first camp – Camp Altiplano.

How did it replicate – can anybody with a plot of land apply to become a camp and how does that work?

We learned a lot of lessons from Camp Altiplano, the main one being that it is not necessary to start projects from scratch. It is not a cheap process and entails the building of structures and digging ponds for water, which isn't ideal if you want to rapidly scale up.

We had to think of a different model that would allow us to work and scale up quicker. That's when we started working with a company called Regeneration International, that works globally campaigning for regenerative land use. They have a site in Mexico called Via Organica, which was a perfect camp partner because they already had the infrastructure to house and feed and teach people and were already doing ecosystem rehabilitation. So we organized 10-day practical learning experiences multiple times a year, where people can go and take part and learn more about ecosystem restoration.

Our main goal was to focus on restoring the land rather than building new infrastructure. From there, we were able to reach out to a number of different organizations and had applications from various existing sites which opened up the idea of what a restoration camp is and could be.

Up until the beginning of 2019, we had one camp, and now in 2021 we have 37. That flexibility and openness is the reason why. We want our projects to be locally initiated and locally run. Anyone can become a camp as long as they are a group or site that are increasing the ecological function and vitality of the land around them.

1. The SEKEM-Wahat camp, located in the Bahariya oasis of the Egyptian Western-Desert, focuses on reclaiming desert soil and creating functional land. Photo: Ecosystem Restoration Camps

2. Camp Chocaya, located in the Bolivian Andes, focuses in designing and implementing an agroforestry based restoration project. The agroforestry system provides a model for how a balance between ecological values and economic gain can be achieved. Photo: Ecosystem Restoration Camps



2

You are a partner of the UN Decade on Ecosystem Restoration. Has it been helpful for you to gain additional visibility?

We have been added to a number of working groups with other UN partners and we were contacted by a researcher looking at different angles and stories for a Netflix series, so we are definitely already experiencing the benefits.

With respect to cities, is ERC going into urban areas?

While the majority of our camps are in rural areas, we are keen to develop further our influence in urban areas. We have just signed our first agreement in Los Angeles, working to restore and develop different parcels of land in the city. We are in talks with the local municipality and private landowners, even for the land beneath the iconic 'HOLLYWOOD' sign. We also have a module on urban restoration as part of our online course, with one of the most popular lessons focused on tiny forests. As a result, we have seen a number of tiny forests that have been developed due to the course.

How can people access your course?

The 9-month course is £800, all of the materials are pre-recorded, but every 25 students are given a facilitator to help guide them through the course. We also have a scholarship scheme and are trying to make it as accessible as possible. The next course starts in September 2021.

To read the full interview, visit: **revolve.media**

Ecosystem restoration is very grassroots; it's something that every single person on Earth should know about and know how to do.

VIEWS

The Team Effort to Restore the Earth

What started as a grassroots initiative has grown into a global effort to educate the masses on ecosystem restoration. With 37 active camps around the world, Ecosystem Restoration Camps has set its ambitions to bring together one million people by 2030 to restore degraded ecosystems in 100 camps around the world.

PHOTOS: **ECOSYSTEM RESTORATION CAMPS**



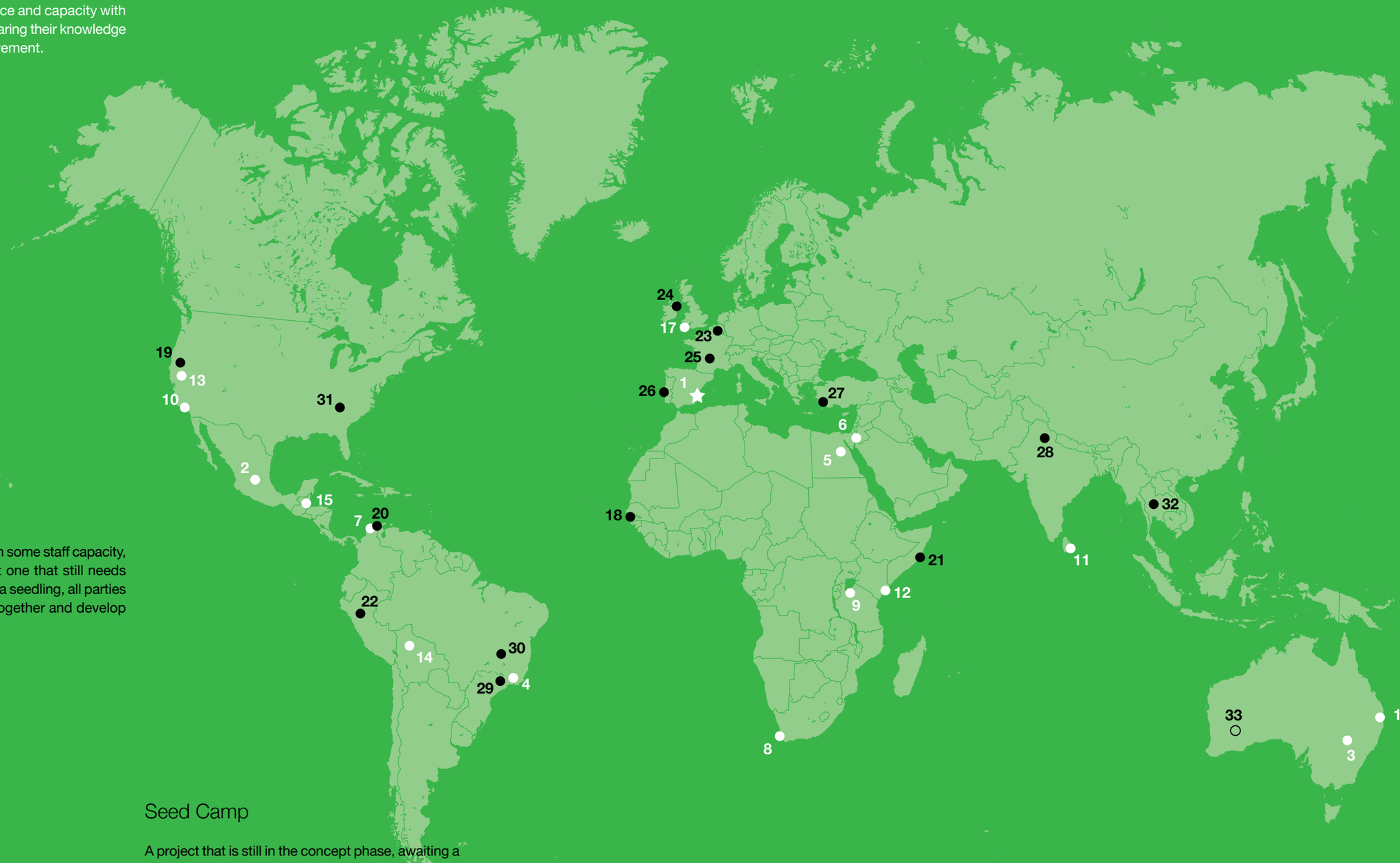
↑ **Colombia**

Campers remove elephant grass from the hillsides at Camp Mundo Nuevo to prepare the landscape for more sustainable agroforestry practices which will provide better protection against soil erosion.

Established Camp

A project that has substantial experience and capacity with restoring land, hosting campers and sharing their knowledge and expertise with the rest of the movement.

1. ★ Altiplano - Spain
2. Via Organica - Mexico
3. Reforest Now - Australia
4. Sinal Do Vale - Brazil
5. Sekem - Egypt
6. Habiba - Egypt
7. Mundo Nuevo - Colombia
8. Greenpop - South Africa
9. Mainsprings - Tanzania
10. Birdhouse - USA
11. Belipola - Sri Lanka
12. Mombasa Mangroves - Kenya
13. Paradise - USA
14. Chocaya - Bolivia
15. Contour Lines - Guatemala
16. Reforest Now - Australia
17. Embercombe - UK



Seedling Camp

A project that is in its startup phase, with some staff capacity, infrastructure, expertise and land, but one that still needs support to fulfil its vision and goals. As a seedling, all parties involved will jointly build this project together and develop the restoration work underway.

18. People's Coast - Gambia
19. Hotlum - USA
20. Jaguar Siembra - Colombia
21. Dryland Solutions - Somalia
22. Pachakuti - Peru
23. Pachaland - Belgium
24. Siolta Chroi - Ireland
25. Virsoleil - France
26. Mama Adama - Portugal
27. Functional Forests - Turkey
28. Khetee - India
29. Desperto - Brazil
30. Farm of the Future - Brazil
31. Watershed Forest Farm - USA
32. Uthai - Thailand

Seed Camp

A project that is still in the concept phase, awaiting a fixed site and team, with the intention and dedication needed for the creation of a camp.

33. Regenerate WA - Australia

↑ Spain

One of the very first campers at Altiplano in April 2017 preparing the first ever vegetable bed for campers to grow their own food. Here he is using a low impact hand tiller to prepare the ground for seed planting.

Lauren Bond, co-steward of Hotlum Eco-Regeneration Camp, makes biochar on the slopes of Mount Shasta. Heavy fuel loads, soil depletion, and drought in California have led to a growing interest in biochar.

↓ USA

↑ Kenya

Local community members demostrate their commitment to an ambitious project to plant a forest of almost 30,000 mangroves at Mombasa's degraded Tudor Cree.

Setting up native tree seedlings in a dome nursery. Sinal do Vale directly regenerates the ecosystem and acts as an educational center for sustainability.

↓ Brazil

↓ Portugal

Volunteers from the Mama-Adama Awareness Centre restore the land in the Alentejo region of Portugal where old European cork oak trees have become infected with a fungus. Each volunteer plants a tree to help form a lifelong connection with the land and restoration project.



↓ Morocco

Marking out contour lines for planting trees as part of an agroforestry system Camp Khalifah hopes to develop. Planting trees on contours slows down runoff water, reducing soil loss and surface erosion.



↓ South Africa

Three volunteers exude joy after a day of planting hundreds of indigenous trees to restore a degraded landscape as part of Greenpop's Eden Festival of Action. The festival brings people together in South Africa's Garden Route area to plant trees, paint uplifting and educational wall murals, learn through practical sustainability workshops and reconnect with nature and each other. It's a key event in Greenpop's 'treevolution'.

Photo: Juliette Bisset

↓ Brazil

Volunteers armed with tools make their way back to a site at Camp Desperto where they will restore the area around a natural water spring to improve its flow.

↑ Guatemala

Trees being unloaded at La Guaria Coccoli, one of the villages in Guatemala where Camp Contour Lines Corp. Agro-reforestation is empowering locals to create new agroforests, replacing the old practice of slash and burn. These fruit trees will be planted on contours that blend into the surrounding tropical rainforest.

↑ Australia

Volunteers at Camp Arcoora. The foundations of an intensive syntropic food and timber forest, creating mycelium networks to connect resources and advance growth. Photo: Paul Daley, A Lush Forest

Volunteers plant along the slopes of Sierra Nevada mountain range of Colombia while a member of one of the four local indigenous communities watches on..

↓ Colombia

↑ Thailand

Campers plant vetiver grass at the banks of a newly-dug pond at Uthai Forest. Vetiver grass is commonly grown in Thailand for erosion control, bioremediation, and a source of living mulch. Photo: Aleithia Low

Volunteers at Camp Via Organica in Mexico plant agave plants, nopal (prickly pears) and ocotillos (large, semi-succulent desert shrubs) in the Jalpa Valley near San Miguel de Allende.

↓ Mexico

↓ USA

Participants gathered from all over the world to join Camp Fire Restoration Project (Camp Paradise) in restoring Paradise, California, USA, after the devastating wildfire of 2018, which nearly destroyed the whole town. In this picture, the group is working at a local elementary school, revitalizing the space and planting trees. You can see the stumps of trees that were lost in the fire, are getting replaced by new life.

↑ India

Since 2018, local villagers on the agroforesty training program ran by Camp Khetee for marginalized women and youth have been implementing this way of farming in the Durdih village in Bihar, India.

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Book Reviews

WRITER: **KATARINA REIGELUTH**



The Lost City of Z by David Grann

The Lost City of Z is the tragic story of the great British explorer Percy H. Fawcett and his lifelong quest, which turned into obsession, for finding the Lost City of Z in the Amazonian jungle, as investigated and narrated by American journalist and staff writer for The New Yorker magazine, David Grann. Fawcett was the last of the individualist explorers of the vanished age of exploration who ventured into the unknown on foot with nothing more than a machete before scientists and avaricious individuals started using and exploiting technology for various scientific discoveries and personal gains.

Fawcett's military background, steely resolve, restless nature, physical and mental stamina and most importantly, respect for nature and indigenous tribes, contributed to the success of many expeditions he led to Peru, Bolivia and Brazil. The Amazon was his home and it deeply troubled him witnessing how Westerners were destroying the jungle in search of natural resources and taking advantage of the indigenous people by enslaving them and stripping them of their culture through conversion to Christianity; but worst of all, was the wiping out of entire tribes through the spread of Western diseases. In the end, who can blame the Native Americans for becoming so hostile towards trespassers?

Fawcett's experiences in the South American jungle resemble the suspenseful and thrilling adventures of Indiana Jones, only his were without a Hollywood ending. His mysterious disappearance during the last expedition is the very reason for this book's existence. Many tried to solve this mystery, only to face the same fate – death. It is estimated that at least a hundred people lost their lives in the process. David Grann on the other hand, managed to confirm the rumors already circulating about Fawcett's disappearance. He was last seen venturing into the territory of hostile indigenous tribes accompanied by his older son, Jack, and Jack's best childhood friend, Raleigh Rimell. No remains were ever found. Yet their death was not in vain as it is believed that the ruins unearthed at that location belong to what Fawcett thought was The Lost City of Z.

The Lost City of the Monkey God by Douglas Preston

Those who enjoyed David Grann's The Lost City of Z will find this book just as captivating. Although each story, its characters, and their adventures are unique, one cannot help but notice some similarities.

Perhaps the most striking, upsetting and disconcerting of them is the deforestation of the rainforest at an alarmingly fast rate. Loggers have been cutting trees down since Fawcett's expeditions in the 1900s, but the 21st century, according to what Douglas Preston witnessed in Honduras, unveiled a new trend – illegal clear-cutting of the land for cattle grazing due to an increased demand for beef imports to the United States. Obviously, our short-sighted civilization keeps repeating the calamitous mistakes of the past with no regard for the future with devastating outcomes. These include the change of the rainforest's entire ecosystem, climate change, extinction of exotic plants and animals, as well as the uprooting and relocation of many indigenous tribes. In this book, Douglas Preston examines not only some of the current issues of modern society, but also addresses the ethical questions related to the use of technology in the field of archaeology that, until recently, used to be exclusively man-mapped.

The Lost City of the Monkey God takes place in the Honduran rainforest in a region called La Mosquitia, also known as the Gates of Hell or the White City. It is one of the most dangerous places in the world, not only because of its deadly animals and poisonous vegetation, but also because of archaeological looters, illegal loggers and narcotics traffickers who use it for their business operations. In 2012, Steve Elkins and his team of scientists went on a quest to find the legendary White City, which they achieved by utilizing a space-age technology – lidar – that has never been used before as a tool of archaeological exploration. The discovery was stunning and beyond any expectation. What they uncovered were hundreds of miles of ruins and settlements of unknown civilizations so advanced and complex for that time, that according to some archaeologists they are equivalent to the Egyptian pyramids.

Once again, we see how one man's dream, his determination. and perseverance – even in light of life-threatening conditions – can lead to implausible discoveries. In the process, The Lost City of the Monkey God also helps to promote environmental awareness and address one of the most prominent environmental issues of our time – deforestation.



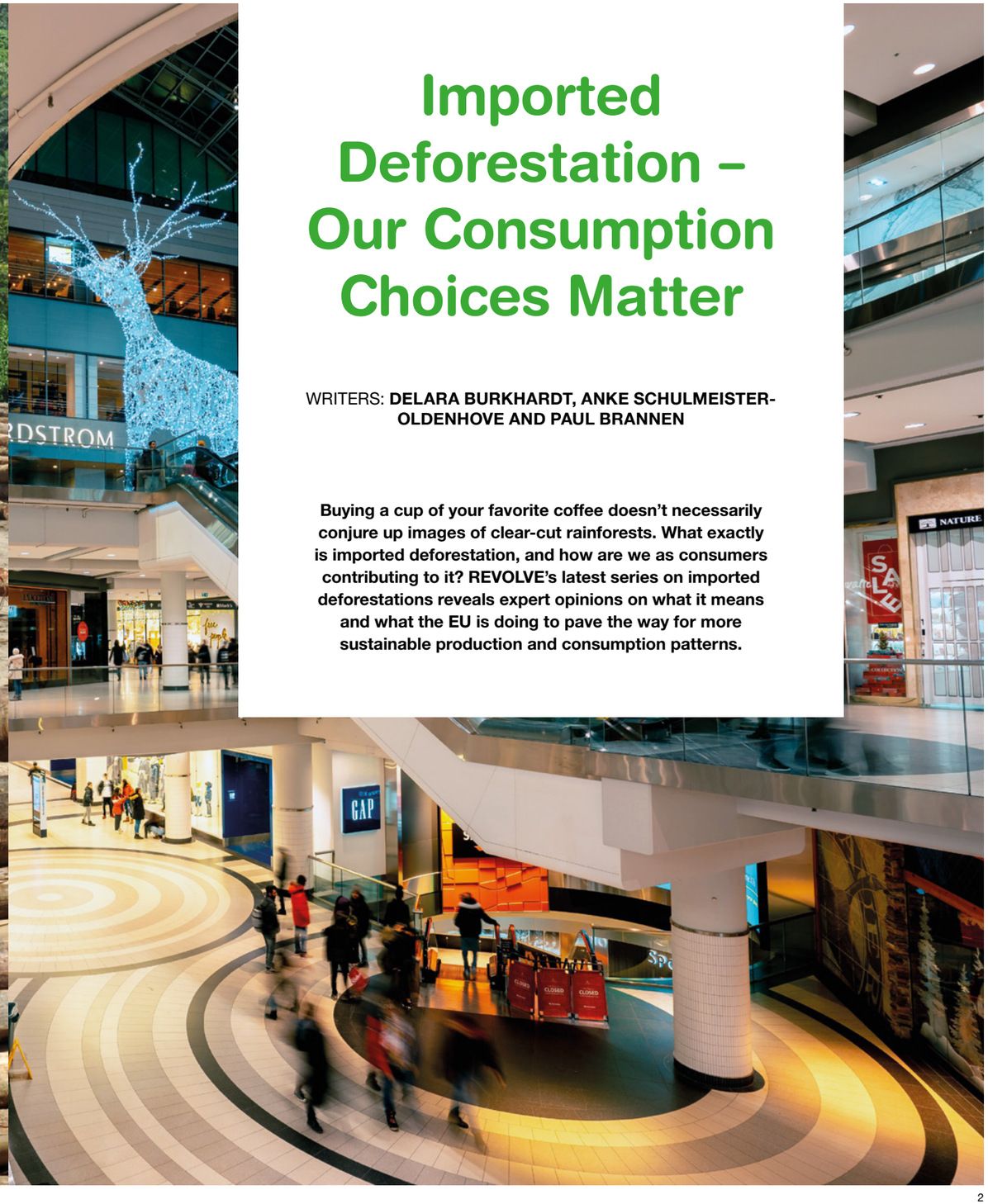
Imported Deforestation – Our Consumption Choices Matter

WRITERS: **DELARA BURKHARDT, ANKE SCHULMEISTER-OLDENHOVE AND PAUL BRANNEN**

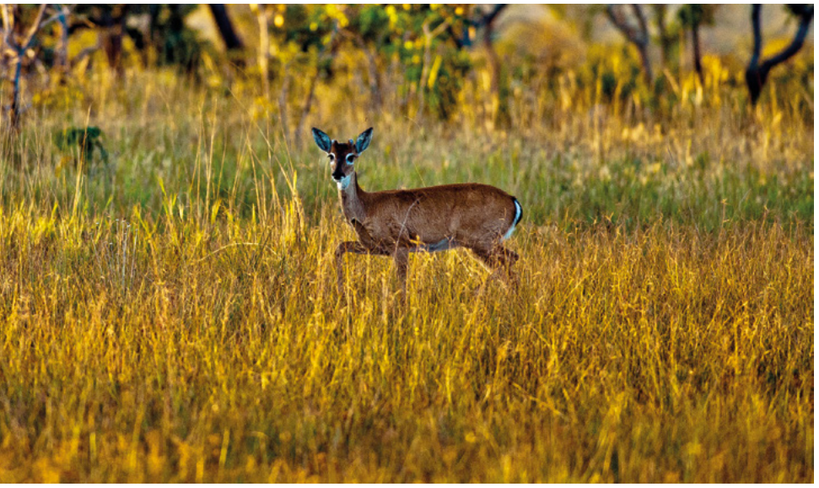
Buying a cup of your favorite coffee doesn't necessarily conjure up images of clear-cut rainforests. What exactly is imported deforestation, and how are we as consumers contributing to it? REVOLVE's latest series on imported deforestations reveals expert opinions on what it means and what the EU is doing to pave the way for more sustainable production and consumption patterns.



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Interview excerpt with Delara Burkhardt, Member of the European Parliament (S&D Group), leading the introduction of European rules for deforestation-free supply chains.

Why is the term ‘imported deforestation’ so important for people to understand?

Within the EU we have achieved a turnaround – the forested areas on our continent are growing again. But the global picture is different. Last year was a wake-up call. We all still have images of the burning Amazon in our minds. But this is not just a Brazilian issue, in the EU too we share responsibility for the destruction of the rainforests. Our consumption in Europe is responsible for about 10% of the world’s forest destruction.

Soy cultivation and meat production alone are responsible for 80% of global deforestation. About one-fifth of soy and meat imports from Brazil to Europe are linked to illegal deforestation, as scientists pointed out in the scientific journal Science this summer.

Or take leather as an example – research by the NGO Earthsight revealed that a well-known German car manufacturer purchases leather for its luxury cars from Paraguayan tanneries linked to illegal deforestation in Paraguay via its Italian supplier. Therefore, rainforests around the world are destroyed for the things that end up on our plates – or even in our cars. That is how we import deforestation.

What does this imply for the European consumer?

The problem is that when we drink coffee in Europe, or eat chocolate, we cannot be sure that rainforests have not been destroyed to make way for agricultural land for the coffee, cocoa or palm oil in it – or for the leather of the car seats we sit on. Because so far there are no rules in the EU on this.

Simply sticking a label on a product to signal they are deforestation-free, will not solve the problem. The European Parliament is skeptical of this instrument, as it puts the burden to decide on the consumer. When filling up their fridges, consumers should not have to choose whether they want to contribute to deforestation. What is needed are mandatory rules for due diligence by companies putting commodities on the European market that are potentially risky for forests. They should check and make sure that their products do not come from land that was forested or another valuable ecosystem before. Deforestation-free products must become the norm in the EU. It’s not a “nice-to-have” for marketing purposes, it’s a must-have for the survival of the planet.

“The problem is that when we drink coffee in Europe, or eat chocolate, we cannot be sure that rainforests have not been destroyed to make way for agricultural land.”

Feature excerpt with Anke Schulmeister-Oldenhove, Senior Forest Policy Officer, WWF European Policy Office, on deforestation as one aspect of imported goods’ impacts on all ecosystems.

In 2020, 1.1 million people joined the #Together4Forests campaign demanding a strong law to tackle the EU’s footprint on forests and other ecosystems. This was the largest-ever public participation on an environmental topic in the history of the EU, clearly calling for an end to EU-driven deforestation and nature destruction. .

2020 was also a year of unprecedented deforestation and fires in the Amazon. As we speak, commodities such as soy (which we mainly import to feed our livestock in Europe), beef, palm oil and cacao are all getting the green light to enter EU markets, regardless of whether forest or other natural habitats are being cleared in the process – be that “legally” or illegally. We may not be the ones destroying iconic landscapes like the Amazon rainforest and Cerrado grassland first-hand, but by accepting these products into our supermarkets, without any questions asked, the EU is part of the problem, when it should be part of the solution.

The ball is now firmly in the court of the EU institutions to make the law citizens have called for a reality. There have been some good signs already: The European Commission reaffirmed its commitment to propose new deforestation legislation in 2021, with pledges coming in from President Ursula von der Leyen during the One Planet Summit in January 2021, as well as from Executive Vice-President Frans Timmermans and Commissioner Virginijus Sinkevičius at the end of 2020 when formally receiving the 1.1 million submissions through the #Together4Forests campaign, which was led by WWF, Greenpeace, ClientEarth, Conservation International and the Environmental Investigation Agency, and supported by more than 160 civil society groups. The European Parliament also passed a resolution laying out its proposal for an ambitious law to halt EU-driven deforestation and nature destruction. These commitments lay strong foundations for a good legislative proposal in 2021.

WWF and other environmental groups have spent years advocating for a strong law to tackle EU-driven deforestation and nature destruction. Whilst a new EU law to protect the world’s forests is urgently needed, it also needs to be

1. Logging in Sabah, Malaysian Borneo: tall dipterocarp rainforest trees are most commonly felled. Photo: T. R. Shankar Raman

2. Shopping mall. Photo: Sunyu Kim

3. The Brazilian Cerrado is one of the most biodiverse grasslands on the planet. Photo: Bento Viana / WWF Brasil

4. 50% of the Brazilian Cerrado has been lost largely due to the unsustainable production of soy and livestock. Photo: Bento Viana / WWF Brasil

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effective in ensuring commodities and products placed on the EU market are not linked to the destruction of other natural ecosystems, such as grasslands, wetlands and mangroves. For example, the expansion of cattle pastures and soy fields is replacing Brazilian rainforests and grasslands alike. So far, the European Commission has not clearly stated whether ecosystems other than forests would be covered by the new deforestation law. If the EU's new legislation were to focus solely on addressing deforestation, it would be a puzzle where a big piece is missing, and not address increasing pressure on other related natural habitats. whether ecosystems other than forests would be covered by the new deforestation law. If the EU's new legislation were to focus solely on addressing deforestation, it would be a puzzle where a big piece is missing, and not address increasing pressure on other related natural habitats.

These "other" ecosystems are rich in biodiversity and are essential for our climate, benefits which are often wildly underestimated. For instance, the Brazilian Cerrado (50% of which has already been lost, largely due to the unsustainable production of soy and livestock) is one of the most biodiverse grasslands on the planet, housing a third of Brazil's biodiversity, including jaguars and giant anteaters. This natural haven is also crucial for our climate, storing around 13.7 billion tons of carbon dioxide, and often referred to as an "inverted forest" as it contains underground stores of carbon similar to or greater than those found in more productive forests. While EU soy and beef imports are not the only ones driving the destruction of the Cerrado, they constitute a significant piece of this bleak picture since the EU is the second largest market for Brazilian soy after China, and EU soy imports are more likely to be tainted by deforestation as they are sourced from so-called "deforestation fronts," like the Cerrado.

If the EU does not play its legislative cards right, it runs the risk of ignoring its true impact on nature worldwide. If the EU is serious about addressing its impact beyond its borders, it must get to the root of the cause and ensure this law does not leave the job half done. WWF strongly believes that the EU's new deforestation law must ensure that no product or commodity placed on the EU market is linked to the destruction of forests and other natural ecosystems, nor to the violation of human rights, in particular those of indigenous peoples and communities.

We may not be the ones destroying iconic landscapes like the Amazon rainforest and Cerrado grassland first-hand, but by accepting these products onto its supermarket shelves – no questions asked – the EU is part of the problem, when it should be part of the solution.

Opinion excerpt with Paul Brannen, Former Member of the EU Parliament and CEI-Bois & EOS Public Affairs Director, provides an industry perspective of how the European woodworking sector combats deforestation driven by imported commodities.

One has to remember that the primary driver of deforestation is land use change: as populations grow and economies develop, forest land is being cleared for conversion to food agriculture and other crops, mining activities, urban and infrastructure development (source: FAO). Timber and timber products from sustainably managed forests are not linked to global deforestation; on the contrary, deforestation prevents the future availability of wood material, whereas forests sustainably managed and with long-term economic value stay as forests.

The European Woodworking Industries have been pioneers in fighting illegal logging and improving the legality of the production and sale of sustainable timber.

Primary processing industries in the EU – such as the sawmill industry – source more than 95% of their wood raw materials in Europe, where adequate legislation on ensuring sustainable forest management is in place. According to the data collected by Forest Europe, the European forest area increased by 9% over the past 30 years and, with 227 million hectares, now covers more than one-third of Europe's land surface. The EU sawmill industry complies with and enforces the requirements imposed by the European Union Timber Regulation (EUTR). Most of the EU sawmills supply customers with either PEFC or FSC controlled material. Additionally, the European sawmill industries are investing in the best technologies available on the market to guarantee the traceability of purchased logs. Wood traceability is a computer-based system that ensures that every log (and sawn wood derived from it) can be promptly identified. Traceability is beneficial both for companies and the consumers, providing better quality for wood products. Using technology to trace the movement of timber guarantees transparency and legality and ensures that the supply chain data is 100% accurate from the forest to the sawmill plant.

The EU Timber Regulation (EUTR) ensures that the less than 5% of the timber entering the EU market sourced from outside the EU has been harvested and traded in compliance with the laws of the producing country. To meet EUTR requirements, EU companies must subject suppliers to legality assurance due diligence, so they can demonstrate that products are legally sourced, with appropriate documented evidence and means of tracking along the supply chain. Where there is uncertainty, they must undertake further illegality risk mitigation, which can involve on-the-ground inspection of suppliers.

The European timber traders also support supply-side measures aimed at improving forest governance in producing countries, such as Forest Law Enforcement, Governance and Trade (FLEGT). This involves supplier countries entering a Voluntary Partnership Agreement (VPA) with the EU, which binds them to establish a national timber legality assurance system, supported by forest products traceability, independent auditing, monitoring and licensing frameworks. They must also, where necessary, implement forest governance reform and ensure that a broad spectrum of stakeholders, including businesses, local communities and NGOs, are consulted and involved in forest sector decision making.

Indonesia was the first country to fully implement its VPA and started FLEGT licensing EU exports in 2016, but an additional 15 are engaged with the initiative, accounting for 76% of the total tropical wood imports in the EU. Six countries are currently implementing the VPA Agreement (Cameroon, Central African Republic, Republic of the Congo, Ghana, Liberia and Viet Nam), and nine are in the negotiation phase. Increasingly, a FLEGT VPA is also being seen as laying the groundwork for sustainability certification, having a range of elements in common with the principles and criteria of the independent certification schemes, such as forest products traceability, forest governance reform, and insistence on social inclusion and welfare assurances.



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More can be done to accelerate such process, including an increased recognition of FLEGT-licensed timber on the EU market, along with a better implantation of EU Timber Regulation and a more consistent enforcement of the EUTR across Europe; but overall, the EU woodworking industry offers a positive example and a potential model for new measures aiming to support the trade of deforestation-free commodities.

5. EU Flegt Facility, Republic of Congo. Photo: EU Flegt

Interview excerpt with Joanna Macrae, Co-Head of International Agriculture, Forests and Land Use at Defra, providing insights on what steps the UK – host of COP26 – is taking to counter deforestation and protect habitats around the world.

How is the UK working to counteract forest-loss around the world and addressing imported deforestation?

Recognizing the rapid rate of forest loss globally, the Government's 25 Year Environment Plan made a commitment to leaving a lighter footprint on the global environment, by enhancing sustainability and reducing the impact of supply chains on the world's forests. We are taking forward domestic measures and are working with countries across the world to reduce deforestation and its impacts on climate change and biodiversity loss.

Our new due diligence legislation will target illegal deforestation, requiring larger businesses, who typically use commodities in significant volumes, to make sure commodities they use have been produced legally. Businesses that do not comply with the law would be fined.

This approach will clean up the UK's supply chains, ensuring there is no place for illegally produced commodities on our supermarket shelves.

We believe that working in partnership with producer countries to strengthen the enforcement of their laws is the most effective solution to protecting forests, which are so crucial to all of us.

What steps is the UK taking to protect habitats from conversion?

No single solution will be able to protect all habitats from conversion. The drivers of deforestation are varied, and so too are the mechanisms best able to address them.

The Government is working with countries across the world to support sustainable agriculture and incentivize the protection of vital ecosystems. One of the ways we want to capitalize on our forthcoming co-Presidency of the UN Climate Change COP26 is to accelerate a global transition to more sustainable supply chains by bringing together producer and consumer countries of forest risk commodities to share perspectives and take action.

Our approach has been designed to avoid a situation where, by protecting forests, producers are incentivized to illegally convert other types of ecosystem. It does this by requiring that forest risk commodities must be produced in line with local laws protecting important natural ecosystems – not just forests.

The actions support our work making nature one of the main themes for the UK's COP26 Presidency to help increase investment in nature-based solutions and tackle the drivers of nature loss such as deforestation.

As President of COP26, we are working to forge a new alliance between governments to ensure global supply chains are sustainable.

Last year, nearly 80 countries signed the Leader's Pledge for Nature, committing to reverse the destruction of nature by 2030. The UK played a key role in crafting the pledge, and as hosts of the next and all-important UN Climate Conference.

To read the full interviews and articles, visit: revolve.media



6. Illegal logging in the Amazon rainforest, Brazil. Photo: Camilla Costa

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Forests Are Allies of Human Health

WRITER: **ANNE-LISE AVRIL**

Forests create a wide variety of ecosystem services essential to human health and well-being on a daily basis. They are the world's largest terrestrial carbon sink and the main source of terrestrial biodiversity. They provide 75% of the freshwater available to humanity, supply us with a natural pharmacy with species known for their medicinal properties, act as barriers against pandemics, generate edible products consumed by 100 million Europeans, and provide energy for more than 2 billion people on Earth. Forests alone represent one of the main pillars of human development, guaranteeing harmony with nature and peace between nations. It is essential to recall that now, more than ever, our future depends on forests in a context where humanity faces increasing health risks; the World Health Organization (WHO) tries to warn us against and where the COVID-19 pandemic (which killed more than 2.5 million and infected tens of millions of people in a year), foreshadowing the emergence of even more severe pandemics in the future.

1. Photo: Meiying NG

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Forests and food security

Berries, mushrooms, plants, roots or game: forests are genuine open-air pantries that provide for the needs of 25% of the world's population. They also help to provide clean water to agricultural land by protecting watersheds and are therefore essential for agriculture and food security at a global scale.

Since our health heavily depends on our diet, the FAO estimates that global agricultural production is expected to increase by 60% by 2050. This figure reflects the need to feed the world's population, expected to exceed nine billion people by the middle of the century. Yet, agriculture is by far the leading cause of global deforestation. More than half of the world's deforestation is directly linked to the conversion of forests into crops or pastures. This has a direct impact on food security and health, especially for the most



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vulnerable populations witnessing the reduction of water and edible products from trees.

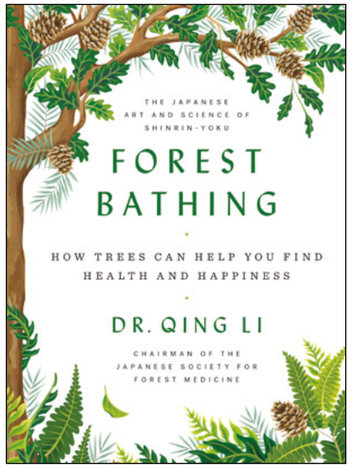
Reconciliating forests and agriculture is essential and possible. Substantial benefits can be provided by conserving or planting trees on farmlands and creating agroforestry systems: supplying livestocks with fodders, creating tree covers to protect underlying food crops, or enriching soils with nutrients released by the trees. The presence of diversified forests near crops is also instrumental in boosting agricultural productivity, particularly through pollination. Butterflies, bees, types of flies, birds (hummingbirds) or mammals (bats) provide for about one-third of the world's food production (fruit, vegetables, oilseeds, certain legumes, coffee, cocoa, spices), three-quarters of which are food crops. Consequently, without the services provided by forests, crops, food – and therefore human health – would be jeopardized.

2. Agroforestry contour planting at "The Hill", Australia where a number of innovative practices have incorporated trees into a progressively regenerative system. Photo: Pixture2016

3. Agroforestry in Masaka, Uganda. Photo: Dan Frendin

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Forests and human well-being

Forests have a direct impact on our physical and mental health. Following its emergence in the early 20th century in Europe as a cure for tuberculosis, sylvotherapy, also called "forest bathing" or "Shinrin-Yoku", is extensively used in Japan, where it was recognized as a medical treatment in 1982. Studies conducted by Dr. Miyazaki and Qing Li prove how a walk in the forest benefits our body and health. When living or walking in the forest, human beings benefit directly from the defense molecules emitted by trees: phytoncides and terpenes play the role of volatile essential oils which increase the number and activity of lymphocytes (guarantors of our immunity) while decreasing blood sugar levels and cardiovascular risks.

Forest bathing also impacts our moral health. Phytoncides and terpenes increase the activity of the parasympathetic nervous system, reducing stress hormones and blood pressure, influencing our ability to relax and sleep better. Furthermore, the risk of depression is reduced by 10% if you walk in a forest or wooded area for half an hour a week. Being in contact with trees reinforces these calming effects, allowing us to absorb their energy and draw our strength and well-being from their vitality.

Trees also affect social cohesion: within cities, wooded areas are conducive to encounters, contribute to reducing isolation and strengthening social ties. Urban green spaces also known to help to reduce crime rates. In the United States, Baltimore has one of the highest crime rates in the country; however, areas containing forest covers have seen a 12% drop in crime.



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4. Li Q. Forest Bathing. The Japanese Art and Science of Shinrin-Yoku – How Trees Can Help You Find Health and Happiness. Viking Books (Penguin Random House USA), New York, USA, 2018.4, pp.1-309.

5. Forest walk in Dakhovskaya, Adygea Republic, Russia. Photo: Dmitry Gladkikh



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Forests, our allies against heat waves and pollution

The benefits of trees in the city are multifold. They improve biodiversity, play an important role in rainwater management, prevent soil erosion and reduce noise pollution. But they also help reducing urban pollution and heat islands, positively impacting the health of urban inhabitants. Knowing this is crucial to building the cities of tomorrow, which will be home to three-quarters of the world's population. Today, air pollution has become the main enemy of the health of city inhabitants. According to the World Health Organization (WHO), it kills 3.7 million people each year worldwide. This number could almost double by 2050, climbing to 6.2 million people. Moreover, the WHO considers that heat waves could cause the death of 256,000 people each year in urban areas by the middle of the century.

However, the trees' capacity to absorb CO_2 and produce our oxygen is combined with their ability to capture other atmospheric pollutants, such as fine particles, mainly emitted by heating buildings and car use, and classified by the WHO as carcinogenic, responsible for cardiovascular disorders. In addition, when producing humidity and providing shade, trees help to cool the atmosphere and thus counter increasingly frequent heat waves. Since high temperatures lead to a poor air circulation and to increased pollutant emissions, trees also have an indirect effect on pollution.

Planting urban forests would thus help reducing the concentration of fine particles by 20% to 50%, according to a report by the NGO Nature Conservancy, and cooling the ambient urban air by 2 to 8°C, according to the FAO. Urban forests would then help to reduce our air-conditioning needs by 30% and save from 20-50% of energy.

Our health depends on the health of forests

Introduced in the early 2000s by the World Health Organisation (WHO), the Food and Agriculture Organisation (FAO) and the World Organisation for Animal Health (OIE), the "One Health" concept is a reminder that human and natural ecosystems, particularly that of forests, are interdependent. One of the consequences of deforestation is the increased contact between humans and wild animals. Viruses and diseases carried by these animals, which used to be confined to remote areas, now find new potential victims among human populations. Climate change is also an aggravating factor, as it encourages many animal species to migrate in order to survive, since their natural habitats were modified by climate change.

Nipah, one of the most dangerous viruses we know of, illustrates how animals transmit infections to humans, probably as a consequence of deforestation. This virus appeared in Malaysia in the late 1990s, in a region highly impacted by deforestation due to the development of pig farming. The fruit bats that lived



6. Berlin, Germany. Photo: Markus Spiske

7. Tai Po Waterfront Park, Hong Kong. Photo: Wpcpey

8. Trees help to cool the atmosphere and thus counter increasingly frequent heat waves. Photo: Maximilian Scheffler

9. Greater short-nosed fruit bat - photographed in Batticaloa, Sri Lanka in daylight while it was moving branch to branch. Photo: Anton Croos



in the forest were forced to find other food sources, and therefore fed in the orchards of the nearest farms. Their saliva and urine contaminated the fruit eaten by pigs, which in turn contaminated nearly 300 locals.

COVID-19 is also part of the long list of viruses carried by wildlife. Coronaviruses are quite common in some wild animals, particularly bats, but also in birds. An article published in March 2020 in the journal Nature describes the results of a study conducted by researchers on a COVID-19 genome. They concluded that a very similar virus is carried by bats and pangolin species, reinforcing the risk of human transmission.

Through the destruction of forest ecosystems, deforestation creates imbalances conducive to the emergence of new infectious diseases. This phenomenon was demonstrated by a 2016 international study conducted by French Research Institute for Development, Inserm and Bournemouth University researchers. If these ecosystems continue to be destroyed, pandemics are likely to become increasingly frequent.

Forests play a key role for human health. Preserving forests around the world is not only about protecting biodiversity, it is also about preserving our health. We all have a role to play in this: as citizens, we have to question our lifestyles and consumption habits but also encourage our governments to implement more environmentally friendly development methods; as companies, we need to measure our activity's footprint on biodiversity and implement appropriate strategies. While the UN Decade for Ecosystem Restoration begins in 2021, many international initiatives are flourishing, seeking to act as quickly and strongly as possible to restore forest ecosystems and reforestation on a global scale over the next ten years. These complementary and urgent actions will together provide a significant part of the global response to the climate and biodiversity crisis, and will help to preserve human health as well as preventing future health crises.



10. Illegal deforestation near Saen Monourom, Mondulkiri Province, Cambodia. Photo: Christian Pirkl



Integrating Urban Greening in City Planning

WRITER: **PRIYANKA BHIDE**

India has made several important commitments, such as the Nationally Determined Contributions (NDC) on climate change and the Bonn Challenge, to protect, conserve and promote forests. Yet the struggle to balance biodiversity priorities with those related to economic progress and growth persists. Achieving this fine balance while also dealing with the exigency of climate change is a challenge, however, it also provides a unique opportunity to integrate urban forests in city development plans.

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Urban forests include the various patches of green in urban areas: parks and public gardens, greenery along streets and residential areas, river ecosystems, wetlands, as well as green belts in surrounding areas that also have an impact on these spaces. Better integrating these into the urban environment, especially at the planning level of tier 2 cities and upcoming urban areas, could be the game changer for India in meeting its national and international targets.

While forests play a critical part in the delicate balance of ecosystems, urban forests also provide much needed respite to citizens, and a space for communities to come together. Trees have been proven to help reduce the impact of carbon emissions and contribute to climate change mitigation. A fully grown tree can absorb up to 150 kg of CO_2 per year, and intercept over 15,000 liters of water per year, thereby reducing the risk of floods. Clearing out trees in large numbers for infrastructure development not only destroys the natural habitats of wildlife, but can also impact temperatures. Trees can cool the air from between 2°C and 8°C, and as such are vital to cool increasingly concretized urban structures. It is important to remember that trees are a part of a larger forest ecosystem, which work together while balancing the needs of our planet. In relation to urban planning, where the felling of trees in one area is often compensated with the planting of saplings in another, we must consider viewing ecosystems with a wider lens in the approach going forward.

1. Public park in Patiala, Punjab, India. Photo: Dollar Gill

2. Contruction work on the Mumbai metro project. Photo: Mihir Samel

3. Buffaloes grazing in Aarey Milk Colony, Mumbai, where the construction of a train depot had been planned. The depot was relocated due to significant protests. Photo: Sanferd Rodrigues

4. Zakir Hussain Rose Garden, Chandigarh. Photo: Harvinder Singh

5. Panoramic view from Matrimandir View Point in Auroville, Pondicherry. Photo: Piyush Pujari



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India's urban planning

To keep up with increasing urbanization, cities in India have had to ramp up urban infrastructure rapidly, often at the cost of urban green spaces. According to the U.N. World Urbanization Prospects 2018 report, around 34% of India's population already lives in urban areas. The city of Mumbai, India's commercial capital, lost 22.6% of its green coverage in the decade spanning 2001-2011 primarily due to a spurt of residential and commercial development in the suburbs. The Mumbai metro project, that has come under fire from activists for large scale felling of tree cover, gives hope to the city of over 21 million people, many of whom commute to work daily in overcrowded trains (over 8 million commuters traveling on around 2,800 trains per day) and overcrowded roads (vehicle density of 28,380 per 100,000 population). In order to build the above ground metro, many trees have had to be cut down. The most significant protests by activists in 2019 against the proposed felling of trees were at Aarey milk colony, an area with over 500,000 trees, leading to the relocation of a planned train depot. The change in plans however, some say, may cost over $500 million. In such situations, more planning at the project development stage could have minimized the damage.

Nagar Van Udyan Program

The Nagar Van Udyan Program aims at developing 200 Nagar Van (city forests) across India by reaching out and engaging local communities, educational institutions and other organizations. Once established, these forests will be run and maintained by the state government. As part of the scheme, small nurseries will also be created in schools, helping to engage students.

Going green

Integrating urban greening in any development plans will be essential if India is to meet the NDC target of creating an additional carbon sink of 2.5 to 3 billion tons of CO_2 equivalent. This is to be achieved through additional forest and tree cover in India by 2030. Government actions signal an acknowledgment of the importance of forests. In 2014 the Town and Country Planning Organization of the Government of India's Ministry of Urban Development released a set of Urban Greening Guidelines. These recognize the need for green spaces to be planned, designed, developed and managed. In his keynote speech at GIZ India's Green Cluster conference on 'The Future of India's Forests', Siddantha Das, Director General and Special Secretary at MOEFCC, lists three objectives of forest management in India: conservation of resources; protecting the forest as a carbon sink; and ensuring the livelihoods of the people.

Despite the challenge ahead, there have already been success stories in

India. The south Indian city of Auroville, based on a master design by the French architect Roger Anger, has a 2.5 km wide green belt around the city zone that reduces the severe effects of climate change. Chandigarh, another city planned by the architect and urban planner Le Corbusier, has an 8 km long linear park 'Leisure Valley' that runs along the city's center, in addition to green areas in every neighborhood sector. Even today, after several decades of growth and expansion, Chandigarh's green areas continue to grow; the city has around 1,807 municipal parks and 41% tree coverage. There is also still an opportunity for greening strategies to be considered in the smaller, tier two metros, that are not yet in the stage of rapid growth, and such planning may be possible.

Urban Forest Garden Project, Pune

As part of its urban afforestation program, the Union Government has established the Urban Forest Garden Project in Pune. The aim is to increase the tree coverage around cities in attempt to counteract the hazardous effects of rapid urbanization. The project brought together volunteers – from NGOs to school children – from across society to come together and plant trees.

Increasing the reach of forests

In an encouraging development, on World Environment Day 2020, the Union Environment Minister, Shri Prakash Javadekar announced the implementation of the Nagar Van Scheme, through which over the next five years 200 urban forests are to be developed across the country. This is in addition to the existing National Afforestation Program and Integrated Development of Wildlife Habitats. The targets will be achieved through a Public Private Partnership (PPP) model, involving local communities, local bodies, civil society, and the private sector, as well as the concerned government departments.

There is still a need to integrate the ongoing efforts into a larger campaign around urban forests, setting targets like those that were successfully met for sanitation through the National Swacch Bharat campaign. Such a campaign must also consider a wider perspective on urban forests to also include other areas of ecological concern, such as wetlands. For India, the adoption of initiatives such as Nagar Van by both state and city actors will be a deciding factor in how rapidly it can move towards reaching its greening goals.

6. Pune, Maharashtra, India. Photo: Onkar Gotale



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REVOLVE Circular

Circular Perspectives for Linear Mindsets

Delve into the logic of innovative thinkers from four corners of the globe

How did linear thinking succeed in dominating our mental infrastructure? What can be done to change the linear mind-set of corporate and political leaders, and what should consumers do if they want to move away from linear products, culture and lifestyles? REVOLVE Circular spoke with four innovative thinkers to find out.

Ashish Kothari is the creator and main proponent of the concept of Ecological Swaraj in India, also called Radical Ecological Democracy. In our interview, Ashish Kothari particularly points out the pluriverse of alternatives to 'development' that are either part of ancient systems of living in harmony with the earth, or new innovations including from within industrialized, Western societies.

Doryn Negesa is a Ugandan Doctoral Researcher at Tsinghua University in Beijing, China. Her focus is on the sustainable development of eco-industrial parks in Africa. She believes that sustainability and a circular economy are the key to redefining Africa's economic development.

Kyle Ritchie is the Founder of the Circular Economy Studio and the Education Sustainable Design Lead for Cannon Design in Chicago; he is best known for his new book *Circular Economy for Dummies* to be published in April 2021.

Walter R. Stahel is a Swiss architect and author of *The Performance Economy;* he has been influential in developing the field of sustainability, by advocating 'service-life extension of goods - reuse, repair, remanufacture, upgrade technologically' philosophies as they apply to industrialized economies.

"The problem with the linear economy is it accepts the false premise that 'waste' – or a valueless object with no future potential to provide a service – is a real thing."

Please allow us to start with a big question, or rather two: What is wrong with the linear economy? Since when?

Ashish Kothari:

Since colonial times, or more precisely post-WWII, the predominance of classical and then neo-liberal economics has classified the entire world in linear fashion. 'Developing' and 'developed,' traditional and modern, primary-secondary-tertiary sectors, and so on, have become not only classifications but also normative directions in which to move. This approach, originating in the North/West, cleverly disguised the real aim of gaining worldwide control to enable American and European economies to revive from the ruins of the war, by convincing other countries and regions that they all have to follow in their footsteps, and that they will generously aid in this process.

The categorization is also based on highly reductionist ways of thinking, e.g. defining 'developing' and 'developed' based on simplistic criteria such as GDP, or size of the economy measured in predominantly financial terms. This means that highly sophisticated ways of thinking, knowing, doing, and being that have characterized other regions of the world were considered 'backward', to be replaced by modernist, 'scientific' epistemologies, and ontologies. Communitarian ways of life focused on the commons were to be replaced by individualistic, privatized systems, and integrated material-spiritual-cultural ways of life by a separation amongst these.

Doryn Negesa:

The linear economy undermines biodiversity. There is a take-make-dispose mentality where the linear economy assumes a constant supply of natural resources. The linear way fuels a culture of excessive consumption and creates more waste than is sustainable in the long-term. The biggest problem with the linear economy is on ecology and the economy; the ecological downside is that the production of goods is at the expense of the sustainability of the ecosystem, and the economic downside is on the prices of raw materials as they fluctuate due to scarce materials and geopolitical dependence on different materials.

"The majority of people alive today were born into a world where 'waste' was as normal as air, water and color TV."

Kyle Ritchie:

The problem with the linear economy is it accepts the false premise that 'waste' – or a valueless object with no future potential to provide a service – is a real thing. But it's not. To industrialized societies, waste is an inevitable reality for material lifecycles and a necessary tool to drive economic growth. By looking at the natural world we rely on, however, we clearly see there are no observable instances of "waste" occurring naturally – aside from heat, really. In this absence of waste, what do we see? Abundance, resilience, and environmental systems so complex even the smartest humans couldn't replicate them.

Walter R. Stahel

The linear industrial economy started with the industrial revolution. Before that, a majority of people lived in a forced circular economy of scarcity and poverty.

Industrial mass production of almost anything enabled societies to gradually overcome scarcities of food, shelter and clothing. Manufacturers only optimize production flows up to the point of sale, where both ownership and liability of objects are transferred to the buyer, who passes the responsibility for derelict objects and 'waste' to the municipality. Economically, manufacturers internalize profits and externalize the cost of risks during the use of objects to the buyer, and end-of-life costs to the taxpayer. This linear system from mines to the point-of-sale and on to landfills was tolerable until 1945 because 'waste' either had a value and was collected or was disposed of in Nature which slowly absorbed it.

After 1945, the scientific progress enabled humankind to manufacture objects made of synthetic materials, which were outside nature's absorption capacity, both quantitatively and qualitatively. Derelict objects were still collected by municipalities and treated by recyclers or incinerated, but substantial numbers ended up in the environment.

Framework conditions push recyclers to eliminate waste instead of incentivizing them to preserve the value of objects and materials. And despite increasing environmental impairment, politics continue to support the linear economy.

Has linear thinking succeeded in dominating our mental infrastructure? If yes, then how?

Ashish Kothari:

In the last 75-80 years since 'development' got defined in the above way, it has been planted in people's minds across the world with a clever mix of financial incentives and arm-twisting by structures such as the Bretton Woods institutions, as also cultural messaging about what is the 'good life'.

Linear 'development' is also subtly equated to the unfolding of the baby in the womb into a full human adult, or of the progression of a seed into a tree; biological evolution is equated to the evolution of societies from developing to developed. Virtually all countries have imbibed these, and their own elites have pushed them into school textbooks, economic plans, political manifestos and the like. Even as such approaches to the economy have created enormous inequalities and ecological devastation, a vast number of people still remain convinced that they need 'development,' and that even if they are not benefiting right now, one day they too will reach the levels of economic wealth and comforts that the rich are enjoying.

Doryn Negesa:

I do not think so. If it had indeed succeeded, we would not be veering toward the circular economy. It is something that had initially been rooted but is now being replaced by transformed thinking through the transition to circular economy.

Kyle Ritchie:

The majority of people alive today were born into a world where 'waste' was as normal as air, water and color TV. So yes, without a doubt, the linear economy has completely dominated the way we mentally see and make sense of the world, as it has been an accepted facet of our lives since day #1. Which is why an alternative has never really been considered, either.

Walter R. Stahel

Our mental infrastructure is determined by culture and religion, education, experience and incentives

Politicians are acting in 4-year cycles until the next elections, a timeline incompatible with a vision. Corporate leaders have a short shelf-life of about 3 years, industrial companies of about 40 years. Keynes said that in the longer term we are all dead. Linear and short-termism go hand-in-hand.

Humankind's linear thinking may prevent our mental infrastructure to distinguish between Nature's circularity which remains steady – the water cycle, the tides, the seasons, fauna and flora – and anthropogenic interference like greenhouse gas emissions causing irreversible changes to the global climate. Humankind's drive to permanently grow and improve based on science and short-term linear technical progress, witness plastic and fossil fuels, clashes with Nature's development by evolution through selection. A different societal development following the Native Americans' motto 'In all your endeavors consider the impact on the next seven generations' could bring our linear thinking more in line with Nature.



1. Dignified livelihoods - Damabhai & Balabhai Marwada, continuing dying craft of kharad carpet weaving, Khavda, Kachchh. Photo: Ashish Kothari

1

For change to happen, who needs to educate our political and corporate leaders, and on what? Or is it the consumers who need to change first?

Ashish Kothari:

The most effective strategy to challenge the linear mindset is to enable the mobilization of marginalized peoples, communities and individuals who have been negatively impacted or 'left behind' by the dominant 'development' model, and who can powerfully resist it; secondly, by enabling communities and people who are demonstrating alternative approaches that meet human needs and aspirations without causing the kind of ecological damage, inequality, and deprivation that such development engenders.

Exposing the power and profit games behind the currently dominant production system (capitalist or statist), has to be part of this. So too, exposing the underlying structures and relations of patriarchy, racism, casteism; and human-centeredness vis-à-vis the rest of nature.

Doryn Negesa:

A systematic change has to happen. Firstly, a change in the education system where the students are taught and prepared to solve problems that may occur in the circular economy model. Secondly, established researchers and experts in circular economy can educate the political and corporate leaders on the importance of the circular economy. Of course, all countries have different priorities in terms of development so they each have to tackle this according to the situation of the country. For example, in Uganda, we have a group of climate leaders that educate the communities through different initiatives like doing clean-ups and plastic waste audits. They believe that to enact a change, they must use their voices as weapons towards advancing the fight against not only climate change, but also the 'take- make–dispose' mentality. This is how change starts, with small steps in the right direction.

"If we could solely rely on the individuals of this world to shape a brighter future, we wouldn't still be utilizing Styrofoam to keep our $1 coffee hot..."

Kyle Ritchie:

It is important to acknowledge a pretty simple truth: we cannot rely on individuals to make the 'right' purchasing practices and change their buying behavior without a proper incentive in place. This isn't to say humans are inherently bad and selfish; I'm simply saying if we could solely rely on the individuals of this world to shape a brighter future, we wouldn't still be utilizing Styrofoam to keep our $1 coffee hot, despite knowing how detrimental it is as a material. From that platform of understanding then, we can accept that the structures of our society must change to incentivize individuals to make better decisions and support the circular management of products and materials. Only political and corporate leaders hold the potential to adjust the transition from linear to circular by providing incentives to the individual.

Walter R. Stahel

For change to happen, society needs a vision of the future as well as safety barriers on the road to the future, such as the 7th Generation Principle. In the past, science often provided visions, religions the safety barriers. But today religion has often lost its clout, and the belief in scientists and science is dwindling or under heavy attack from fake news and conspiracy theories.

For change to happen, it needs to be rooted in local culture. The objective of zero-waste motivates Japanese managers because waste is inefficiency; US managers, however, respond to money and can best be motivated by the objective of 100% yield, high profits, bonuses and efficiency.

For durable consumer goods, the owner-users of objects have always been in command; they determine the service-life of their belongings. For change to happen, education and motivation to turn consumers into users developing 'teddy bear' relationships with objects is a potential avenue.



2

Why is the predominant ‘reduce-reuse-recycle’ narrative towards a circular economy not enough? Or is it?

Ashish Kothari:

While changes in consumer behavior are a crucial part of the solution, especially in the case of elite/rich consumers, this will not by itself be enough. Systems of production, trade and exchange, ownership, and the ideologies underlying them, have to be transformed.

The ‘reduce-reuse-recycle’ or ‘circular economy’ kind of narratives do not necessarily challenge the structures of inequality and unsustainability as listed above, and indeed mega-corporations and powerful states can all claim to be doing RRR. These narratives are easily co-opted by these structures. More systemic transformations are needed.

Doryn Negesa:

The ‘reduce-reuse-recycle’ narrative is indeed not enough. To a achieve a regenerative system, we have to design out waste and pollution, keep products and materials in use, and regenerate natural systems by returning nutrients to the soil to regenerate agriculture leading to enhancement of natural systems.

Kyle Ritchie:

The ‘reduce-reuse-recycle’ narrative has certainly been a beneficial mantra to etch into the minds of many as a mainstream concept, but these steps alone don’t fully address the full scope of efforts required to institute a circular economy. So what’s missing? In order of priority:

1. Refuse: Do not purchase products from companies that do not support a transition to circular via their own material and/or product lifecycles.

2. Rethink: Consider how products’ designs can be improved to incentivize the transition from linear to circular.

3. Repair: Give users the opportunity to affordably (and most importantly conveniently) repair their broken products, rather than throw them away and buy new.

4. Refurbish: Multiple functional elements from multiple faulty products can be merged to form a functional ‘like-new’ product. Refurbishing products, instead of discarding them as waste maintains the value of the elements that are still functional.

5. Repurpose: Upcycle or downcycle materials at the end of their useful life to maintain the energy and value embodied within them.

6. Recover: Trillions of dollars’ worth of materials are sitting in landfills and floating in the oceans around the world. Remediation can act as a form of material recovery.

Is there hope to be had? What kind of “good systemic change” is already underway? Who does it, and how can it be replicated?

Ashish Kothari:

Across the world communities and collectives have come up with a range of positive responses to the crises, alternatives to ‘development’ that are either part of ancient systems of living in harmony with the earth, or new innovations including from within industrialized, western societies. But it is the Global South - not its governments, but its people! - that is taking a lead in integrating ecological wisdom and resilience with economic democracy and social justice, building on traditions of working within and with nature, sophisticated knowledge systems that go back a few millennia, and community ways of doing things – complementing these with the best of what is emerging from new technologies or ideologies.

2. Traditional knowledge into the future - Dalit farmer Nadimidoddi Vinodamma with millets, southern India. Photo: Ashish Kothari

These alternatives range from practices like agroecology (itself extremely diverse), water/food/energy sovereignty using decentralized approaches, direct or radical democracy, sustainable settlements, struggles for equality of genders, sexualities, identities, movements for consumer rights, to the re-assertion of ancient worldviews like *sumac kawsay, buen vivir, ubuntu, swaraj* and the emergence of new ones like ecofeminism, degrowth, and conviviality. In India some of us are promoting the idea of eco-swaraj, or radical ecological democracy, which entails such fundamental transformations.

Doryn Negesa:

There is hope as we can see the concepts working in different countries. Take China for example. they, along with Japan, are the pioneers of circular economy in Asia. China, in order to tackle issues of supply security of primary resources and the related environmental impact of rising material demand, implemented policies through its reform plans (the circular economy promotion law by the national people’s congress of China, 2008). The adoption of this promotion law made China a frontrunner in circular economy legislation. They have transformed industrial parks to become eco-industrial parks that embed reduce, reuse and recycle into the whole production processes, they have developed the recycling industry and most importantly, there is a green consumption to guide citizens towards healthy consumption. It is not so easy to replicate their model as different countries have different bodies of authority but some of the policies and plans can be emulated.

Kyle Ritchie:

There is always urgency tied to minimizing anthropogenic climate change. Some of the Climate Action Initiatives outlined by United Nations Framework Convention on Climate Change (UNFCCC) –‘Momentum For Change,’

“A vast number of people still remain convinced that they need ‘development’…”

‘Climate Neutral Now,’ and ‘Race to Zero’ – in addition to the overarching message from the world’s scientific community that globally, we must limit global warming to well below 2°C, preferably to 1.5°C to avoid catastrophe, all suggest urgency. While it often seems hopeless, I do not believe it is as I continue to see promising developments taking place around the world, focusing on making the circular economy an engrained structure of human life. My new book, *Circular Economy for Dummies*, features some institutions that are making a massive impact.

Walter R. Stahel

Circular Economy is regional and cultural, many environmental problems are global. In the North, societies of abundance need to reduce consumption by a factor of 10 (90%), to enable industrializing countries in The South to build their asset base of infrastructure in education and health, telecommunication and transport, necessary to fulfil basic needs.

Systemic change is underway: In circular societies of the northern hemisphere, hundreds of repair cafés in Europe bring together broken objects with retired craftsmen. The concept of intelligent decentralization in food production and through robots and 3D printing in industrial applications is rapidly progressing.

Universities worldwide develop ‘circular sciences,’ such as reusable polymers and metal alloys, and applications of circular energy in the form of green hydrogen burnt in fuel cells for mobility and heating applications. Used in Japan for over 20 years, circular energy is now also put into practice in Europe.

Nevertheless, challenges remain: How can societies move from a circular economy of scarcity to one of abundance without going through consumer society in less developed regions? How can the electro-mechanical knowledge and skill base necessary to repair and maintain existing assets be preserved in industrialized countries? How can politicians be convinced to support a circular industrial economy respecting the limits of nature’s regeneration and absorption capacity? How can policymakers ‘give waste a value’ and legislate a full producer liability internalizing all life-cycle costs? ●

The four complete interviews are available at www.revolve.media/circular

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