

Seeds of change

A guide for philanthropists and changemakers to protect biodiversity and all life on land.



Contents

How to navigate this guide

These sections will help you decide how to get involved in protecting our planet and all life on land.

Understanding the challenges

An overview of the issues facing life on land.

Getting started

How to start your philanthropy journey.

Taking action

Solutions and real-life examples, including case studies and interviews with experts and changemakers.

Looking beyond philanthropy:

Ways to make a bigger impact, for example, by investing in innovative financing solutions.

Collaborating effectively: Tips on working together to change global systems for the better.

Published on March 21, 2021 to mark the International Day of Forests

Authors:
Jean-Damien Bogner, Stefanie Fehr, Marianne Leborne, Megan Morrow, Grégoire Muhr, Antonia Sariyska, Hannah Wood, Sietse Wouters

UBS reviewers:
Lena Dente, Wayne Gordon, Rudi Henley, Julia Molke, Judy Spalthoff

Design and illustration:
Ewa Grajek, Krzysztof Krowicki, Michał Małolepszy, Mateusz Masiczak, Adam Sadowski

Editor:
Steve Tilling

Contact: sh-philanthropy@ubs.com

1. Understanding the challenges	9
1.1. Demographic pressure	10
1.2. Climate change	12
1.3. Changes in land use and cover	14
1.4. Agricultural production	15
1.5. Deforestation	17
1.6. Pollution	19
1.7. Desertification	22
1.8. Biodiversity loss	24
2. Getting started	30
2.1. Ten tips to start your philanthropic journey	34
2.2. Expert tips for philanthropists	36
3. Taking action	40
3.1. How to end deforestation and restore degraded forests	41
3.2. How to support nature reserves	46
3.3. How to fight poaching and wildlife trafficking	50
3.4. How to respond to climate change	54
3.5. How to restore degraded land and prevent desertification	58
3.6. How to encourage governments to consider biodiversity in new policies	62
3.7. How to prevent the introduction of invasive alien species	64
3.8. How to support sustainable food and fiber production and their supply chains	66
3.9. How to support environmental education and research	70
3.10. How to raise awareness	72
4. Looking beyond traditional philanthropy	75
4.1. Innovative financing solutions	76
4.2. Investing for good	84
5. Working together	93
6. Where next?	101

Foreword

United Nations Sustainable Development Goal 15:

Life on land

Protect, restore and promote sustainable use of terrestrial ecosystems; manage forests sustainably; combat desertification; halt and reverse land degradation; and halt biodiversity loss.



Life on land and the Sustainable Development Goals

In 2015, the United Nations adopted 17 Sustainable Development Goals (SDGs). The goals aim to inspire everyone to achieve a better and more sustainable future for all.³

SDG 15 – Life on land focuses on nature and biodiversity. It calls on the world to manage forests sustainably, combat desertification, end land degradation and reverse biodiversity loss.⁴

By helping the world achieve SDG 15, you'll also be supporting other important SDGs. For example, protecting biodiversity will help prevent pandemics, promote good health and wellbeing (SDG 3), and encourage sustainable economic growth (SDG 8). By fighting air pollution, you'll also reduce health risks (SDG 3) and address climate change (SDG 13).

Nature is critical to all life on earth. But it's under increasing threat. More than ever, we must work together to protect the planet and its biodiversity from climate change and human harm. Because doing nothing risks everything: our health, food, water, livelihoods and economies. In short, our very lives depend on it.

The COVID-19 pandemic proved that our actions have consequences. Indeed, studies revealed a link between land use and the risk of spreading disease.¹ But hope is not lost. Because nature can recover when given space and time. So let's give it just that – and together, we'll bring our planet back from the brink.

Like Sea beyond the Blue – our guide on saving the world's oceans – this guide is a call to action. It provides the answers you need to make a difference and help the world achieve the United Nations Sustainable Development Goal 15: Life on land.²

Individuals, families, entrepreneurs, philanthropists and investors – whoever and wherever you are, everyone can change the world for the better. You can maximize your efforts in many ways. You might decide to give, invest or blend the two. You might decide to act independently or harness the power of working collectively. Whichever way you choose to go, this guide will provide the tools you need to reach your goals.

We look forward to joining you on this journey. The issues we're addressing affect everyone. It's time to start protecting all life on land – not just for ourselves, but for generations to come.

Your UBS Philanthropy Services team.

¹ Gibb, R., Redding, D.W., Chin, K.Q. et al. (2020). Zoonotic host diversity increases in human-dominated ecosystems. *Nature* 584, 398–402. <https://doi.org/10.1038/s41586-020-2562-8>

² The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. Source: United Nations Development Program (n.d.) Sustainable development goals. Retrieved from <https://www.undp.org/content/undp/en/home/sustainable-development-goals.html>

³ United Nations. (n.d.) About the Sustainable Development Goals. Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

⁴ Ibid.

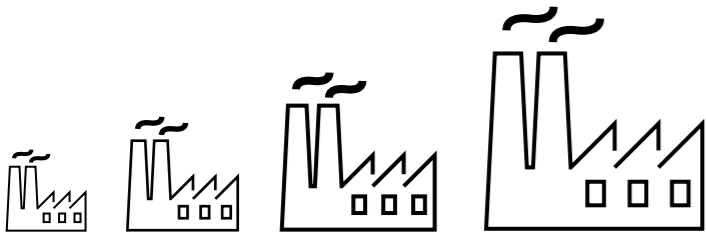
At a glance

Our planet is in crisis. In the last 50 years...

2x



the world's population has **doubled**



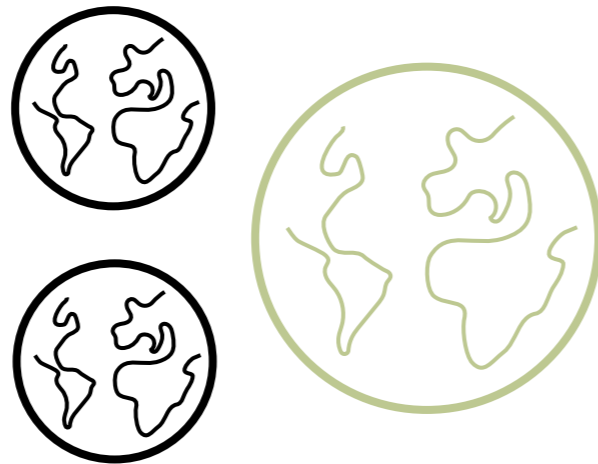
the global economy has **quadrupled**

10x



international trade has **multiplied by ten⁵**

We consume and waste more than ever.



We use **1.75** planets' worth of resources. At this rate, we will need **three planets by 2050**. But we only have **one**.⁶

And nature is paying the price.

2,000,000,000



Two billion hectares of land are now degraded – the very land that over 3 billion people rely on for food, water and jobs.⁸

1M



One million plant and animal species have been threatened by extinction.¹⁰



Wildlife populations have fallen **by more than 60%**.⁹

80%



In each of the past five years, 10 million hectares of forest – home to **80% of land-based species** and jobs for over 1.6 billion people – were destroyed.⁷

Why? The reasons include:



Climate change due to our human activities



Change of land use, mostly for agriculture and urbanization



Habitat loss due to deforestation and change of land use



Desertification and land degradation

What are the solutions?

⁵ IPBES. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.

⁶ The world counts. (n.d.). Number of planet Earths we need. Retrieved from <https://www.theworldcounts.com/challenges/planet-earth/state-of-the-planet/overuse-of-resources-on-earth/story>

⁷ United Nations. (2020). Forests: Description. Retrieved from <https://sdgs.un.org/topics/forests>

⁸ IPBES. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. <https://ipbes.net/global-assessment>

⁹ WWF. (2018). Living Planet Report - 2018: Aiming Higher. Grooten, M. and Almond, R.E.A.(Eds). WWF, Gland, Switzerland.

¹⁰ IPBES. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.



Protecting and restoring forests

- Supporting programs that protect forested areas; reduce the need for deforestation; and restore and reforest cleared land.
- Encouraging governments worldwide to introduce and enforce robust regulations; reduce budgets and subsidies for companies harming the environment; redirect money to sustainable businesses; and use science-backed approaches to restore deforested land.



Collaborating in collectives

- Joining an existing collective to combine funds and resources, rollout proven solutions, and increase impact.
- Starting a new collective to tackle an issue that's not currently represented.



Encouraging governments to consider biodiversity in new policies

- Putting biodiversity at the top of political agendas by raising awareness; working with key stakeholders like environmentalists or conservationists; helping communities speak out about environmental harm and abuses; and exposing the damage of biodiversity loss through the media.
- Encouraging economists, conservationists and policy-makers to collaborate on new science-backed policies.
- Creating the right conditions for change by establishing appropriate goals; bridging biodiversity policies with other policies; liaising with those implementing the policies; and encouraging ministers to drive progress.



Supporting sustainable agriculture, food production and supply chains

- Investing in and collaborating with initiatives that promote sustainable and smart farming in developing countries.
- Raising awareness about the problem of unsustainable agriculture, and food loss and waste.
- Backing organizations that help companies establish sustainable supply chains, and support sustainable food producers.



Fighting poaching and wildlife trafficking

- Funding the resources needed to end the trade globally.
- Launching new public-private partnerships to tackle the issue.
- Collaborating with organizations already fighting the illegal wildlife trade.
- Advocating the cause nationally and globally.



Preventing the introduction of invasive alien species¹¹

- Supporting programs that prevent foreign species entering countries.
- Partnering with conservation organizations involved in removal programs and restoring islands.



Supporting nature reserves

- Unlocking new income streams, for example, ecotourism (tourism that enables people to experience nature without damaging or disturbing it).
- Using debt-for-nature swaps (freeing governments from debt to spend more on conservation).



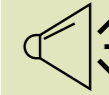
Responding to climate change

- Lobbying regional and national governments to adopt sustainable agricultural practices.
- Supporting programs that protect and restore natural carbon stores, and reduce emissions.
- Changing behaviors to reduce CO₂ emissions, for example, eating less meat and flying less.
- Establishing or supporting philanthropic foundations to prove new markets and businesses are viable; fund new projects; simplify grant processes; and connect with other foundations for greater impact.



Raising awareness

- Using science-based facts to remain credible and avoid spreading false messages.
- Financing a media strategy across various formats, such as a documentary, cartoon, social media campaign or publication.
- Funding programs for children to help them connect with nature, particularly as part of school curriculums.



Promoting environmental education and research

- Supporting scientists and funding research.
- Bringing environmental science into school curriculums.
- Educating decision-makers and policymakers.



Using innovative investments

- Investing in blended finance solutions (investments that mix philanthropic funds with development finance). Blended finance solutions attract commercial capital for sustainable projects, while potentially providing returns for investors.
- Investing in multilateral development bank (MDB) bonds that aim to conserve biodiversity.
- Investing in sustainable investments, which aim to provide returns comparable to traditional investments, while putting money to work for good.

¹¹ Invasive Alien Species (IAS) are animals and plants that are introduced accidentally or deliberately into a natural environment where they are not normally found, with serious negative consequences for their new environment. Source: European Commission. (2020). Invasive Alien Species. Retrieved from https://ec.europa.eu/environment/nature/invasivealien/index_en.htm



Photo: Gary Morrisroe

Sir David Attenborough,
Vice President, Fauna & Flora
International, UK

“We are living in a changing world.

Our natural world is in peril. The consequences of this unfolding disaster will affect us all. As biodiversity declines, so ecosystems begin to unravel and with them we stand to lose the valuable services that nature provides: clean air and water, medicines, food, storm protection, climate and weather regulation – the list goes on.

The case for saving biodiversity has never been stronger, clearer or more pressing.”

01 Understanding the challenges

In this section, we address some of the biggest challenges threatening life on land. And these challenges are linked. For example, many human activities are accelerating climate change and increasing weather extremes. Additionally, the resource needs of a growing global population is driving land use change for agriculture and urbanization. This typically leads to deforestation, pollution, desertification and habitat loss. Ultimately, all of this affects biodiversity and life on our planet.

To act effectively, it's vital we understand the root cause of the issues.

01.1 Demographic pressure

10 bn



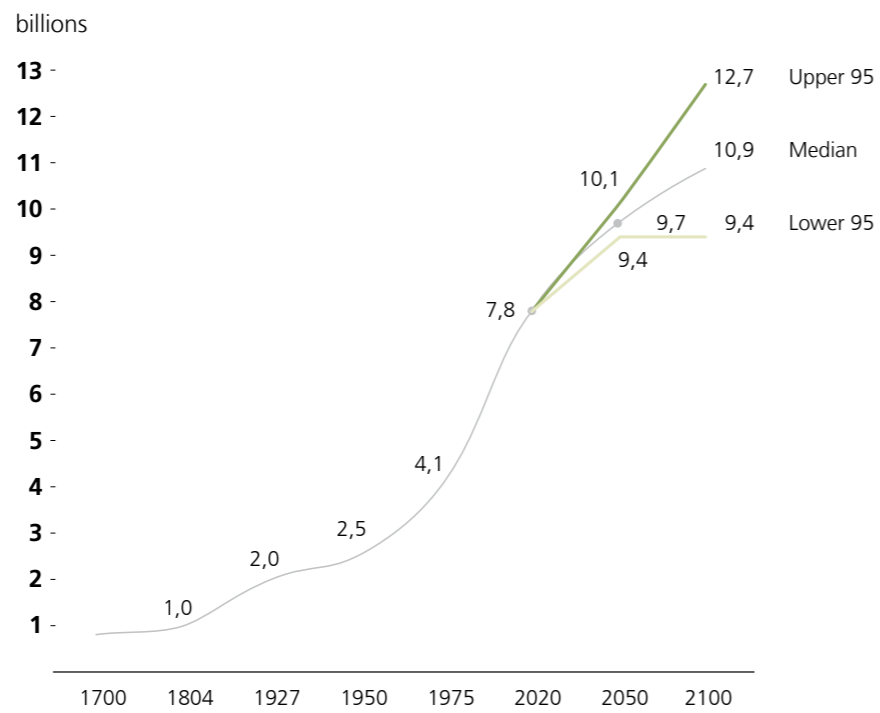
In the last 50 years, the global population has doubled, and is expected to reach 10 billion by 2050.¹²

Population growth has a major impact on our planet's health. Throughout history, the global human population has grown gradually. But this growth is accelerating, due to advances in areas such as agriculture and healthcare. In the last 50 years, the population has doubled, and is expected to reach 10 billion by 2050.¹³

Like any species, we take resources from our surroundings to satisfy our needs. In the last 50 years, the global economy has quadrupled, and global trade has multiplied by ten. The result? We consume and waste more than ever. This puts pressure on our planet's resources, particularly in high-income countries.¹⁴

Data since 1961 shows that global population growth, combined with people consuming more, has accelerated human use of land and freshwater. Today, agriculture uses around 70% of global freshwater. Areas are also increasingly used for agriculture and forestry, and productivity has increased. This has led to increasing greenhouse gas emissions, lost natural ecosystems such as forests and wetlands, and declining biodiversity.¹⁵

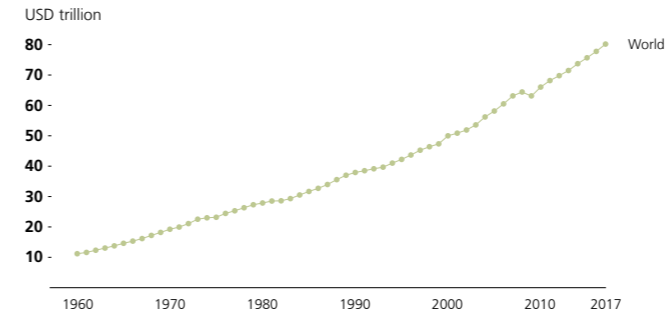
World population



Source: Adapted from United Nations. World Population Prospects 2019.

Gross Domestic Product, 1960 to 2017

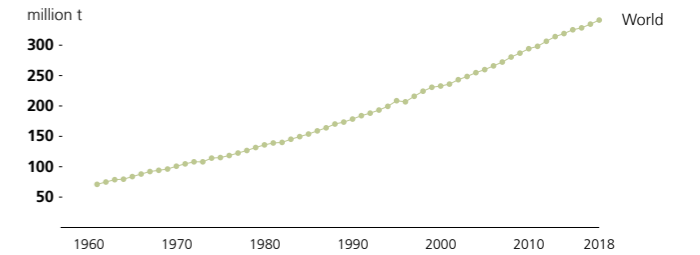
Gross domestic product adjusted for price changes over time (inflation) and expressed in US dollars.



Source: World Bank. (n.d.).

Meat production, 1961 to 2018

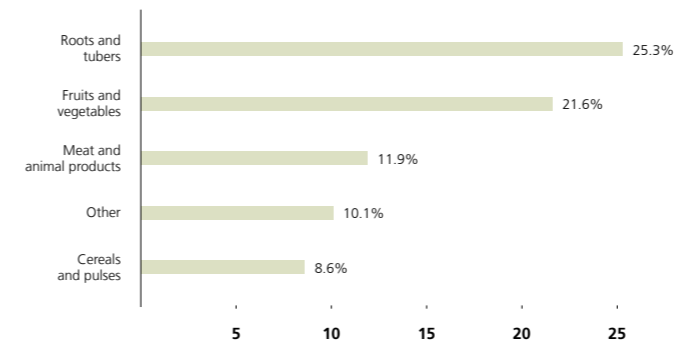
Meat includes cattle, poultry, sheep / mutton, goat, pigmeat, and wild game.



Source: UN Food and Agricultural Organization (FAO). Note: Figures are given in terms of dressed carcass weight, excluding offal and slaughter fats.

Share of food lost in post-harvest processes

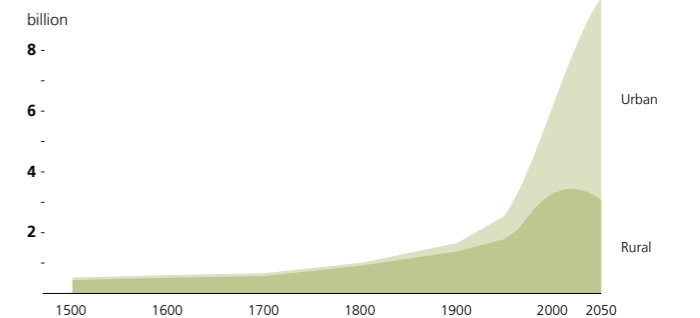
Post-harvest losses are measured as the food lost from the farm level up to, but not including, the retail level. This includes handling and storage, food processing, transport and distribution. It does not include consumer waste.



Source: UN Food and Agriculture Organization (FAO). Note: An economic weight is used to aggregate percentages at regional or commodity group levels, so that higher-value commodities carry more weight in loss estimation than lower-value ones.

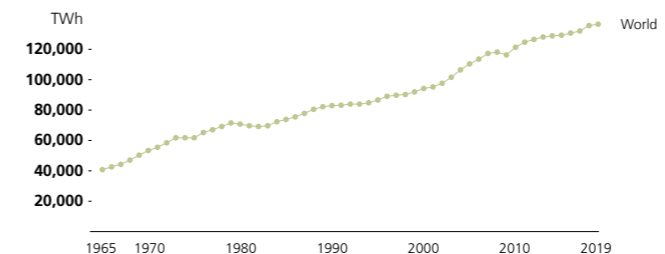
Urban and rural population projected to 2050

Total urban and rural population, given as estimates to 2016, and UN projections to 2050. Projections are based on the UN World Urbanization Prospects and its median fertility scenario.



Source: OVID based on UN World Urbanization Prospects 2018 and historical sources.

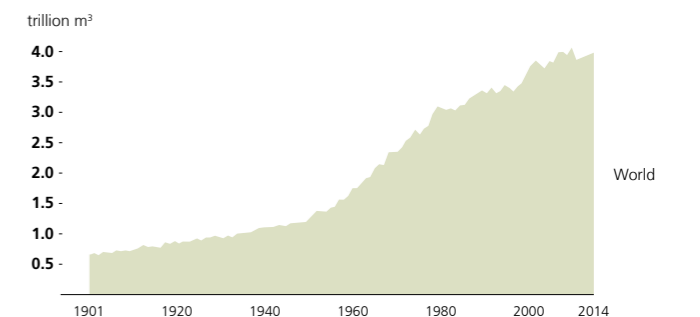
Fossil fuel consumption



Source: Our World in Data based on BP Statistical Review of World Energy

Global freshwater use over the long run

Global freshwater withdrawals for agriculture, industry and domestic uses since 1900, measured in cubic metres (m³) per year.



Source: Global International Geosphere-Biosphere Programme (IGBP).

¹² IPBES. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ IPCC. (2019). Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson

01.2 Climate change

50%



The world's wealthiest 1% account for more than twice the combined carbon emissions of the poorest 50%. But this group also has the financial means to make the biggest difference.¹⁶

Did you know?

A temperature drop of less than two degrees was enough to trigger the "Little Ice Age" in Europe.¹⁹ And 20,000 years ago, a five-degree drop buried much of the North American continent under ice.²⁰

What is climate change?

Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional and global climates.¹⁷ The global temperature has fluctuated over thousands of years. But the climate is now changing more significantly and rapidly than ever. Temperatures are currently the highest they have been for many years without a break. This indicates a rapid rise of around 1.02°C above average for much of 2020.¹⁸

One or two degrees centigrade may not sound like much. But it's a huge difference when you're talking about heating up a planet. Raising the Earth's temperature by just one degree requires a massive amount of heat.

Scientists believe that human activities – such as burning fossil fuels, and clearing land for agriculture and industry – are largely driving this unprecedented rise in global temperatures. Human activities contribute to the "greenhouse effect", which involves gases like CO₂ and methane building up in the atmosphere and trapping heat.²¹ A natural greenhouse effect is a good thing. Without it, the planet would be a frozen wasteland, unable to support life.²² But it's now in overdrive, with excess gases in the atmosphere trapping more heat than ever.

How is climate change affecting the planet?

We're seeing more frequent extreme weather events, such as heatwaves, storms, droughts and floods. Rainfall patterns are also changing, making wet regions wetter and dry regions drier. Sea levels are rising too, due to melting glaciers and increasing ocean temperatures.²³ This affects everyone and everything on the planet, from altering the geographical locations of plants and animals, to interfering with animal migration patterns and changing seasonal activities.



Jess Ayers,
Director Climate Change, Children's
Investment Fund Foundation, UK

"If you protect and invest in nature, you unlock multiple challenges. The destruction of nature is responsible for almost as many greenhouse gas emissions as China. It also drives biodiversity loss; creates abuses of livelihoods and human rights; and results in more zoonotic diseases (diseases that jump from animals to humans).

On the flip side, investing in systems that protect and restore nature is good for everyone and everything: the climate, health, biodiversity, society, and the next generation."

¹⁶ UNEP. (2020). Emissions Gap Report 2020. Nairobi. Retrieved from <https://www.unep.org/emissions-gap-report-2020>

¹⁷ NASA. (2019). Overview: Weather, Global Warming and Climate Change. Retrieved from <https://climate.nasa.gov/resources/global-warming-vs-climate-change>

¹⁸ NOAA. (2020). September 2020: Another Record-Setting Month for Global Heat. Retrieved from <https://www.climate.gov/news-features/features/september-2020-another-record-setting-month-global-heat>

¹⁹ NASA. (n.d.). NASA GISS: Science Briefs: Glaciers, Old Masters, and Galileo. Retrieved from https://www.giss.nasa.gov/research/briefs/shindell_06

²⁰ NASA. (n.d.). World of Change: Global Temperatures. Retrieved from <https://earthobservatory.nasa.gov/world-of-change/global-temperatures>

²¹ Ibid.

²² NRDC. (2019). Greenhouse Effect 101. Retrieved from <https://www.nrdc.org/stories/greenhouse-effect-101>

²³ IPCC. (2012). Changes in Climate Extremes and their Impacts on the Natural Physical Environment. Retrieved from https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap3_FINAL-1.pdf

01.3 Changes in land use and cover

Harmful changes to land use and cover are happening more quickly and substantially than ever before. These changes are the biggest cause of biodiversity loss.²⁴

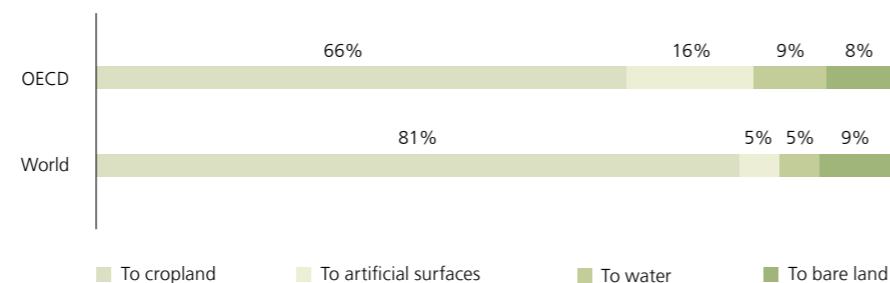
One of the best ways to record the pressures of human activity on ecosystems and biodiversity is to monitor the changes.²⁵ To implement the right solutions, it's important to understand what's driving the changes.

More than 80% of registered land use changes arise from humans converting natural forests, shrublands and grasslands for crops and forestry. For monocultures (growing just one crop, plant or type of livestock), losing natural vegetation destroys habitats and harms wildlife.

Additionally, unsustainable agricultural practices drain resources from soil, eventually causing desertification (where previously fertile land becomes barren). These activities, plus destructive practices like mining, account for almost 10% of global land use change.

Urbanization (populations moving from rural to urban areas) and constructed artificial

Loss of natural and semi-natural vegetated land by cover type, 1992 to 2015²⁶



Source: Butler, R. A. (2020). Brazil's forests.

surfaces account for only 5% of global land use changes. But they seriously harm biodiversity. For example, building a highway in the middle of a forest can encourage illegal logging and hunting. It also fragments wildlife habitats and limits animals' movements. This is a particularly serious issue for large predators which typically require a large, undivided habitat.

01.4 Agricultural production

Did you know?

Chocolate is derived from a plant susceptible to the damaging practice of "monocropping" (growing a single crop). Cocoa trees grow naturally beneath the canopies of larger trees. But to increase yields, some growers have switched to monocropping. Because this involves cutting down larger trees, local biodiversity suffers and cocoa is more vulnerable to extreme weather. Based on current climate projections, the cocoa growing region in Western Africa is at risk.²⁷

Global agricultural production increased 240% between 1961 and 2017.²⁷ It is no small feat to keep pace with the demands of a growing population. In some cases, maximizing productivity and profitability means cutting corners.

In 2015, countries in the Organisation for Economic Co-operation and Development (OECD) paid around 100 billion US dollars to tackle agricultural practices that harm the environment.²⁸ This harm can take many forms, including deforestation and unsustainable irrigation practices.

Climate change has made environments less suitable for growing commodities like cocoa. While extreme weather is a threat in itself, it changes how we use and manage land and affects where plants and animals can live. It has also made some environments attractive to unwelcome plant and animal species.³⁰ These species can steal resources, damage environments and even carry viruses. Undesirable plants and insects are also increasingly resistant to chemical control agents. Because of this, the agricultural sector is encouraged to control pests holistically.³¹

How agriculture contributes to climate change

In 2017 alone, agriculture contributed around 12% to total global emissions³² through factors such as fertilizers, land use changes like deforestation, and methane produced by animals such as cattle.³³

²⁴ OECD. (2018). Monitoring land cover change. Retrieved from <https://www.oecd.org/env/indicators-modelling-outlooks/monitoring-land-cover-change.htm>

²⁵ Ibid.

²⁶ OECD stands for Organisation for Economic Co-operation and Development and include 37 countries: Australia, Austria, Belgium, Canada, Chile, Colombia, Check Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States

²⁷ IPCC. (2019). Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Retrieved from <https://www.ipcc.ch/srcc/>

²⁸ IPBES. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. <https://ipbes.net/global-assessment>

²⁹ Läderach, P., Martinez-Valle, A., Schroth, G., and Castro, N. (2013). Predicting the future climatic suitability for cocoa farming of the world's leading producer countries, Ghana and Côte d'Ivoire. *Climatic Change*, 119(3-4), 841-854. doi:10.1007/s10584-013-0774-8

³⁰ Lehmann, P., Ammunét, T., Barton, M., et al. (2020). Complex responses of global insect pests to climate warming. *Frontiers in Ecology and the Environment*, 18 (3), 141-150. <https://doi.org/10.1002/fee.2160>

³¹ Walthall, C.L., Hatfield, J., Backlund, P, et al. (2012). Climate Change and Agriculture in the United States: Effects and Adaptation. USDA Technical Bulletin 1935. Washington, DC. 186 pages

³² FAO. (n.d.). Emissions shares. Retrieved from <http://www.fao.org/faostat/en/#data/EM/visualize>

³³ Bellarby, J., Foeroid, B., Hastings, A., and Smith, P. (2008). Cool farming: Climate impacts of agriculture and mitigation potential. Amsterdam, the Netherlands: Greenpeace International.

01.5 Deforestation



Want to know more about mangroves? Check out our guide, [Sea beyond the Blue](#)⁴⁰

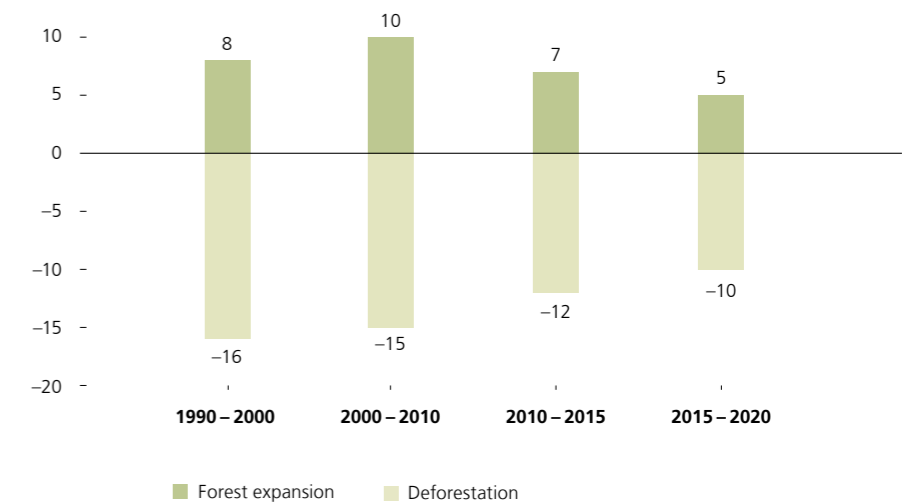
Forests cover around a third of the world's land. They are home to almost 75% of mammal, bird and amphibian species, and around 60% of all plants.³⁴ Tropical forests are biodiversity hotspots and can host 650 tree species per hectare – more than in the whole of Canada and the continental US.³⁵

Half the world's primary forests have been cut down in the last 75 years.³⁶ In the last five years alone, around 10 million hectares of forest were cleared per year.³⁷ This figure was close to 12 million hectares in 2019 – a third of which was in tropical primary forests.

That equates to losing an American football-pitch-sized area of forest every six seconds.³⁸

Global forest expansion and deforestation, 1990 – 2020

Million hectares per year



Source: Food and Agriculture Organization (FAO). (2020).

It's estimated that deforestation causes around 10% of all global CO₂ emissions, which is more than the whole European Union³⁹. Deforestation also increases human interactions with wildlife that are prone to transmitting pathogens.

Strategies to reduce deforestation and restore forests and mangroves are vital for achieving climate targets.

Agriculture and biodiversity – a fragile relationship

Evan Axelrad,
Manager Business Development,
One Acre Fund, Kenya

“How can agriculture fight biodiversity loss?”

Making existing farmland more productive can help reverse biodiversity loss. For example, One Acre Fund's “sustainable intensification” gives African smallholder farmers tools to dramatically improve yields on existing plots, rather than clearing new land. It makes soil more fertile and maximizes productivity on even the smallest farms through a blend of organic methods and, where appropriate, carefully applied inorganic approaches. This balanced approach is well-suited to improving food security in Africa – the world's hungriest region – while helping prevent land being converted to agriculture.

Is it possible to support agriculture while protecting biodiversity?

Yes, because they're so closely linked. Biodiversity is vital for healthy soils and other resources farmers rely on. Helping farmers diversify their crops and learn new conservation practices can protect their lands and livelihoods for generations.”

³⁴ FAO and UNEP. (2020). The State of the World's Forests 2020. Forests, biodiversity and people. Rome. <https://doi.org/10.4060/ca8642en>
³⁵ Rath, A., Ollerton, J., Colley, P. (2014). Why one hectare of rainforest grows more tree species than US and Canada combined. Retrieved from <https://theconversation.com/why-one-hectare-of-rainforest-grows-more-tree-species-than-us-and-canada-combined-21728>
³⁶ BBC Bitesize. (n.d.). Deforestation - Biodiversity and the effect of human interaction on ecosystems. Retrieved from <https://www.bbc.co.uk/bitesize/guides/zt8f4qt/revision/4>
³⁷ FAO and UNEP. (2020). The State of the World's Forests 2020. Forests, biodiversity and people. Rome. <https://doi.org/10.4060/ca8642en>
³⁸ Weisse, M., and Goldman, E. D. (2020). We Lost a Football Pitch of Primary Rainforest Every 6 Seconds in 2019. Retrieved from <https://www.wri.org/blog/2020/06/global-tree-cover-loss-data-2019>
³⁹ Gibbs, D., Harris, N., and Seymour, F. (2018). By the Numbers: The Value of Tropical Forests in the Climate Change Equation. Retrieved from <https://www.wri.org/blog/2018/10/numbers-value-tropical-forests-climate-change-equation>
⁴⁰ UBS. (2020). Sea beyond the Blue: a guide on the oceans for philanthropists and changemakers. <https://www.ubs.com/global/en/ubs-society/philanthropy/experiences/beyond-blue.html>

01.6 Pollution

What is pollution?

It's the introduction of harmful substances or products (pollutants) into the environment, which often cause undesirable effects.⁴¹ Pollutants can be natural or man-made. Whatever their source, they harm the air we breathe, the water we drink, the noise levels we hear, the soil we use to grow crops, and the light levels surrounding us. Put simply, pollution seriously harms all life on land.

Air pollution

Air pollution arises from chemical reactions in the atmosphere. While air pollution can come from natural sources, it's mainly caused by human activities, including households, industry, transportation, agriculture and waste.⁴²

Air pollution is considered the greatest environmental health risk of our time. It contributes to strokes, chronic respiratory diseases, lung cancers and heart attacks.⁴³ It also kills around seven million people worldwide every year, affecting low and middle-income countries the most.⁴⁴

Many causes of air pollution also increase greenhouse gas emissions, affecting the Earth's climate and ecosystems.

Water pollution

Water pollution is mainly driven by:

- population demands and urbanization
- linear extractive economies (extracting resources, producing goods, then creating waste)
- poor waste management
- inadequate regulations and law enforcement.

There are many consequences of water pollution, with polluted rivers reaching the ocean and harming ecosystems. For example, microplastics slow down CO₂ sequestration (removing CO₂ from the atmosphere), harm biodiversity and jeopardize food resources. Plastic remains in ecosystems for years, harming thousands of sea creatures every day.⁴⁵

Water pollution also jeopardizes human health and wellbeing. For example, it results in untreated wastewater and sewage (which contains millions of bacteria). This can spread disease and contaminate drinking water.⁴⁶



Suzana Padua,
President of the Institute for
Ecological Research (IPE), Brazil

“Today, most people live in big cities, so nature becomes less valued. But we must cherish our planet’s natural richness if we wish to protect it. Brazil has outstanding biodiversity with unique biomes, ecosystems, species and native ethnic cultures. Deforestation and destruction of habitats have caused tremendous losses. IPE works in many ways so conservation and sustainability can occur.”

⁴¹ Dictionary. (n.d.). Definition: Pollution. Retrieved from <https://www.dictionary.com/browse/pollution>

⁴² UNEP. (n.d.). All you need to know about air pollution. Retrieved from <https://www.unep.org/interactive/all-you-need-to-know-air-pollution/>

⁴³ UNEP. (n.d.). Air. Retrieved from <https://www.unenvironment.org/explore-topics/air/about-air>

⁴⁴ World Health Organization. (n.d.). Air pollution. Retrieved from https://www.who.int/health-topics/air-pollution#tab=tab_1

⁴⁵ United Nations. (2017). The Ocean Conference, New York, 5-9 June 2017, Factsheet: Marine Pollution.

⁴⁶ Pipeline. (1996). On-site wastewater disposal and public health from Pipeline by National Small Flows Clearinghouse. Retrieved from <https://engineering.purdue.edu/~frankenb/NU-prowd/disease.htm>



Light and noise pollution

Artificial light harms ecosystems and disrupts the natural cycles dictating sleep and wakefulness, and migratory instincts. The US city of Chicago, for example, generates the greatest amount of light pollution. It's considered the most dangerous city for birds, as it attracts and disorients migratory birds at night, which then crash into buildings. An estimated 600 million birds die from building collisions every year in the United States.⁴⁷

Noise pollution is human-produced sound from road, rail, aircraft, and industry sources. It can damage ecosystems and significantly harm physical and mental health. One in five people are currently exposed to levels considered harmful to health. Long-term exposure to environmental noise is estimated to cause 12,000 premature deaths and contribute to 48,000 new cases of heart disease every year in Europe.⁴⁸

Pollution from coal mining and its impact on biodiversity

Dr. David Neidel,
ELTI Asia Program Advisor, World
Agroforestry Centre, Philippines

“Surface mining destroys local landscapes. It removes all vegetation and soil, and blasts away upper rock layers until the coal seam is reached. Formerly vibrant ecosystems become moonscapes devoid of life. Plus, when underground surfaces are exposed to air, a chemical reaction can produce sulfuric acid, polluting water for neighboring communities and ecosystems downstream.

Mining also generates dust, which causes respiratory problems, and covers plants, preventing them from photosynthesizing (transforming light energy into oxygen and nutrients) normally. Equally damaging environmental impacts occur globally when coal is burnt, releasing carbon dioxide, mercury and other heavy metals into the atmosphere.

Does biodiversity improve when mining operations end?

Unfortunately, mining companies often do a poor job of rehabilitating areas where they've worked. Generally, larger mining companies do better than smaller ones, because they're audited more often and keener to maintain their reputation.

Additionally, authorities typically struggle to monitor mine site rehabilitation for long periods. Doing so would enable them to better assess the quality of the restoration work. Regulations also often lack biodiversity targets, such as the rehabilitation of species.

What advice would you give people who want to get involved?

First, think carefully about how and where you invest your money, to avoid supporting companies with poor practices.

You might fund non-governmental organizations (NGOs) that lobby governments to protect nature; work with communities to resist mining operations; monitor companies' environmental abuses; and support capacity development programs, which help companies rehabilitate mine sites using best practices.”

⁴⁷ Horton, K. G., Nilsson, C., Van Doren, B. M., et al. (2019). Bright lights in the big cities: migratory birds' exposure to artificial light. *Frontiers in Ecology and the Environment*.

⁴⁸ EEA. (2020). *Environmental noise in Europe*.

01.7 Desertification

Did you know?

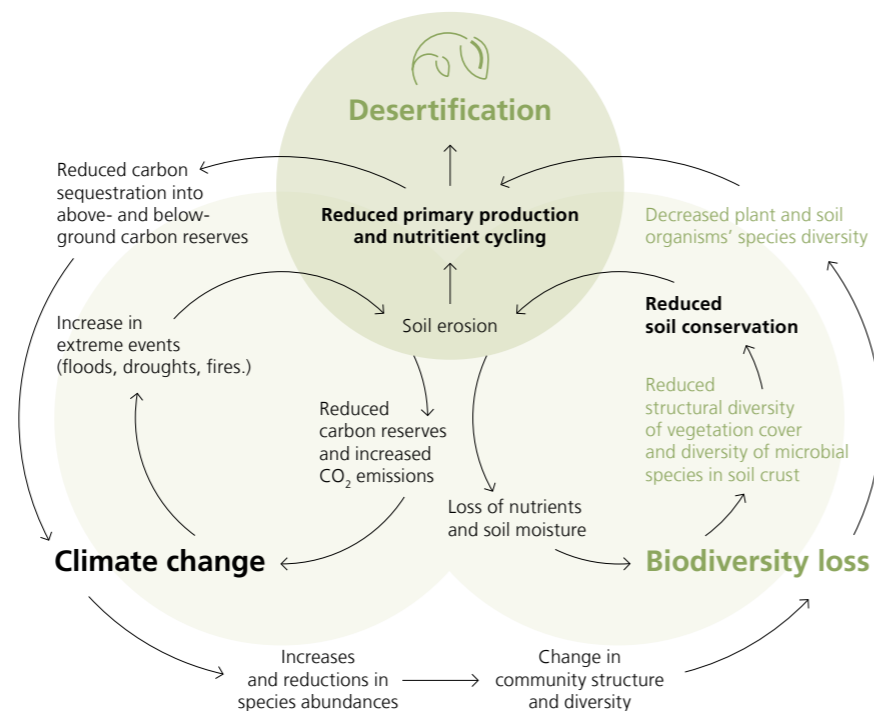
Almost half of EU member states have declared that desertification affects part of their territories. But there's no EU strategy to tackle the problem.⁴⁹

“Desertification” refers to land being persistently degraded. The word might bring sand dunes to mind. But desertification occurs in hot and cold regions. It deprives people of food and fresh water, and currently harms the livelihoods of more than two billion people.⁵⁰

Today, over 40% of the world's land surface is dryland.⁵¹ Every minute, 23 hectares of land are lost to degradation – that's the equivalent of losing land equal to the size of Germany every year.⁵² The damage is accelerating at an estimated 30 to 35 times historical rates, according to the United Nations.⁵³ More than 100 countries are at risk, including some of the poorest and most vulnerable populations.⁵⁴

Unsustainable farming and urbanization are the main causes of desertification. Rising CO₂ emissions from human activities also increase desertification and the risk of drought.⁵⁵ But, one of the biggest causes – agriculture – can also be part of the cure.

How desertification, climate change and biodiversity loss are linked



In green: major components of biodiversity involved in the linkages
Bolded: major services impacted by biodiversity losses

Source: Millennium Ecosystem Assessment. (2005). Ecosystems and Human Well-being: Desertification Synthesis.

Busting the myths

Garo Batmanian,
 Global Lead for Forests, Landscapes, and Biodiversity, World Bank, USA

“What are the myths about desertification?”

Some think desertification refers to deserts expanding into new areas. But it refers to arid, semi-arid and sub-humid lands – collectively known as drylands, including savannas and grasslands – that cover around 46% of the Earth's land. It also refers to how climate change and poor management degrade productive land and ecosystems.

Another myth is that desertification affects relatively few people. In fact, it carries a heavy price tag in terms of lost ecosystem benefits, food production and livelihoods. Drylands are home to three billion people, with around 90% of them living in developing countries – and over 24% of drylands are already degraded.

There's also a myth that fighting desertification only relates to the United Nations' Sustainable Development Goal (SDG) 15 – Life on land. In fact, managing land and resources sustainably, and restoring degraded areas, is fundamental to achieving most SDGs, including SDG 2 (zero hunger), SDG 6 (clean water and sanitation) and SDG 13 (climate action).

How can combating desertification address climate change and biodiversity loss?

Each challenge is closely connected. Rising global temperatures increase desertification, and land degradation increases climate change. In turn, climate change and desertification degrades ecosystems.

Restoring degraded land worldwide would go a long way toward solving the challenges – and all while boosting sustainable development. It removes greenhouse gases, establishes healthy ecosystems, and enables local communities to produce food and secure their livelihoods.”



⁴⁹ Rossi, R. (2020). Desertification and agriculture. Briefing for the European Parliament. February 2020. European Parliamentary Research Service.

⁵⁰ United Nations. (n.d.). Retrieved from https://www.un.org/en/events/desertification_decade/whynow.shtml.

⁵¹ Ibid.

⁵² United Nations. (n.d.). Retrieved from <https://www.un.org/sustainabledevelopment/biodiversity/>

⁵³ United Nations. (n.d.). World Day to combat Desertification and Drought, 17 June. Retrieved from <https://www.un.org/en/observances/desertification-day/background>

⁵⁴ Rossi, R. (2020). Desertification and agriculture. Briefing for the European Parliament. February 2020. European Parliamentary Research Service.

⁵⁵ National Geographic. (2019). Desertification explained, by Christina Nunez. Retrieved from <https://www.nationalgeographic.com/environment/habitats/desertification/>

01.8 Biodiversity loss

30%



A third of the world's plants and species will probably be extinct by 2070.⁶⁰

Wildlife trafficking

The COVID-19 pandemic illustrated that illicit wildlife exploitation not only threatens biodiversity and the environment. It also threatens our health, since three-quarters of all emerging infectious diseases cross from animals to humans.⁶⁴

Wildlife trafficking has reached unprecedented levels in recent years. For example, the illegal ivory trade is estimated to have tripled since 1998.⁶⁵ Illegal logging, fishing and wildlife trade have an estimated value of one trillion US dollars or more per year. And most of the economic losses (more than 90%) come from estimated ecosystem services that are not currently priced by the market.⁶⁶

The trade goes beyond ivory and rhino horn. Between 1999 and 2018, nearly 6,000 species of fauna and flora were seized. Almost every country has played a role in this trade.⁶⁷

Nature is declining globally, harming the world's ecosystem's stability and ability to function. What's more, genetic variability and species varieties are decreasing rapidly. There are many complex reasons for this, some of which are listed below. But the results are always the same: profoundly negative changes for all life on Earth.

- **Loss of habitat:** Humanity is altering natural wildlife habitats through deforestation, destroying wetlands and other activities that thin, fragment and wipe out ecosystems.⁵⁷
- **Invasion of alien species:** Driven by climate change, alien species disrupt ecosystems by reducing or even destroying a native species. This threatens global food security and livelihoods.⁵⁸
- **Overharvesting:** Biodiversity that's removed faster than it can replenish itself reduces some species to very low numbers, and drives others to extinction.⁵⁹
- **Pollution and waste:** Increased pollution in waterways harms water quality, and reduces freshwater and irrigation. Waste in water also harms wildlife and biodiversity, and threatens food supplies.
- **Climate change:** Increasing temperatures harm the habitats of many species. A third of the world's plants and species will probably be extinct by 2070⁶⁰; most polar bears could be lost by 2021,⁶¹ and pandas' bamboo habitat is projected to diminish 35% in the next 80 years.⁶²
- **Pandemics:** Deforestation and the wildlife trade enable pathogen-carrying species like rats and bats to thrive and threaten humans with disease.⁶³



Professor David Macdonald,
Oxford University

“Without biodiversity, there is no future for humanity.”⁵⁶

⁵⁶ Carrington, D. (2018). What is biodiversity and why does it matter to us? Retrieved from <https://www.theguardian.com/news/2018/mar/12/what-is-biodiversity-and-why-does-it-matter-to-us>

⁵⁷ Flora & Fauna International. (2020). Habitat loss: Disappearing World. Retrieved from <https://www.fauna-flora.org/conservation-challenges/habitat-loss>

⁵⁸ IUCN. (2020). Invasive alien species and climate change. Retrieved from <https://www.iucn.org/resources/issues-briefs/invasive-alien-species-and-climate-change>

⁵⁹ The Environmental Literacy Council. (2015). Overexploitation. Retrieved from <https://enviroliteracy.org/>

⁶⁰ Román-Palacios, C., & Wiens, J. J. (2020). Recent responses to climate change reveal the drivers of species extinction and survival Proceedings of the National Academy of Sciences. Feb 2020, 117 (8) 4211-4217; DOI: 10.1073/pnas.1913007117

⁶¹ Molnár, P.K., Bitz, C.M., Holland, M.M., et al. (2020). Fasting season length sets temporal limits for global polar bear persistence. Nature Climate Change. 10, 732-738 (2020). <https://doi.org/10.1038/s41558-020-0818-9>.

⁶² Swaisgood, R., Wang, D. and Wei, F. (2016). Ailuropoda melanoleuca. The IUCN Red List of Threatened Species, 2016. Retrieved from <https://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T712A45033386.en>

⁶³ Nature. (2020). Why deforestation and extinctions make pandemics more likely. Retrieved from <https://www.nature.com/articles/d41586-020-02341-1>

⁶⁴ United Nations Office on Drugs and Crime. (2020). World Wildlife Crime Report 2020.

⁶⁵ Miliken T. (2014). Illegal trade in ivory and rhino horn: an assessment to improve law enforcement.

⁶⁶ World Bank. (2019). Illegal Logging, Fishing, and Wildlife Trade: The Costs and How to Combat it. Washington, DC. P.8.

⁶⁷ United Nations Office on Drugs and Crime. (2020). World Wildlife Crime Report 2020.

A lifetime focusing on biodiversity

Dr. Mark Wright,
Director of Science, World Wide Fund for Nature (WWF), UK

“What’s the most striking fact about biodiversity loss for you?”

For me, it’s a very personal fact. I was born in the early 1960s. In my whole life so far, I’ve never known a time when nature’s richness hasn’t continuously diminished.

What are some of the wider effects of biodiversity loss?

Many argue the case for nature because of the things it provides that we take for granted: clean air, fresh water, fertile soils, pollinators, and the foundation of many medicines we rely on. But, shamefully, we’re also denying future generations of the wonder and inspiration that a vibrant natural world brings.

How has engaging with philanthropists helped your work?

At WWF, philanthropists have played a key role investing in exploratory and potentially high-impact work, such as piloting seagrass restoration in the UK. This early-stage investment is crucial. Philanthropists willing to accept a degree of investment risk in such ventures are invaluable.”



Understanding and avoiding the spread of disease between humans and wildlife

Dr. Suzan Murray,
Program Director of the Global Health Program and Chief Wildlife Veterinary Medical Officer, Smithsonian National Zoo and Conservation Biology Institute, USA

“You’ve researched the connections between human, wildlife and environmental health. What were the results? And how might your findings help prevent future diseases?”

Our program is built on the philosophy that the health of all species – human and animal – is linked closely to each other and the environment. In this interconnected world, disturbing one system affects others. So to respond to this pandemic, prevent future pandemics, and protect all human and animal life, we must approach things in an all-encompassing way.

Science has demonstrated that nearly 75% of emerging zoonotic diseases (diseases that jump from animals to humans) start in wildlife populations then spread to people. We can deter emerging diseases – saving millions of lives and trillions of dollars – by:

- conducting concurrent wildlife and human surveillance at high-risk interfaces
- engaging high-risk communities from the start
- better understanding the factors that lead to disease spillover and spread
- helping laboratories identify and characterize viruses
- creating rapid-response veterinary teams to respond to and contain pathogens before they spread to the human population.

How do you respond to people that say eliminating bats will prevent viruses crossing over to humans?

Data has shown that bats, rodents and primates are the species most likely to transmit zoonotic diseases to humans. That’s why our wildlife surveillance strategy focuses on these three species. But they play critical roles in our environment. For example, bats are important pollinators of trees and flowers. They also eat thousands of mosquitoes every night, helping fight illnesses like malaria. So the answer isn’t to eliminate them. Instead, we need to better understand the threats and find ways to live safely alongside them.

How can we minimize the risk of future diseases?

By recognizing how connected we all are – we can work together to conduct wildlife and human surveillance. And by understanding current viral threats and how humans put themselves at risk. Research has shown that many viruses emerge from unsafe human interactions with wildlife. These include hunting for bushmeat (meat from wildlife species), visiting wet markets, trading in wildlife, and working in animal supply chains without proper protective gear, like masks and gloves.

To reduce viral threats, we must introduce safe animal-handling practices; educate communities that rely on animals for their livelihood; and invest in human and wildlife surveillance and preventive care.

Why are pangolins being trafficked so heavily?

There are currently eight species of pangolin – four in Asia, and four in Africa – and all are either listed as vulnerable or endangered. Pangolins are calm and slow-moving, making them easy targets for poachers. Their meat is considered a delicacy in some countries, while their scales are used in traditional medicine. Pangolin scales, like rhino horn and fingernails, consist of keratin, and have no known medicinal benefits. It’s tragic that so many pangolins are killed due to false beliefs.”

How biodiversity loss affects us all

Dr. Abigail Entwistle,
Director of Science & Design,
Fauna & Flora International, UK

“How does biodiversity loss affect humans?”

Human life depends on biodiversity. Our fate is interwoven with every species on the planet. Nature provides food, regulates clean air and water, and underpins the planet's carbon cycle (the natural flow of carbon around the world). Neglecting nature, destroying habitats and exploiting wild animals reduces our access to food, damages agriculture, and leads to dangerous new pathogens.

Is it true that agriculture is one of the leading causes of extinctions?

Yes. A quarter of all mammal species and nearly 40% of trees species are considered at risk of extinction. The main cause is the loss of natural habitats. That's because habitats are so often converted for agriculture, for example, oil palm plantations in Indonesia and cattle ranching in Brazil. Agriculture drives 80% of deforestation. By weight, it's estimated that there are 14 times more livestock than wild mammals left on the planet. Many everyday products may also be linked to destroying natural habitats.

Why are people so slow to change their lifestyles?

Nature's values and services aren't built into the world's economic models. We're also increasingly distant from the natural world. Urbanization and globalization have separated people from the harmful results of their decisions. Biodiversity loss happens incrementally, and we fail to see the damage in real time. Despite scientists long predicting the consequences, it took the 2020 pandemic to wake the world up to the risks.

How connected are climate change and biodiversity loss? Can we address one and not the other?

Climate change and biodiversity loss are interlinked, so we must address them together. Biodiversity underpins the natural processes that drive the world's carbon cycle. There's also huge potential for natural habitats to store CO₂ or remove it from the atmosphere, helping alleviate climate change. So tackling climate change and biodiversity separately will lead to failure. Unfortunately, policies are rarely aligned, and nature isn't well integrated into governments' climate plans.

What advice would you give philanthropists who want to help?

Give generously over the long term and understand that you might not see results for many years. Be proud of your philanthropy – and let others know all about it. It's also worth knowing that the most effective philanthropic support goes to those living closest to biodiversity.

Many international NGOs help philanthropists support partners on the ground. For example, they make sure the money goes where it's most needed, and mentor partners to ensure donors' support is effective.

As a philanthropist, you can help fill the huge funding gap that hinders local conservation projects. If you're supporting mammal species, you might also back initiatives that help less represented plant species. For example, you could support projects to effectively manage and rewild (restore) damaged areas.

You can also encourage governments and companies (as a shareholder) to adopt:

- transparent and ethical supply chains
- a circular economy (an economic system that aims to eliminate waste and continually reuse resources)
- renewable agriculture and energy systems.”



02 Getting started

Tackling environmental issues and biodiversity loss is a huge and complex task. There's no magic wand that can instantly wave the problem away. Because nature takes time to recover. So where should you focus your support? And what's the best way to get involved?

To find the path that's best for you – and where you can make the biggest difference – it pays to understand the issues, root causes and just how much needs to be done.

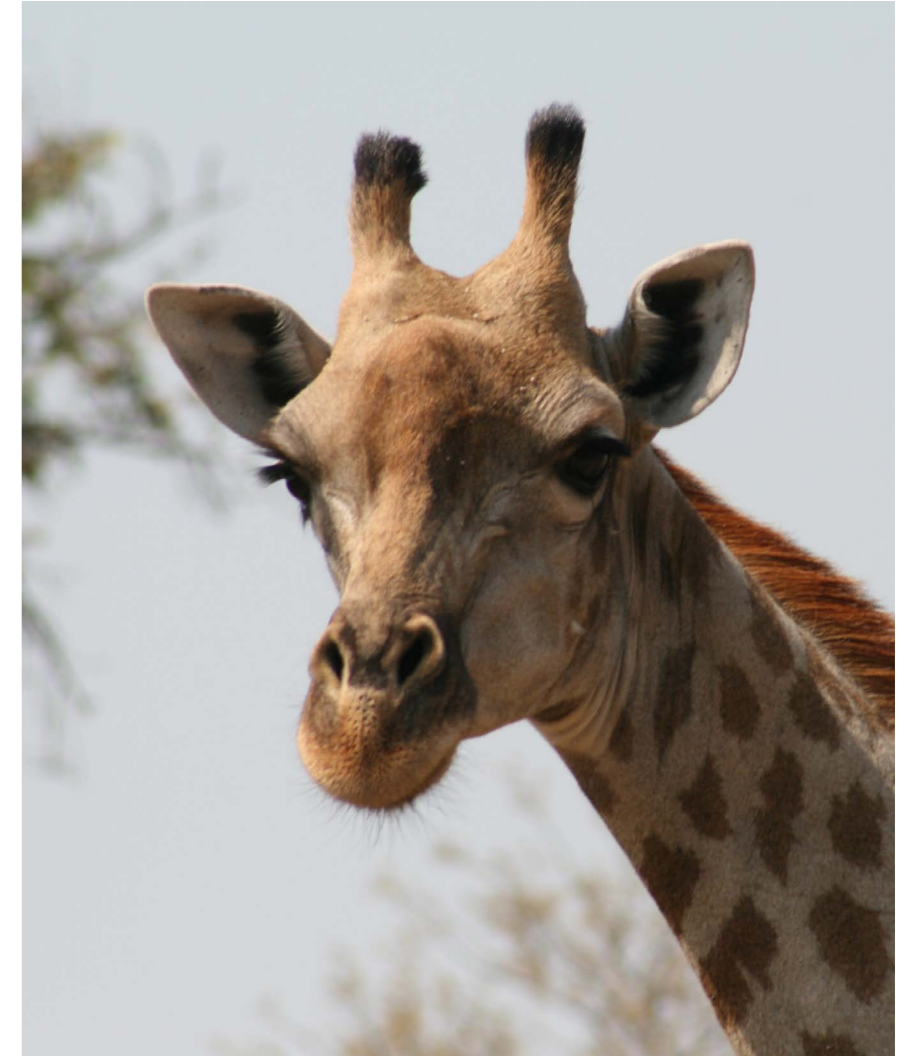
This section explains how you can start protecting and restoring life on land.

Funding conservation and biodiversity

Funding to tackle biodiversity, conservation and climate issues is limited, across public and private sectors alike. In a world of tightening budgets and struggling economies, public sector funding isn't likely to increase any time soon.⁶⁸ So there's a big gap between the funding biodiversity receives and the money it needs.

Global biodiversity funding from all sources is estimated to be up to 91 billion US dollars each year. That seems a lot, but it's only equivalent to around 0.1% of global Gross Domestic Product (GDP).⁶⁹ To reverse biodiversity's decline by 2030, research suggests the world needs to spend between 722 and 967 billion US dollars every year for the next ten years. Currently, the biodiversity funding gap is an average 711 billion US dollars – or between 598 to 824 billion US dollars every year.⁷⁰

Private sector investments must fill the gap. But they will only be useful if the world has the right policies, regulations and incentives in place.⁷¹ Philanthropy has a big role to play in making this happen. For example, philanthropists can help develop financial solutions and policies, support research, and reduce project risks to encourage people to invest significantly in biodiversity.



⁶⁸ The World Bank. (2012). Expanding Financing for Biodiversity Conservation. Washington D.C.

⁶⁹ OECD. (2020). A Comprehensive Overview of Global Biodiversity Finance Final report.

⁷⁰ Ibid.

⁷¹ Deutz, A., Heal, G. M., Niu, R., et al. (2020). Financing Nature: Closing the global biodiversity financing gap. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability.

Solving the funding challenge

Gemma Goodman,
Head of Conservation Programmes,
Synchronicity Earth, UK

Individuals, trusts, foundations and statutory (government) bodies are the main sources of income for environmental charities. But traditional funding alone can't always act quickly or significantly enough. This is shown in downward biodiversity trends; increasing loss of forests, wetlands and nature-based livelihoods; and increasing violence towards indigenous people and local communities. In short, environmental projects need a big funding boost – and fast.

The natural challenges facing our planet can seem overwhelming. It can also be hard to connect those challenges with our own lives – and to know which of the many charities to support.

What's more, funding is either scarce or deployed ineffectively.

Funding is typically:

- provided over the short term (one to five years). But solving the challenges by changing the world's systems will take much longer
- not directed where it's most needed. The key to lasting successful conservation is to embed funding in the affected countries, regions and communities. But giving to local groups can seem too risky and time consuming
- not enough to pay for core costs and building capacity, such as training and empowering conservation leaders in countries with the healthiest ecosystems and biodiversity.

The good news is, we've discovered some great ways to support conservation and biodiversity:

- Identifying quality conservation organizations that can help philanthropists give to the right causes.
- Combining and launching pooled investment funds. These pooled funds reduce administrative time and costs, provide learning opportunities for philanthropists, and unlock opportunities for long-term funding.
- Setting up endowments to provide long-term and consistent sources of funding. Working with businesses that focus on strong environmental, social and governance principles.



02.1 Ten tips to start your philanthropic journey

1. Reflect

Think about your values and priorities. What motivated you to focus on the environment? What assets and expertise can you put to work, for example, money, time, networks and skills?

2. Research and understand

Think about the issues you'd like to address and research them, for example, by browsing online, reading reports, talking to experts, and attending webinars or conferences. Consider where your support is most needed, and find out what other people and organizations are doing already.

3. Define, refine and focus

Philanthropists and organizations that make the biggest difference are those that have clearly defined an issue, and focused their resources on finding an effective approach or solution. Defining, refining and focusing on an issue will help you shape your vision. It will also clarify why you're getting involved, how you're providing support and who will benefit from your efforts.

4. Turn your vision into a plan

Consider how you can maximize your impact. Set clear goals and make a logic model (words or diagrams describing your activities and goals). This will help you understand how the resources you use (inputs), can trigger activities and outputs (results), which generate outcomes (actual changes) that maximize your impact.

5. Use the right charitable vehicle

A vehicle is only a means to reach your goals. You can choose from many different types of charitable solutions, including foundations, charitable trusts, donor-advised funds and even giving directly to the charity. Pick a solution that's right for you and your vision.

6. Be brave and think big – there are no rewards without risk

Protecting life on land is a big task. But being a philanthropist frees you to rise to the challenge. Try new approaches, learn along the way, adapt your plans as you go, and gather evidence at every step. Proving your work is successful will help you attract more investors and expand your efforts.

Need help on your philanthropic journey? Our UBS philanthropy advisors can help you maximize your impact locally, nationally and globally. To learn more and access guides and resources, please visit ubs.com/philanthropy

7. Measure, learn, adapt and share

Seasoned philanthropists understand the importance of asking smart and challenging questions about their efforts. They also use qualitative and quantitative measurements systems that are ethically, culturally, and financially appropriate. If you're willing to share your insights, even better – you'll really be advancing the cause.

8. Collaborate with others

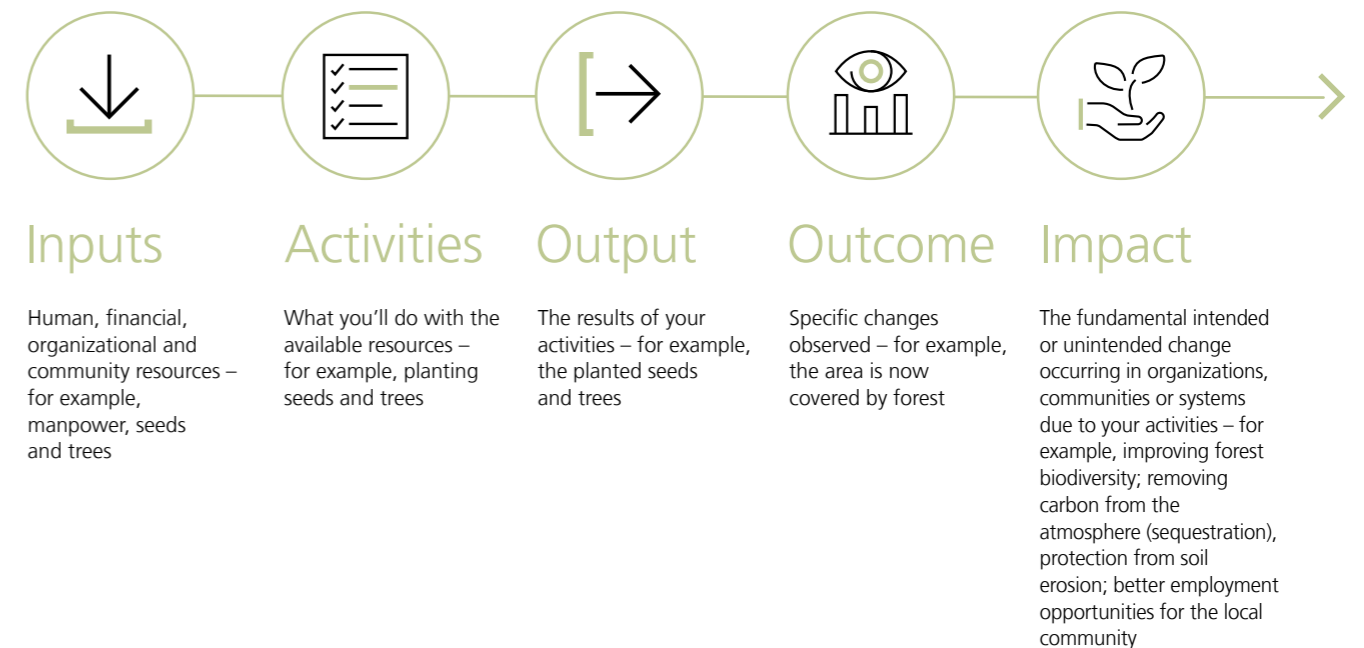
The issues facing the planet are too big for any individual or organization to tackle alone. Collaborating with others will achieve more because you can combine your resources, expertise and influence. Working on your own means you may only achieve results locally.

9. Think beyond philanthropy

There are many paths to making a difference, and they can all complement each other. Awarding grants is one. Social financing in the form of equity or loans is another. Or you could look into engaging personally with a cause, setting up your own venture, and investing sustainably.

10. Enjoy the journey

No one has ever achieved greatness without being passionate and enthusiastic. So enjoy the journey, knowing you're helping create a better world for everyone.



02.2 Expert tips for philanthropists

We asked respected experts to share their top tips with other philanthropists. Here's what they said...



Get expert advice

The climate and biodiversity crises are urgent and entwined. Like the Royal Society for the Protection of Birds (RSPB) and its partners, you can make a real impact on these global problems. Speak to your philanthropy consultant to find out how you can make a difference. **Mike Annison, Head of Partnerships, RSPB, UK**



Connect economies with the environment

This is especially important in very poor countries. Philanthropists should encourage local players to conserve biodiversity in ways that also develop their economies. In time, and with the right support, local farmers will understand the key challenges. It's time to act now. **Olivier Behra, Founder, Net Positive Impact program, France**



Support people and nature

Invest in programs that support local people who depend on natural resources. Such programs should recognize their rights to those resources. They should also empower people to improve their livelihoods by managing their resources sustainably. Additionally, invest in programs that restore degraded areas, remove greenhouse gas emissions from the atmosphere, and ease pressure to clear natural areas. **Garo Batmanian, Global Lead for Forests, Landscapes, and Biodiversity, World Bank, USA**



See the big picture

Around 70% of the world's poorest people rely on rainfed agriculture. This makes them uniquely vulnerable to climate change. The most powerful efforts are those that simultaneously support the environment and livelihoods for smallholders, like agroforestry. **Evan Axelrad, Manager Business Development, One Acre Fund, Kenya**



Join forces

Currently, solutions for food and land use are siloed. Focusing on just one issue means we miss opportunities to grow our efforts. It also means we disperse valuable resources among small and often competing initiatives. Finding common ground and joining forces across the climate, nutrition, biodiversity, health, and social justice communities will drive the scale of change required. **Jess Ayers, Director Climate Change, The Children's Investment Fund Foundation, UK**



Be courageous

Solving the global biodiversity crisis will involve traditional funding. But philanthropists must also be ready to experiment and fund bold projects that empower local communities. Real change requires new approaches. It requires us to be fearless about failing, and ready to learn from our mistakes. **Adrian Dellecker, Head of Strategy and Development, Luc Hoffmann Institute, Switzerland**

Need help on your philanthropic journey? Our UBS philanthropy advisors can help you maximize your impact locally, nationally and globally. To learn more and access guides and resources, please visit ubs.com/philanthropy



Invest in holistic and scalable approaches

This is our best chance to protect biodiversity and ecosystems, and the benefits they provide. It also helps us prevent global shocks, and gives us the resilience to withstand them. **Arent Fock, Chairman of the African Parks Foundation Switzerland, Switzerland**



Collaborate with others

Together we can restore our planet's wellbeing. So work with local communities. Give them the tools they need to rebalance the world's ecology. Raising awareness and uniting local people to protect their environment is key to conserving wildlife. **Marat Karpeka, Founder, Marat Karpeka Lemur Foundation, USA**



Act now

Even small changes have big effects on the global system. There's just one option – fight for a positive future! **Saskia Kress, CEO of Filmtank and the Interactive Media Foundation, Germany**



Get your hands dirty

Philanthropy can help you connect with a vast array of life on land. For example, protecting ecosystems from invasive alien species improves crop yields and secures food for vulnerable communities. It can even save species from extinction. The only limit to your impact is your ambition. Pick carefully the organizations you want to support, and meet the people you'll be investing in. Get your hands dirty! **Alistair Holt, Head of Trusts and Foundations, CABI, UK**



Find your passion

Above all, you need to focus on an issue you're passionate about. I've cared about animals since I was young, so translating that passion into philanthropy came naturally to me. I believe in supporting lean organizations that are as close to the area of impact as possible. **Nicole Honegger, Founder, Leopardess Foundation, Switzerland**



Invest in nature

Help people, biodiversity and the climate in one stroke, and bet on the kind of innovation that only billions of years of evolution can deliver. **Niki Mardas, Executive Director, Global Canopy, UK**



Choose the right partners

We must first recognize that we are all connected and all have a role to play and a responsibility to act. Find organizations that share these values and support them. Look for a group that has a scalable model and that partners well with other organizations. This enables you to leverage their resources and networks, and maximize your impact. Dr. Suzan Murray, Program Director of the Global Health Program, and Chief Wildlife Veterinary Medical Officer at the Smithsonian National Zoo and Conservation Biology Institute, USA



Talk to other funders

You'll tap into decades of expertise from battles won and lost. With ten years left to achieve SDG 15, there isn't time to reinvent the wheel. New funders must lean on the experience of others. Shloka Nath, Executive Director, and Amita Ramachandran, Program Lead, India Climate Collaborative, India



Know the landscape

Identify the most successful strategies and organizations that are driving the biggest changes – and invest substantially in them. Nicole Rycroft, Founder and Executive Director of Canopy, Canada



Support solutions that are good for both people and planet

We need to tackle the climate emergency and protect nature for future generations. We can't do this unless we also build resilient communities, tackle social inequality and accelerate economic inclusion for the most vulnerable. Katherine Stodulka, Director, Blended Finance Taskforce, SYSTEMIQ, UK/Indonesia



Take risks

Philanthropists must be willing to take risks when investing in conservation. They may reap significant rewards – but most likely over the long-term. To achieve even more, it's important to be open to collaborating with other funders. Gemma Goodman, Head of Conservation Programmes, Synchronicity Earth, UK



Be patient

You may need to wait many years before your efforts yield results. So be patient. These are long-term programs with long-term impacts. Dr. Amy Vedder, McCluskey Fellow and Lecturer, Yale University, School of Forestry and the Environment, USA



Consider the link between SDG 15 and climate action

Climate change is a major cause of degraded ecosystems. Promoting sustainable land use supports SDG 15 and, simultaneously, helps prevent global warming. Felicitas von Peter, Founder and Managing Partner, Active Philanthropy, Germany



Just do it

Climate change is the defining issue of our time. Use your time and talent right now to support initiatives and non-profit organizations that promote conservation, educate the public, increase biodiversity, and reduce climate change. Richard Hartung, Treasurer, Roots & Shoots Lead and Finance Lead, Jane Goodall Institute, Singapore



Help the most vulnerable first

The COVID-19 pandemic taught us that we must first help the less fortunate meet their basic needs, then work with them to adopt new norms. The same strategy will help us address biodiversity loss and climate change. Darrel Webber, Managing Director, Global Forest Strategies, Earth Innovation Institute, USA



Spend time with the people you're supporting

Talk to the people who are living with the challenges of biodiversity loss and climate change. Find a locally and nationally trusted organization that's making a big difference – and invest in it for the long term. Mike Watson, CEO, Lewa Conservancy, Kenya



Tackle the climate and biodiversity crises together

We won't deliver on our climate objectives if we don't restore nature. Nature will also suffer if we don't seriously address climate change. Dr. Mark Wright, Director of Science, WWF, UK



Join a collective

Philanthropists are increasingly teaming up in funding collectives. These collectives combine public, corporate and government funding, and put the money to work on saving species and ecosystems. That's where philanthropy can make a difference – acting as a catalyst for those on the frontline protecting nature, from rangers to indigenous people and local communities. Wes Sechrest, CEO Global Wildlife Conservation, USA

03 Taking action

“The best time to plant a tree was 20 years ago. The second-best time is now”

Chinese proverb

03.1 How to end deforestation and restore degraded forests

You can help in two ways:

- Prevention: Support programs that either protect forested areas, or promote production methods and consumption habits that reduce the need to cut down forests.
- Restoration: Support programs that focus on restoring degraded or fragmented forests, or reforesting lands that have been cleared of trees.

Ending or reducing deforestation means changing the whole system. To do that, we need to advance the world’s political agenda.

How? By encouraging governments to:

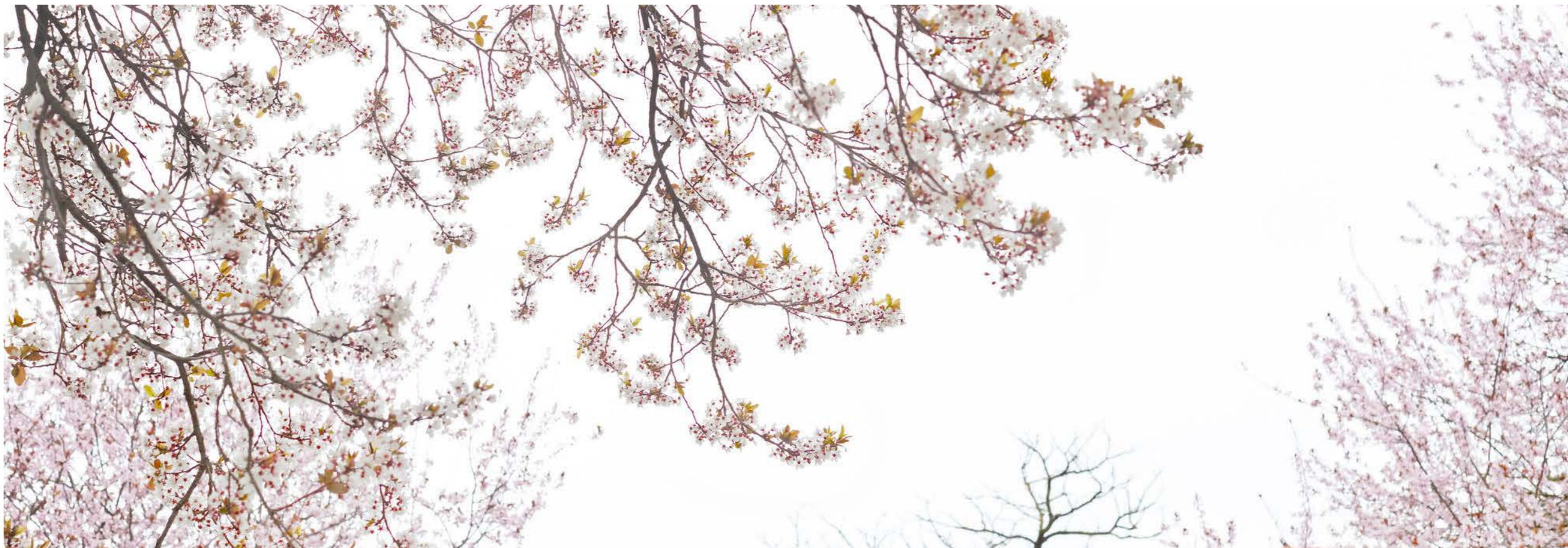
- introduce regulations that forbid or control illegal logging, especially in primary forests which host the highest density of biodiversity
- reduce budgets and subsidies for activities that harm biodiversity and the environment, and redirect the money to sustainable businesses
- restore deforested areas and use scientific knowledge to properly restore biodiversity and environmental services
- enforce regulations. Most tropical countries have laws to control deforestation, but lack the resources to enforce them.

For example, past Brazilian governments strictly enforced deforestation regulations and, with the help of NGOs and local communities, significantly slowed deforestation rates between 2005 and 2015.

Tree cover and primary forest loss in the Brazilian Amazon, 2002 to 2019



Source: Butler, R. A. (2020). Brazil's forests. Retrieved from <https://rainforests.mongabay.com/brazil/>



- Consider social issues. More than 600 million people live close to or in a forest, and depend on it for their livelihoods. It's vital to help local communities move away from harmful practices to sustainable approaches. For example, agroforestry involves planting trees on agricultural and pastoral land. The benefits of this include giving farmers diverse income sources; providing environmental services such as water retention; reducing climate change; and creating shade for cattle and corridors for wildlife. Additionally, simple soil management techniques like mulch farming, cover crops and organic amendments can prevent soil erosion and maintain soil fertility. In turn, there's less need to cut down forests for agriculture.
- Enable a better economy. Global economic forces drive deforestation. Encouraging consumers to choose sustainable goods from sustainable businesses plays a big role in reducing deforestation.

Ideas:

- Focus your efforts on tropical forests, because they're home to the highest diversity of plants and animals. Find out more about the world's biodiversity hotspots.
- Consume less – and eat less red meat. Forests are often cleared to create fields for cattle, or to plant soybeans to feed cattle.
- Consume more responsibly. When shopping, look for products with recycling logos and sustainable or responsible business certifications.
- Invest more sustainably. Putting money into companies with sustainable supply chains that don't harm the environment is a good step.
- Raise awareness. Support NGOs and associations that raise awareness on abuse and unsustainable practices; engage local communities; and help restore degraded forests. Also educate your children, family and friends, and let them know about your commitments.

Ending deforestation with innovative financing solutions

Bastien Sachet,
CEO, Earthworm Foundation,
Switzerland

"Today, around 861 billion tons of carbon are locked away in the world's forests. That equates to about 85 years of fossil fuel emissions. But we're losing this precious natural carbon storage to agriculture and fire.

To help local communities thrive and preserve their forests, we work with producers, farmers, and companies to address issues in their supply chains. Our "Forest Conservation Fund" makes saving forests as easy as planting trees, by linking companies and individuals to forest conservation projects.

Protecting our forests is one of the least expensive ways to reduce carbon emissions. It also brings countless other benefits like clean air, and healthy wildlife habitats and rivers. Only humans are cutting forests down. So the solution lies with us and you!"

Helping new solutions take root

Darrel Webber,
Managing Director of Global Forest Strategies, Earth Innovation Institute, USA

“What are the best ways to end deforestation and restore degraded forests?”

Tropical forest nations can keep their forests by shifting from the world’s current model: trading natural assets for social and economic gain.

Interestingly, the biggest champions of climate action are countries that still trade in this way. They know the consequences of a world without forests. But they fear that locking their natural assets away will limit their development and ability to put food on people’s tables.

So how can we protect our forests? First, we must understand how much it costs countries to keep them. Second, we must help them find ways to offset those costs through alternative development routes. To do this, they will need partners – partners with knowhow, partners who will buy the products, and partners to share the financing and risk of exploring new approaches.

To keep things moving, countries should establish these partnerships straightaway. Waiting for rainforest nations to progress significantly before launching partnerships is a flawed strategy.

In 2014, around 30 jurisdictions – representing a third of tropical forests – declared they would reduce deforestation by 80% by 2020. Unfortunately, no significant partnerships were developed. So launching partnerships in those regions is a great place to start.

How have your thoughts about land and forests changed over time?

In my youth, I thought forests could repair themselves if left alone. But after spending decades conserving forests, I know this isn’t true. Once a forest is cleared for other uses, it rarely returns to its previous state, even when left alone. We need to fight climate change with reforestation. But we must focus on not losing any more forests.

How much time do we have before we reach the point of no return?

We’re dangerously close to the point of no return in many parts of the world. Forests are disappearing steadily, even though the global deforestation rate has fallen over the last decade. But that rate isn’t spread evenly across geographies. Some regions are reversing the trend, such as China, Europe and the US. But I’m sad to say, we’re not yet seeing this progress in tropical forest nations.

We must establish measures to protect forests (especially tropical forests) within the next ten years. Because that’s all the time the scientific community says we have left to avoid runaway climate change.”

The problem with palm oil

Shara Ticku,
CEO and co-founder,
C16 Biosciences, USA

“Palm oil is the most popular vegetable oil in the world. It’s found in nearly 50% of products on supermarket shelves: in foods including peanut butter, cookies and baby formula, but even in soaps, shampoos and lipsticks.⁷²

As demand for palm oil skyrocketed over the last 50 years, palm producers engaged in slash and burn tactics, destroying tropical forestland and carbon-rich peatlands along the equator. This cleared the way for palm oil production.

Indonesia lost more than 24 million hectares of forest from 2001 to 2017, while Malaysia lost more than 7 million hectares.⁷³ This deforestation leads to significant CO₂ emissions, as the forests and peatlands are crucial terrestrial carbon sinks. In addition to the massive impact on global warming, destroying forests for palm oil plantations threatens biodiversity hotspots, erasing the habitats of endangered animals such as orangutans, rhinos, and tigers. Over 100,000 Bornean orangutans died between 1999 and 2015.⁷⁴ All three species of orangutan are now critically endangered. If the current rate of population decline continues, they will be extinct within our lifetime.

C16 Biosciences enables consumers to buy the products they love without contributing to climate change. We make that happen by shifting the way we make ingredients – specifically oils and fats – through cleaner supply chains. C16 has developed a new, cleaner, way of producing palm oil – using something called bio-manufacturing – which is similar to how we make beer, wine and cheese today.

To truly achieve net-zero deforestation, we must end the case for deforestation by creating better alternatives.”



⁷² RSPO. (2013). Why palm oil matters in your everyday life. Retrieved from www.rspo.org

⁷³ Global Forest Watch. (n.d.). Indonesia deforestation rates and statistics. Retrieved from www.globalforestwatch.org

⁷⁴ Voigt, M., Wich, S. A., Ancrenaz, M., et al. (2018). Global demand for natural resources eliminated more than 100,000 Bornean orangutans. *Current Biology*, 28(5), 761-769. DOI: 10.1016/j.cub.2018.01.053

03.2 How to support nature reserves

Did you know? Less than 15% of our planet's surface is protected.⁷⁵

The protected area categories:

- 1a. Strict nature reserves
- 1b. Wilderness areas
2. National parks
3. Natural monuments or features
4. Habitat/species management areas
5. Protected landscapes/seascapes
6. Protected areas with sustainable use of natural resources

Idea: Support new sustainable nature reserves; explore alternative ways to finance them; and help grow staff numbers on reserves.

Today, less than 15% of our planet's surface is protected. Scientists are aiming for 30%, and to add 20% more land as climate stabilization areas. This will lead to 50% of land being left in its natural state.⁷⁶

Well-designed and managed protected areas, such as national parks, safeguard ecosystems. They also provide wildlife with a permanent home, and give people safe access to nature. Research has proven that nature reserves protect biodiversity. More plants and animals, and a wider variety of species, reside inside them than outside.⁷⁷

Protected areas are crucial to biodiversity.⁷⁸ They offer the opportunity to reverse biodiversity loss by 2050 – but only if we increase protected areas to 40% of land surface, alongside other interventions.⁷⁹

The International Union for Conservation of Nature (IUCN) recognizes six categories of protected area.⁸⁰ Supporting these areas and protecting valuable ecosystems are huge steps towards conserving biodiversity and reversing the loss. Well-managed restoration programs are also valuable, benefiting biodiversity and human wellbeing.⁸¹

But it's always better to preserve ecosystems than to lose them in the first place. There are various ways to support nature reserves, depending on the location, local people and specific circumstances.



How protected areas can support biodiversity

David Meyers,
Executive Director, Conservation
Finance Alliance, USA

“Possibly the best and most direct way to conserve biodiversity is to create large protected areas of land. There's a big push to expand protected areas globally, such as the “30x30” initiative, which aims to protect 30% of the world on land and sea. But these initiatives are largely underfunded. Typically, public-private partnerships negotiate partnerships with governments to manage large protected areas.

Some protected areas receive funding through:

- **revenue-based models** like ecotourism as a source of income (for example, entrance and activity fees, and concessions)
- **blended finance approaches** – impactful solutions that mix philanthropy and high-risk/low-financial return investments, and are designed to attract more traditional investors
- **debt-for-nature swaps**, which involve organizations buying back government debt. The new debt owner receives a return, while the local government pays less to service that debt. This frees up money for conservation. The opportunities here are huge, as many island countries are heavily in debt following the crash of tourism in 2020 due to COVID-19.”

⁷⁵ Dinerstein, E., Vynne, C., et al. (2019). A Global Deal For Nature: Guiding principles, milestones, and targets. *Science Advances*. Vol. 5, no. 4, DOI: 10.1126/sciadv.aaw2869

⁷⁶ Ibid.

⁷⁷ Monash University. (2014). Protected areas proven to protect biodiversity. *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2014/08/140828110937.htm

⁷⁸ WWF. (2020). *Living Planet Report 2020*. Bending the curve of biodiversity loss. Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland.

⁷⁹ Leclère, D., Obersteiner, M., Barrett, M., et al. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. *Nature* 585, 551–556. <https://doi.org/10.1038/s41586-020-2705-y>

⁸⁰ IUCN. (2019). Protected Area Categories. Retrieved from <https://www.iucn.org/theme/protected-areas/about/protected-area-categories>

⁸¹ Gann, G. D., Lamb, D. (2006). *Ecological restoration: A mean of conserving biodiversity and sustaining livelihoods*. Society for Ecological Restoration International, Tucson, Arizona. And IUCN, Gland, Switzerland.

Protecting biodiversity with nature reserves

Arent Fock,
Chairman, African Parks
Foundation Switzerland,
Switzerland

“Why are protected areas so important for conserving nature?”

Protected areas represent a substantial portion of the world’s remaining biodiversity. When managed well, they do much more than conserve wildlife and protect the habitats of millions of species. They also provide stability, food security and clean water; regulate our climate; create employment; strengthen local economies; curb the spread of disease; and safeguard vital natural resources.

What’s unique about African Parks’ public-private partnership approach to conservation?

We enter into long-term agreements – lasting 20 years on average – that make us fully responsible for managing protected areas on behalf of governments. We’re 100% accountable for all aspects of the park. No other NGO in Africa uses a fully delegated management approach at this scale. Our work spans 19 parks across 14.2 million hectares in 11 countries.

What challenges and threats do protected areas face?

There are many challenges and threats, and most are connected. They range from illegal wildlife trade to demand for protein and energy, habitat destruction and climate change. Most protected areas are poorly managed, and lack funding and expertise. They generate little value and are at risk of being lost entirely.

What does it take to protect nature reserves for the long term?

Three things enable us to protect reserves nationally and locally:

- The mandate, which is our long-term contractual agreement with the government.
- Money from philanthropic donations, plus park revenues.
- Good management – the people, systems and processes that ensure we run our parks properly and inclusively. Each park has a local governance board representing partners, including governments and communities. We also implement broad operations to ensure ecological, social and financial sustainability.

What does success mean to you?

Success means keeping much of the planet’s ecosystems intact – preserving healthy, functioning and biodiverse landscapes for future generations. We aim to protect 30 parks by 2030 – which contributes to conserving 30% of the planet by 2030.”

How tourism can protect nature reserves

Dr. Amy Vedder,
McCluskey Fellow and Lecturer,
Yale University, School of Forestry
and the Environment, USA

“How can nature reserves and protected areas conserve biodiversity?”

The biggest reason we’re losing biodiversity right now is that people are converting land for other uses. Industrial food production, logging and mining completely change the land’s resources and ecological systems. To save biodiversity – among other approaches – we must designate certain lands for this purpose. Conservation reserves and protected areas are clear and unambiguous ways to accomplish this.

Humans are entering and using ecosystems in non-traditional ways, and at a rate and scale we’ve never seen before. At the same time, we’re transporting bits and pieces of natural systems across the globe into markets and environments that were previously inaccessible. We’re seeing a simultaneous acceleration of human, economic, and technological impacts on natural systems that’s unsustainable and harms biodiversity.

We have to step back and be much more careful about how we affect these systems. We also need to think about the restrictions we’re willing to accept to ensure natural systems can thrive.

How can nature-based tourism (ecotourism) support nature reserves?

Ecotourism can be a tremendous aid to supporting protected areas. When developed responsibly, it aims to:

- provide revenues that help sustain and manage protected areas and their species
- be socially responsible, sharing the costs and benefits of tourism with local people
- help visitors better understand and appreciate nature.

To avoid failure, ecotourism should never be a protected area’s sole source of income. For example, a local or national government could also commit financially to the area. Or, the area might receive support from a long-term trust fund. Or it could develop income-generating activities around the protected area, that are sustainable and complementary to tourism. It’s also essential to engage with the local community to ensure the system is owned locally and nationally. Dedicating national funds to invest and sustain protected areas and reserves makes them much more likely to succeed in the long term.

What advice would you give philanthropists and investors looking to support nature reserves?

Understand the system and people you’re working with. It’s important to partner with an experienced organization. I think international NGOs that work on biological conservation make great partners – and they’re always looking for collaborators to achieve their goals.

You might also provide a straightforward grant or put money in an investment that expects to deliver a financial and ecologically responsible return. Remember, it costs money to start and support a protected area, while strengthening its internal management. At the same time, it’s vital to collaborate closely with the nation state and local communities living nearby.”

03.3 How to fight poaching and wildlife trafficking

Fighting poaching and wildlife trafficking are complex issues involving various stakeholders. You might consider getting involved in the following activities.

- **Preventive actions**, which aim to avoid poaching and trafficking occurring in the first place:
 - a. **Raising awareness** among the public and governments to reduce demand for wildlife products like rhino horn. Around 100 billion US dollars are spent every year fighting drug trafficking, compared to 261 million a year for wildlife trafficking.⁸²
 - b. **Working with the trade sector** to prevent wildlife products being transported and commercialized.
- **Improving law enforcement** – although many countries have wildlife regulations, they may struggle to enforce the rules, for example, due to a lack of resources:
 - a. **Fighting corruption and improving governance are crucial, as corruption is common in trafficking.**
 - b. **Supporting research and analysis** to identify and eliminate loopholes in the law, and strengthen the global regulation system.
- **Enhancing collaboration** by working and sharing information across borders and between organizations has proved vital in targeting trafficking and preventing poaching. Working together makes it difficult for traffickers to operate effectively.

Whatever you choose to do, it's vital to **work with local communities**. Doing so makes sure they can better manage their natural resources – and that benefits are distributed equitably. This also includes supporting programs that:

- fight poverty
- educate communities on the value of protecting the environment
- provide training and resources for anti-poaching programs
- encourage communities to diversify their economies to gain sustainable alternative incomes.



Tackling the illegal wildlife trade

Cath Lawson,
Regional Manager for Africa
Conservation Programmes, World
Wide Fund for Nature (WWF), UK

“How widespread is the illegal wildlife trade?”

It is global, with more than 7,000 species affected, and driven primarily by Asian demand. It threatens to undo decades of conservation work. It's one of the biggest threats to many species and, by association, the ecosystem services and income they may provide to local communities.

The scale is shocking. Poachers slaughter around 20,000 African elephants every year. The African elephant population has fallen by around 90% over the past century, mainly due to the ivory trade. On average, more than 1,000 rhinos are poached annually. Every five minutes, a pangolin is snatched from the wild.

The illegal wildlife trade is estimated to be worth over 15 billion pounds sterling. And environmental crime, of which illegal wildlife trade is a part, is the fourth largest illegal trade in the world.

How does the trade affect people's lives?

It undermines laws, threatens peace and security, and hinders economic development for some of the world's poorest people. It is facilitated by corruption, aggravated by human rights violations and fueled by demand. Organized crime groups benefit from the trade's high profits, minimal risks and low penalties.

What advice would you give philanthropists who want to fight poaching and trafficking?

I recommend that philanthropists:

- provide the resources needed to end the illegal wildlife trade globally
- support and establish public-private partnerships to tackle the issue
- advocate the cause nationally and globally
- connect and collaborate with leading NGOs working to stop the illegal wildlife trade.

Combatting the crisis requires everyone to work together. WWF works closely with partners tackling the trade locally and globally. To end the illegal poaching, trafficking and buying, we all need to intervene throughout the trade's supply chain.

The world also needs stronger public-private partnerships working on the issue. The private sector, including the finance, transport, tourism and online sectors, have crucial roles to play in strengthening policies and practice to halt the trade.”

⁸²World Bank. (2019). Illegal Logging, Fishing, and Wildlife Trade: The Costs and How to Combat it.

Protecting wildlife in Kenya

Mike Watson,
CEO, Lewa Conservancy, Kenya

“What’s the current state of the wildlife trafficking industry?”

We’ve seen much progress in recent years, including increasing political will to end the trade. But demand for wildlife trade remains high. There have been some local successes. For example, rhino and elephant poaching numbers in Kenya are now negligible, thanks to the government, communities and private sector working together. That said, bushmeat poaching remains a challenging issue in Kenya and beyond.

What solutions have you implemented?

Working with our partner organization, Northern Rangelands Trust, we have empowered Kenyan communities to create and manage their own conservancy institutions. Kenyans across the country have embraced this. Today, there are more than 160 community conservancies in Kenya. The country also now has a national body – the Kenya Wildlife Conservancies Association (KWCA) – representing and advocating for conservancies nationally.

How can philanthropists join the fight against poaching and trafficking?

Donations remain very welcome. But there are also new financing solutions that should prove attractive to philanthropists, and private and corporate investors. Examples of these include carbon credits/offsets, Payment for Ecosystem Services (PES) and Green/Species Bonds. The solutions can also provide conservancies and NGOs with new income streams, to help secure their futures.”

Priority local, national, and global illegal activities policy actions

Local	National	Global
1. Establish / enhance property rights / tenure	1. Define natural resources crimes as a serious organized crime	1. Establish / leverage mutual legal assistance treaties and bilateral mechanisms to combat natural resources crimes
2. Establish mechanism for communities to contribute to land-use management	2. Enact national strategy to mobilize resources and build institutional capacity	2. Utilize international financial networks to conduct joint investigations across countries and jurisdictions as part of criminal investigations
3. Stimulate alternative economic opportunities	3. Establish legal and fiscal environment to catalyze investments	3. Contribute to and leverage data systems to generate transparent and reliable natural resources crimes data
4. Establish transparent mechanisms to ensure that the resources and benefits derived from ecosystem services payments flow to local communities and stakeholders	4. Undertake anti-corruption reforms and empower anti-corruption agencies	4. Create global markets and mechanisms to capture the value of ecosystems services including mitigation of GHG emissions
	5. Establish national mechanisms to capture the value of ecosystems services, including GHG mitigation, and their contribution to the economy	



Getting started in conservation

Nicole Honegger,
Founder, Leopardess Foundation, Switzerland

“Any wildlife conservation project – whether it’s about stopping poaching or securing safe habitats for wildlife – must involve local communities.

For example, conflicts between humans and wildlife are a growing issue worldwide. Whether you’re funding fences to protect crops or creating employment opportunities, involving local stakeholders will better protect animals and humans over the long term.”

Source: Adapted from World Bank. (2019). Illegal Logging, Fishing, and Wildlife Trade: The Costs and How to Combat it.

03.4 How to respond to climate change

Climate change poses many life-threatening challenges. So how do we proceed? By focusing on reducing greenhouse gas emissions and finding new ways to remove CO₂ from the atmosphere. To reach our goals, we can use diverse solutions, such as using more renewable energy and making transport more efficient. We also need to focus on areas like energy, agriculture and food systems. Equally, individuals and governments must understand the challenges – and the opportunities that solving them brings.

The Paris Agreement in 2016 set a target of limiting the global temperature increase to 1.5°C above pre-industrial levels. We now have many technological and nature-based solutions that can help us achieve this goal. For example, nature-based solutions can potentially remove 11 gigatons of CO₂ every year from the atmosphere, while enhancing biodiversity and conservation.⁸³

Ideas:

- Support advocacy and lobby regional and national governments to change agricultural practices, and develop conservation and regenerative agricultural techniques.
- Support programs that protect and restore natural carbon stores like forests and peatlands, or programs that aim to reduce emissions throughout supply chains and agricultural systems.
- Change your behaviors to reduce CO₂ emissions, for example, eating less meat, flying less and not installing air-conditioning systems.

How philanthropic foundations can create a greener world

Katherine Stodulka,
Director, Blended Finance Taskforce,
SYSTEMIQ, UK/Indonesia

“Philanthropic foundations can play a vital role in moving the world to a low-carbon, nature-positive, regenerative and resilient financial system. While foundations represent only around one trillion US dollars of assets under management, they can have an outsized impact in a variety of ways. They can:

- prove that new markets are viable: targeted grants can help show that early-stage businesses models are viable and investable
- support new projects: providing capital, expertise and access to networks
- make grant processes easier: easing the administrative burden on organizations applying for grants
- connect with other foundations: investments achieve much more when foundations pool their resources
- improve coordination: by investing in line with their missions, foundations can maximize the impact of their endowments, programs and grants.”



⁸³ Griscom, B.W., et al. (2020). National mitigation potential from natural climate solutions in the tropics. *Phil. Trans. R. Soc. B* 375: 0190126. <http://dx.doi.org/10.1098/rstb.2019.0126>

Nature-based solutions to climate change

St. John Anderson,
Co-founder and Director,
Carbon Tanzania, Tanzania

“What’s the best way to address climate change?”

Of several important ways to address climate change, avoiding tropical forest loss ranks high. Clearing and burning tropical forests accounts for 20% of annual global greenhouse gas emissions, more than the transport sector, so addressing it is critical.

Higher temperatures will hurt developing nations the most, especially in the tropics. Tropical forests are immensely valuable to developing economies. Losing them will harm the poor, remote and vulnerable. For example, increased temperatures spread fatal infectious diseases, cause crops to fail and lead to catastrophic floods.

Investments and financial solutions that compensate organizations to protect natural forests are a cost-effective way of mitigating climate change. They also support rural development in the world’s least-developed nations.

How does Carbon Tanzania approach climate change?

Carbon Tanzania generates carbon assets in the form of Verified Emission Reductions (VERs)⁸⁴. These arise from local resource owners protecting forests and managing land-use change, especially in Tanzania, where lost forests and converted land account for nearly 80% of emissions.

We sell VERs to companies, organizations and individuals committed to compensating the carbon emissions produced by their operations, activities and lifestyles, as part of a broader decarbonization strategy. It involves measuring, monitoring, reporting and verifying climate change impacts, and is known as Reducing Emissions from Deforestation and forest Degradation (REDD).⁸⁵

REDD is one of the most cost-effective and efficient ways to reduce emissions,⁸⁶ while benefiting society and biodiversity. It is an example of a nature-based solution⁸⁷ to climate change.

We share with resource owners most of the revenues from selling VERs. The remainder covers our operating costs. But the investment costs for REDD are high. This gives investors and philanthropists an opportunity to fund projects in their early stages. It also enables us to pay extra from revenues to resource owners, rather than use the money to repay debt.

What one piece of advice would you give a philanthropist looking to get involved in reducing climate change?

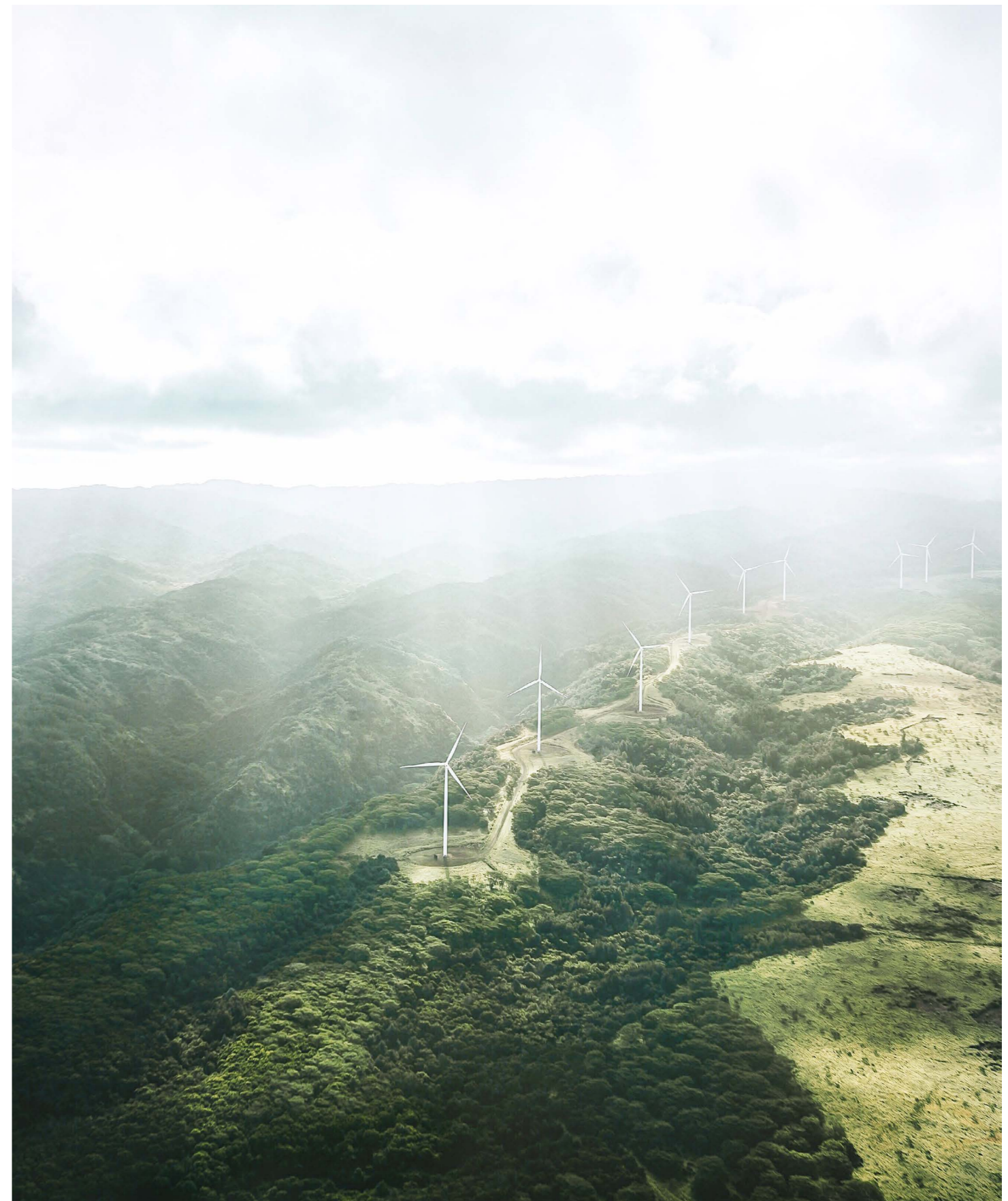
Direct your efforts toward countries and communities that are least able to deal with the effects of climate change. Developed nations are often more able to fund their own efforts.”

⁸⁴ One VER is a reduction in greenhouse gas emissions (GHGs) from a project that is independently audited (i.e., verified) against a third-party certification standard. Each verified emission reduction represents one metric ton of carbon dioxide equivalent emissions (mtCO₂e).

⁸⁵ International Institute for Environment and Development. (2020). REDD: Protecting climate, forests and livelihoods. Retrieved from <https://www.iied.org/redd-protecting-climate-forests-livelihoods>

⁸⁶ Griscom, B. W., Adams, J., Ellis, P. W., et al. (2017). Natural climate solutions. Proceedings of the National Academy of Sciences, 114 (44), 11645-11650.

⁸⁷ Nature-based Solutions are defined by the IUCN as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”. IUCN. (n.d.). Nature based solutions. Retrieved from <https://www.iucn.org/commissions/commission-ecosystem-management/our-work/nature-based-solutions>



Felicitas von Peter,
Founder and Managing Partner,
Active Philanthropy, Germany

“Don’t let the complexities of climate change put you off. Start by focusing on topics you’ve supported so far, and look at them from a climate perspective. And work with other experienced philanthropists. We’re stronger together!”

03.5 How to restore degraded land and prevent desertification



Idea: Support programs that research and engage with local communities, and help restore degraded lands for wildlife or conservation agriculture. You can also support policies that aim to protect and restore soil.

Preventing is better than curing.

Many agricultural approaches can help restore degraded lands, or avoid spoiling soil altogether. These include organic farming; less intensive cattle grazing; rotating crops regularly to allow vegetation to regenerate; and using manure and chemicals to enrich soil nutrients. Innovative equipment also plays an important role in irrigating land, and reduces the pressure of machinery on land.⁸⁸

Each approach is hugely valuable for fighting biodiversity loss. But remember – it's much more effective to prevent harm to land than to restore it. Solutions should be designed and implemented with local communities – and every policy must commit clearly to promoting sustainability.

How can investors slow and reverse land degradation?

Garo Batmanian,
Global Lead for Forests, Landscapes,
and Biodiversity, World Bank, USA

“Investors can help by putting their money into:

- sustainable land management and agriculture practices in already converted areas (including degraded areas) which improve crop yields, use efficient irrigation and keep soil healthy. Successful agriculture practices do not require clearing new areas
- programs supporting local communities depending on natural resources. Support includes recognizing their rights to resources and empowering them to manage natural resources sustainably. This improves livelihoods and reduces the risk of displacement (people needing to relocate)
- making commodity value chains environmentally friendly (greening)
- nature-based sectors, such as ecotourism.”



⁸⁸ Rossi, R. (n.d.). Desertification and agriculture - Think Tank. Retrieved from [https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI\(2020\)646171](https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2020)646171)

Restoring degraded land with agroforestry

Valter Ziantoni,
Founder, PRETATERRA, Brazil

“Forest-based agriculture (agroforestry) restores degraded land, regenerates ecosystems, and removes carbon from the atmosphere – and all while providing food, renewable materials and various ecosystem services. It’s the definitive way to regenerate land while providing profitable yields.

Agroforestry involves planting trees in agricultural systems. Trees provide shade, control microclimates and make ecosystems more resilient. By mimicking forests, agroforestry can produce reasonable amounts of quality food while conserving the environment.

We’re not just talking about a new form of agriculture. We’re completely transforming the system with a solution that produces food, tackles climate change and improves livelihoods.

If you were to give one piece of advice to a philanthropist looking to get involved in agroforestry, what would it be?

To deploy agroforestry worldwide, we need to structure data; automate designs; systemize inputs; standardize operations; and support on-the-ground projects. This will enable agroforestry to become the world’s new production system, providing food, fibers and fuel for our future.

Philanthropic investors should focus on:

- developing knowledge, software, and tools for designing, planning and managing agroforestry
- creating strong narratives that will encourage consumers to engage with agroforestry.”

Showing local communities the benefits of sustainable land management

Eufrazio Maratas Jr.,
Executive Director, RISE, Philippines

“The Philippines is a biodiversity hotspot, with only 3% to 4% of its primary forest cover left. It has one of the highest densities of biodiversity per hectare. So it’s a great place to make a big difference.

The Restoration Initiative for Sustainable Ecosystems (RISE) is a non-profit organization working with local stakeholders to conserve and restore forests, develop productive landscapes, and improve human wellbeing.

Agroforestry is a great alternative to conventional agriculture. But, theories and recommendations alone will never convince farmers to abandon their existing livelihood strategies and adopt unfamiliar agricultural practices. Educational forest farms are the answer, showcasing agroforestry systems and the benefits of managing land sustainably. For example, the farms demonstrate how communities can enjoy diverse income sources, rather than relying on revenue from single crops.

The farms also benefit biodiversity directly by improving habitats for wildlife and environmental services (water retention, better soil quality, carbon removal).

Once farmers start replicating this approach, conservation – and its many benefits – will spread far and wide.”



03.6 How to encourage governments to consider biodiversity in new policies

Prince Charles calls for global economy to recognize rights for nature

At the One Planet Summit held in Paris in early January 2021, Prince Charles, the future King of England and well known environmentalist, unveiled a new plan to help businesses align with environmental conservation outcomes. His 17-page document, Terra Carta, is designed to “bring prosperity into harmony with nature”. It also asserts that the “fundamental rights and values of nature” must be placed at the core of the global economy⁹¹. Part of his established Sustainable Markets Initiative, the document’s statement of intent includes commitments to restoring biodiversity, the Paris Climate Agreement, and reaching the Sustainable Development Goals. Signatories to the voluntary framework will ensure a business focus on protecting 50% of the biosphere and achieving net-zero emissions, committing to 100 measurable actions by the middle of the century. The charter aims to raise and invest 10 billion US dollars for environmental causes and has already been backed by a number of institutions.⁹²

Advocacy is about communicating with and persuading those in power to act differently. It’s about influencing people, steering new policies and changing systems. And it’s about building relationships to tackle the root causes of environmental degradation and climate change.

Advocacy uses processes that complement and support other activities, such as data gathering, analysis, campaigning and awareness raising. Some believe advocacy for biodiversity and climate change is essential because the environment requires people to speak on its behalf. Public awareness and support, together with political will, can halt biodiversity loss and drive lasting and meaningful change.

How can we put biodiversity at the top of government agendas? By focusing on three areas:⁸⁹

- 1. Problems:** Raising awareness so biodiversity loss becomes too big of an issue for governments to ignore; working with key stakeholders like environmentalists or conservationists; helping communities speak out about environmental harm and abuses; exposing the damage of biodiversity loss through the media.
- 2. Policies:** Encouraging economists, conservationists and policymakers to collaborate on developing evidence-based, biodiversity-friendly policies.⁹⁰
- 3. Politics:** Creating the right conditions for change by ensuring policy goals match governments’ ambitions; building bridges between national biodiversity policies and other policy areas; keeping in touch with the people implementing the policies to make sure they work in the real world; accelerating change by encouraging ministers to keep driving progress.

Ideas:

- Understand the system. Government responsibility for managing natural resources is usually spilt between different administrative teams. So it’s crucial to understand the political system.
- Involve local communities. Local people can do a great job advocating change – because they’re closest to the issues that affect their lives. Their stories can also bring your campaign to life.
- Talk to the experts. Environmental and conservation organizations can provide expert insights on managing natural resources and conserving biodiversity. The more complicated the problem, the more organizations will be involved. Each will have different opinions. But these different perspectives can strengthen your campaign.

Putting biodiversity at the center

Wes Sechrest,
CEO, Global Wildlife
Conservation, USA

“The climate crisis is finally at the top of government agendas. But the same can’t be said of biodiversity loss. That’s a mistake. Because biodiversity is key to creating a stable climate.

The good news is, we can still protect many remaining natural areas and restore lost ecosystems. Rewilding (restoring) areas can sequester (remove) massive amounts of carbon at low cost – while benefiting climates globally and locally. Rewilding our planet begins in backyards and city parks, and extends to the grandest ecosystems, such as the Great Barrier Reef and the Congo Rainforest.

Our work with governments starts with sound science. Such science is found in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, and Key Biodiversity Areas – the map of irreplaceable sites for biological diversity. My organization and many others collaborate on achieving significant global biodiversity targets. This makes us a credible joint force for approaching governments.

To protect biodiversity and all life on Earth, communities, indigenous people, organizations and governments need to recognize that entire systems must change. Many governments, including those in the European Union, Costa Rica and New Zealand, are leading the way in addressing the challenges. For example, to address urgent threats to biodiversity, we worked with the EU to launch the Rapid Response for Ecosystems, Species and Communities Undergoing Emergencies (Rapid RESCUE) initiative.

Changemakers drive public awareness and political will. History shows that a few committed people and organizations save most species, such as the Black-footed Ferret and Kakapo parrot. The same is true for ecosystems, including jewels of nature like Yellowstone National Park and Virunga National Park.

Together, we can fight the climate and biodiversity crises by focusing on nature-based solutions.”



⁸⁹ Kingdon, J. (2003). Agendas, alternatives, and public policies, 2nd edn. Longman, New York.

⁹⁰ University of Cambridge. (2010). In order to save biodiversity, society’s behavior must change, leading conservationists warn. Retrieved from <https://www.sciencedaily.com/releases/2010/09/100909141527.htm>

⁹¹ One Planet Summit. (2021). One Planet Summit Biodiversity: Action Commitments for Biodiversity. Retrieved from <https://www.oneplanetsummit.fr/en>

⁹² Sustainable Markets Initiative. (2021). Terra Carta. For Nature, People and Planet. Retrieved from <https://www.sustainable-markets.org/terra-carta/>

03.7 How to prevent the introduction of invasive alien species

Not all alien (non-native) plants, animals and pathogens are invasive. But those that are invasive are costly. In the US alone, alien species cost the economy around 120 billion US dollars economic damage every year.⁹³ In short, they threaten food sources and entire ecosystems.⁹⁴

For example, insects like the brown marmorated stink bug have found their way into orchards worldwide from their native habitat in eastern Asia, damaging fruit quality before it can hit the market.⁹⁵ They may have been introduced accidentally. But humans have introduced other species deliberately, such as the destructive Cane Toad in Australia, hoping they would control pests like the cane beetle.⁹⁶

Humans play an important role in dispersing and controlling species. So what should we do? Preventing them from entering countries is the first and most powerful line of defense.⁹⁷ For example, you may have seen signs at airports reminding travelers not to transport plants, seeds or animals.⁹⁸ For shipping channels, this means enforcing rigorous monitoring and inspection programs.⁹⁹ Controlling the numbers of invasive alien species is the second line of defense. Methods to do this vary, depending on the pest and region. It's also vital to raise awareness about such species and how they might be dispersed.

Ideas:

- Support programs that prevent invasive species from entering countries, and eradicate those that have established themselves.
- When traveling abroad, take care not to import invasive species. For example, clean your shoes and don't bring plants with you.
- If you're a passionate fisher, avoid reusing the same lines. This helps avoid transmitting algae from one water source to another.

How philanthropists can prevent invasive alien species entering countries

Alistair Holt,
Head of Trusts and Foundations,
CABI, UK

"Protecting ecosystems from invasive alien species improves crop yields and secures food for vulnerable communities. It can even save an endangered species from extinction.

Worldwide, over 500 million smallholder farmers provide food for two-thirds of the earth's growing population. Achieving a zero-hunger world by 2030 means increasing the productivity of these smallholder farmers – but their crops face a significant threat. Every year, an estimated 40% of crops grown worldwide are lost to pests. If we reduced crop losses by just 1%, we could potentially feed millions more people. That's why it's vital farmers gain access to timely, appropriate and practical advice on reducing crop losses."

Dealing with invasive species on Gough Island

Mike Annison,
Head of Partnerships, RSPB, and
Andrew Callender,
Program Executive, Gough Island
Restoration, UK

"How can we overcome the challenge of invasive species?"

Islands make up only 5.3% of land worldwide. Yet 75% of all known terrestrial vertebrate extinctions have occurred on them. Additionally, islands are home to 37% of all critically endangered terrestrial vertebrate species – and we must protect them to preserve global biodiversity. Invasive non-native species are also thought to be responsible for 86% of all recorded extinctions on islands.

The solution? Island restoration – which is an essential and incredibly effective conservation tool. In 2021, the RSPB's Gough Island Restoration Program started eradicating invasive non-native mice from Gough Island. The island is a UNESCO World Heritage Site, part of the UK overseas territory Tristan da Cunha, and one of the world's greatest seabird colonies.

What risks do invasive species pose to biodiversity?

Islands are home to some of the world's most finely balanced ecosystems. Species most at risk from invasive species are those that evolve relatively isolated and have no natural predators. They have no defenses to the threats.

Humans accidentally introduced non-native mice to Gough Island, which devastated bird populations. Recent estimates indicate that mice are eradicating at least two million seabird chicks and eggs on the island every year, and are even starting to attack adult albatrosses. They are driving species to extinction.

How successful are removal programs?

Removal programs are effective. They have restored many hundreds of islands across the globe, with an 85% success rate for removing invasive mammals.

Since the RSPB's first successful island restoration 20 years ago, we've repeatedly achieved spectacular results. For example, on Lundy Island in England, seabird numbers trebled after eradicating black and brown rats.

But success isn't guaranteed. There are so many variables. Programs must remove every individual in the invasive species – or the population will recover quickly and cause similar damage.

So the best way to solve the problem is to introduce robust biosecurity measures that prevent alien species ever reaching islands in the first place.

How can philanthropists help?

By partnering with conservation organizations that are restoring islands. We're so grateful for the support of philanthropists and foundations. We couldn't have restored so many islands without them."

⁹³ U.S. Fish and Wildlife Service. (2012). The cost of invasive species.

⁹⁴ Department of Agriculture. (2010). Vegetable seeds policy review. Retrieved from <https://www.agriculture.gov.au/import/goods/plant-products/seeds-for-sowing/vegetable-seeds-policy-review>

⁹⁵ National Centre for Climate Services. (2018). Invasive Non-Native Pests: The Brown Marmorated Stink Bug. Retrieved from <http://www.nccs.admin.ch/nccs/en/home/sectors/landwirtschaft/impacts-pests/halyomorpha.html>

⁹⁶ Department of the Environment, Water, Heritage and the Arts. (2010). The cane toad (*Bufo marinus*) - fact sheet. Retrieved from [https://www.environment.gov.au/biodiversity/invasive-species/publications/factsheet-cane-toad-bufo-marinus#:~:text=Cane toads became pests after,continue to spread across Australia.](https://www.environment.gov.au/biodiversity/invasive-species/publications/factsheet-cane-toad-bufo-marinus#:~:text=Cane%20toads%20became%20pests%20after,continue%20to%20spread%20across%20Australia.)

⁹⁷ Invasive Species Centre. (n.d.). Investing in Prevention: Invasion Curve. Retrieved from <https://invasivespeciescentre.ca/learn/invasion-curve/>

⁹⁸ Department of Agriculture. (2010). Vegetable seeds policy review. Retrieved from <https://www.agriculture.gov.au/import/goods/plant-products/seeds-for-sowing/vegetable-seeds-policy-review>

⁹⁹ Epanchin-Niell, R. S. (2017). Economics of invasive species policy and management. *Biological Invasions*, 19(11), 3333-3354. doi:10.1007/s10530-017-1406-4

03.8 How to support sustainable food and fiber production, and their supply chains

Want to know more about the trends disrupting the food industry?

Check our [food revolution publication](#)

To reduce environmental harm, we need to rethink how we produce and consume the food we eat, the clothes we wear and their respective supply chains. This is true for food and any other industry.

We need to enhance sustainable supply chains and trade. Fair trade labels and certified organic food confirm that products have been produced in sustainable ways that treat employees and the planet fairly.

For example, you might support farming and processing systems that are viable in the long term. Helping producers adapt to change will also sustain their livelihoods and reduce environmental harm. Approaches include creating sustainable production, processing and distribution systems and, finally, retailing and end of life.

To combat climate change and biodiversity loss, it's also vital we shift our diets from meat and dairy products toward more plant-based foods. Additionally, we need to look at techniques used to produce and process raw materials, like cotton and viscose textiles.

Ideas:

- Support initiatives that promote smart farming in developing countries. For example, sustainable rice production using less water and chemicals; solar-powered micro irrigation, which enhances yields; and solar driers to preserve surplus crops.¹⁰⁰
- Engage with NGOs that support "Agriculture 4.0". Agriculture 4.0 is a more precise and efficient approach to farming. It uses science and technology to improve and protect the food value chain, and increase agricultural yields. It also involves technologies that protect crops, and sustainable food packaging, such as bioplastic.
- Raise awareness about the problem of food waste, and engage in campaigns to reduce food loss and waste along the entire chain of food production.
- Support organizations that advise corporates and entrepreneurs on sustainable supply chains, and certified producers who treat their employees and nature fairly.
- Support campaigns that encourage people to adopt sustainable eating habits.

Food for thought

Osnat Michaeli,
Co-founder and CMO, Infarm,
Germany

The current global food system's biggest problem is that producers are too far from the people they're trying to feed. The average distance between farms and stores is 2,500 km. Half of produce is wasted before it reaches our plates, while food that survives the journey loses much of its nutrients and taste.

Consumer demand for season-less fresh food also leads to depleted soil, chemical usage, water shortages and massive CO₂ emissions.

At Infarm, we want cities to become self-sufficient food producers. Our agriculture is resilient, sustainable and benefits the planet – making fresh, pure, tasty and nutritious produce available to everyone. So we've redesigned the entire food supply chain from start to finish. We don't build farms outside the city. We distribute farms throughout the city, close to the people who consume it.

Every farm is connected online on the cloud through our central farming "brain": a first-of-its-kind self-optimizing farming network that monitors growth and optimizes the growing environment. Our modular approach to farming is more sustainable than industrial agriculture because it:

- uses 95% less water and 75% less fertilizer than soil-based agriculture
- saves thousands of kilometers' travel by not shipping from abroad
- doesn't pump harmful chemicals into the soil or groundwater.

So far, we've saved more than 40 million liters of water and 50,000 square meters of land, compared to conventional crop farming. Every month, we harvest 500,000 plants, and this figure is growing. We're aiming to be a zero-emission food producer by 2021. Even today, 90% of the electricity we use comes from renewable sources.

The COVID-19 pandemic highlighted the fragility of our current food system. Modern agricultural production is built on a food supply chain that's vulnerable to ecological and supply shocks. As the planet loses more natural ecosystems and soil degrades further, it's vital that we create a sustainable, resilient and secure food system.

We now have the technologies and consumer support we need to succeed. We need to act fast, but we're moving in the right direction.



¹⁰⁰ UNEP. (n.d.). Smart agriculture in action. Retrieved from <https://www.unenvironment.org/news-and-stories/story/smart-agriculture-action>



Making fashion more sustainable

Nicole Rycroft,
Founder and Executive Director,
Canopy, Canada

“How can companies make their supply chains more sustainable?”

At Canopy, we help companies avoid the risk of having ancient or endangered forest fiber in their textiles, papers and packaging. To do that, companies need to state their environmental objectives in a clear policy and communicate it consistently to their suppliers.

Brands are uniquely placed to influence the sourcing practices of suppliers and the behavior of citizens. They should work with a trusted NGO to learn about the issues and maximize their impact. If lots of brands show they won't tolerate materials from high-carbon, biodiverse forests – and that they want to replace them with next-generation greener paper and textiles – supply chains will have to adapt.

Every year, over 3.2 billion trees are cut down to produce paper-based packaging and viscose textiles. Much of this comes from high-carbon forests and endangered habitats. Producers and retailers can benefit from trends towards resource-efficient material designs and low-impact alternatives to conventional forest-based products.

What developments do you see happening over the next five to ten years?

There are now many game-changing technologies that produce viscose fabrics, and paper and packaging products, with low-footprint alternatives to wood. These next-generation solutions use fiber from agricultural residues such as wheat straw, microbial cellulose grown on food waste, and cellulose from used cotton garments that would otherwise go to landfill.

Over the next decade, these low-impact alternatives, coupled with increased recycling, will supplant 50% of wood fiber being pulped globally. This will be driven by market demand from major brands, and investments aimed at reducing carbon emissions.

To protect the remaining forests, how quickly must companies change?

Scientists have shortened the timeline for climate action to 2030. So this is the decade where things need to turn around. Over the next ten years, we must protect 30% to 50% of our world's forests. Companies must shift their supply chains away from ancient and endangered forests, and switch to next-generation solutions.

This may seem daunting. But Canopy's work with the fashion industry has seen its supply chain transform in years – not decades. In just seven years, 52% of the global viscose supply chain is now at low risk of sourcing from ancient and endangered forests. Everything's possible when we work together.

What else do we need to do?

The world needs to build next-generation mills and recycling infrastructure on a huge scale. This requires a focused investment strategy. At Canopy, we've worked out that transforming the pulp supply chain will require a 69 billion US dollar investment deployed globally over the next decade.

We won't achieve our goals if every game-changing technology takes three or four years to raise capital. To build the first 10 to 15 commercial next-generation mills by 2023, we need to kickstart global investment now.”

03.9 How to support environmental education and research

The more we understand our ecosystems, the more we learn how to protect them. A scientific approach is fundamental to sustainable development. Education is also a great way to change behavior. For example, education can teach children about best environmental practice and sustainable consumption, and help them understand and appreciate nature.¹⁰¹

Research is vital for biodiversity and climate work. To make better decisions, we need to provide access to proven scientific data and observations. Equally, to achieve the UN's Sustainable Development Goals, we need to promote international research, collaboration, training and development.

Scientists and research institutions need more support bridging the gap between research and new government policies.¹⁰² Research agencies must work together to make the most of their resources and maximize results. These results will inform policies, programs and practices – and ensure research underpins everything we do.

Investing in research might seem unglamorous compared to practical solutions like tree planting, solar plants or nature reserves. It can also seem risky. What if the findings aren't what we expected? But research is vital. It's the foundation of all our efforts to create a sustainable world. To help you decide where to focus your efforts, it's worth looking at research in your area of interest.

Ideas:

- Help develop and introduce environmental education into school curriculums, and to educate decision-makers and policymakers.
- When funding research, identify the research gaps that still need addressing; read reports, research and publications in your field of interest; network and consider supporting multidisciplinary consortiums.



Learning lessons on biodiversity

Richard Hartung,
Treasurer, Roots & Shoots Lead,
and Finance Lead at the
Jane Goodall Institute, Singapore

“What are the benefits of teaching young people about biodiversity and the environment?”

Inform and empower young people, and they can change the world. An environmental education program can provide them with the support, insights and tools they need to lead the way. For example, the Roots & Shoots program equips young people with the leadership, team-building and critical-thinking skills required to become agents of change. They can put that knowledge to work in their own environmental projects.

How does the Roots & Shoots program tackle the topic of biodiversity?

Students often don't realize how important biodiversity is. Even in a small country like Singapore, ecosystems provide water, breakdown pollution, stabilize the climate and much more. Learning how to protect biodiversity is an essential part of learning about the environment.

Roots & Shoots educates students on biodiversity through activities like eco-literacy training, workshops and videos.

What challenges did you face implementing Roots & Shoots? How did you overcome them?

We faced three challenges. First, students who have spent long days at school are reluctant to do more. So we've adopted flexible schedules and innovative approaches to engage them. Additionally, students have many choices on how they spend their free time, from social media and digital games to family activities and extracurricular activities. To bring students and peers into our programs, we worked with teachers to create a youth leadership program. Finally, we face a shortage of people and finance, so we're working with volunteers to bridge the gap.

How can philanthropists help?

Financial support is always extremely welcome. But philanthropists can also offer their time and talent to improve environmental education. They can boost resources and attract peers by attending events, giving talks and mentoring environmental leaders, for example. They can also offer their talent or their staff's skills in areas like finance, marketing, fundraising and technology.”

¹⁰¹ Otto, S., and Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour, *Global Environmental Change*, Volume 47, 2017, Pages 88-94, ISSN 0959-3780, <https://doi.org/10.1016/j.gloenvcha.2017.09.009>.

¹⁰² Independent Group of Scientists appointed by the Secretary-General, *Global Sustainable Development*. (2019). Report: The Future is Now – Science for Achieving Sustainable Development. Retrieved from https://sustainabledevelopment.un.org/content/documents/24797GSDR_report_2019.pdf

03.10 How to support environmental education and research

To overcome the challenges facing our planet, behaviors need to change. One of the first steps toward achieving this is to raise awareness – locally, nationally and globally.

Ideas:

- Always use science-based facts. Finding and using accurate scientific data from recognized sources will help you make credible points and avoid spreading false messages.
- Use various types of media. Financing a documentary, cartoon, or publication about environmental problems can educate the public while attracting media attention. A well-planned distribution and media strategy will also make your efforts more successful.
- Empower the young. Funding programs targeted at children can help them connect with nature, either physically or through virtual reality. Such programs are even more impactful when part of an official school curriculum. The earlier children are encouraged to act, the more good habits they develop. Children are also great at bringing those good habits home.
- Partner with a celebrity or brand. A great way to capture people's attention is through popular brands and celebrities. Celebrities have cultural capital and can influence and engage people. For example, Sir David Attenborough has brought nature into the living rooms of millions of people. Additionally, Jackie Chan and Yao Ming have campaigned widely against ivory and rhino horn trafficking.

Michelle Yeoh,
actress, UNDP Goodwill Ambassador,
and #TOGETHERBAND Ambassador
for Goal 15, China

“Goal 15 is about taking urgent actions to halt deforestation and reduce a loss of natural habitat and biodiversity, which are part of our common heritage and critical for our future.”

Doutzen Kroes,
model, actress and #TOGETHER-
BAND Ambassador for Goal 15,
the Netherlands

“I decided to partner with #TOGETHERBAND because I want to do as much as I can to raise my voice for environmental causes. But I think we need to collaborate and work together. The more we can do together, the better. We only have 10 years to save our planet, so we all need to raise our voices and fight.”

How to build an awareness campaign:

Step 1

Define your desired outcomes. Having a clear idea of what success looks like will help you stay focused and measure your progress. Before the campaign launches, establish key performance indicators (KPIs). You can base these on such factors as awareness, social media engagement or even a fundraising target.

Step 2

Identify your audience. The most effective campaigns gain awareness by focusing on a narrow group of people at the start. Segmenting your audience, for example, by age, interests, occupation and income, will help you adapt your messages and activities. Be prepared to adapt your audience should there be a shift in the economy or social trends. To stay ahead, observe your competitors and be ready to change.

Step 3

Identify the resources you need. Some campaigns require a lot of resources. Money isn't the only resource you will use. For example, you may need access to specific media, sources of expertise, and importantly, time. Mapping your resources and budget will help you identify your gaps and needs, such as, funding. At this stage, you might start identifying a partner who can complement your efforts.

Step 4

We're exposed to up to 10,000 advertisements a day, so make sure you choose the most effective channels to capture your audience's attention.¹⁰³ The channels you use will depend on your strategy, budget and target audience. Depending on your target audience, using a blend of online and traditional channels will probably be best. Digital channels allow you to reach more people at a lower cost. Traditional channels can add great value, but they're more expensive.

Step 5

Build a network around you and map out their roles and responsibilities. In most cases, you won't be able to do everything yourself. Depending on your budget, you may have to rely on staff, suppliers and agencies. If you have staff, make sure everyone knows their roles and responsibilities. Communication is key, and managing stakeholders is a big part of maximizing your return.

Virtual reality and biodiversity

Saskia Kress,
CEO, Filmtank and the Interactive
Media Foundation, Germany

“Virtual reality (VR) is an empathy machine that changes perspectives. In our internationally awarded VR project, “Inside Tumucumaque”, people experience what it feels like to be a tarantula in the Amazon, and see the world through a spider's senses. With the help of ultraviolet color spectra, super slow motion, visualizations of sonar location, color night views and spatial 3D sound, VR makes animal perceptions comprehensible to humans. Through this unique perspective, visitors gain a deeper understanding of why we need to bring the relationship between humans, animals and nature back into harmony.”

¹⁰³ Forbes. (2017). Finding Brand Success In The Digital World.



04 Looking beyond traditional philanthropy

In the race to protect the planet, individuals and funds are acquiring large areas of land to safeguard and restore. But much of the world's land is already owned, so there are limits to this approach. Instead, investors are increasingly looking to fund conservation programs that protect ecosystems. Traditionally, environmental programs have operated on a small scale and struggled to attract support from philanthropists and investors.

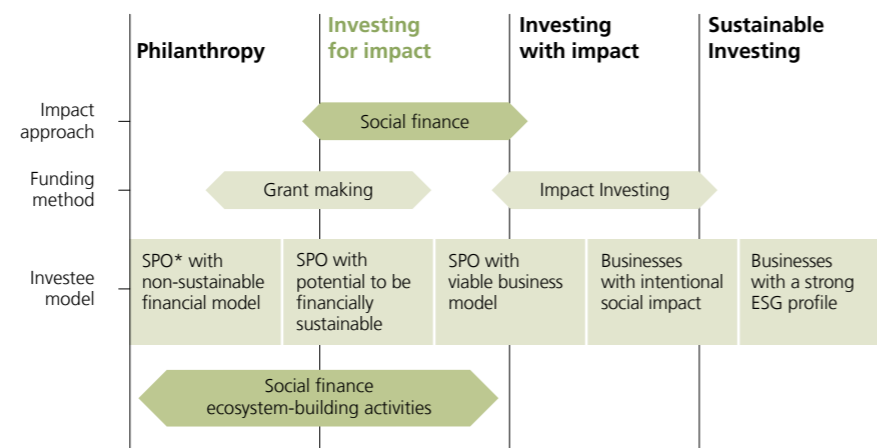
That's why data is vital for investing in the environment. Measuring environmental results and tying them to underlying revenue sources such as carbon credits, agricultural or forestry products or services is essential for ensuring programs and investments are sustainable. There is much to learn from the social sector, which has a longer history of measuring results and tying them to funding.

04.1 Innovative financing solutions

Investors have an appetite for financing products, particularly if those products preserve wealth. Environmental programs often have a long-term goal and require long-term financing. That's where new financing solutions are needed. This doesn't necessarily require new tools. Instead, existing tools can be used in new areas. For example, venture capital-type investments can support profitable business concepts while providing measurable results.

Blended finance is one approach to scaling up venture capital-type investments. It uses capital from public or philanthropic sources to increase private sector investment in the environment. This enables philanthropic funding and fund programs to achieve much more.

Social finance: putting impact first



*SPO: Social Purpose Organization

Source: Partly adapted from EVPA (2018). Impact Strategies – How Investors Drive Social Impact.

Scaling up programs successfully requires professional financial management, expert support from NGOs and researchers, and efficient and reproducible implementation. What's more, it's vital that local communities can participate in the programs and benefit financially from them.

At the start, it's important to test profitable and measurable business models that can be scaled up, particularly when there's an opportunity to enjoy investment returns. Once established, such successful programs can ignite interest and similar initiatives worldwide.

How to make programs ready for investment

Fabian Huwylar,
Managing Partner, Posaidon Capital,
Switzerland

- Help programs acquire data, to demonstrate their value or help project managers make the right decisions. Proving the benefits of a project currently involves slow and demanding manual work. Some start-ups and associations, like The Crowther Lab at ETH Zurich, are developing ways to collect data quickly and efficiently. This helps project owners report on progress, provide auditable data, and identify issues, like illegal logging or fires, more quickly.
- Support incubators (organizations supporting start-up projects). Too many good projects die after one or two years, because they lack knowledge and resources. Incubators (like Hatch and Catapult) provide projects with technical support, networking opportunities and advice on raising funds. When business models prove successful, incubators can then help replicate them on a wider scale.
- To amplify your impact, don't fragment your activities. Pick an issue or location and work on it as a whole. Support projects that can approach the issue from different angles – and you'll multiply the chances of solving it.



How to attract more capital

Holger Schmid,
Program Director Sustainable
Economy and Switzerland,
MAVA Fondation pour la Nature,
Switzerland

“Why does biodiversity fail to attract large-scale (commercial) investments?”

Biodiversity isn't valued adequately in private and public financing decisions. Often, the cost of doing harm to biodiversity and nature is overlooked. This is a widespread problem that undermines the potential for a scalable commercially viable investment model that can positively impact nature.

There are limited exceptions, such as environmental service schemes that provide water and control floods.

How can we attract investment into biodiversity and nature-based solutions?

Investors need to feel confident in the investments and get an acceptable return. To build this confidence, it's important to establish a track record of well-performing nature-based solutions across different geographies. Advanced systems modeling and comparing nature-based versus technical solutions can help to establish a basis for comparison. Public finance can also step in at an early stage. But markets need to start internalizing the costs and benefits of nature through better legislation and extended liability.

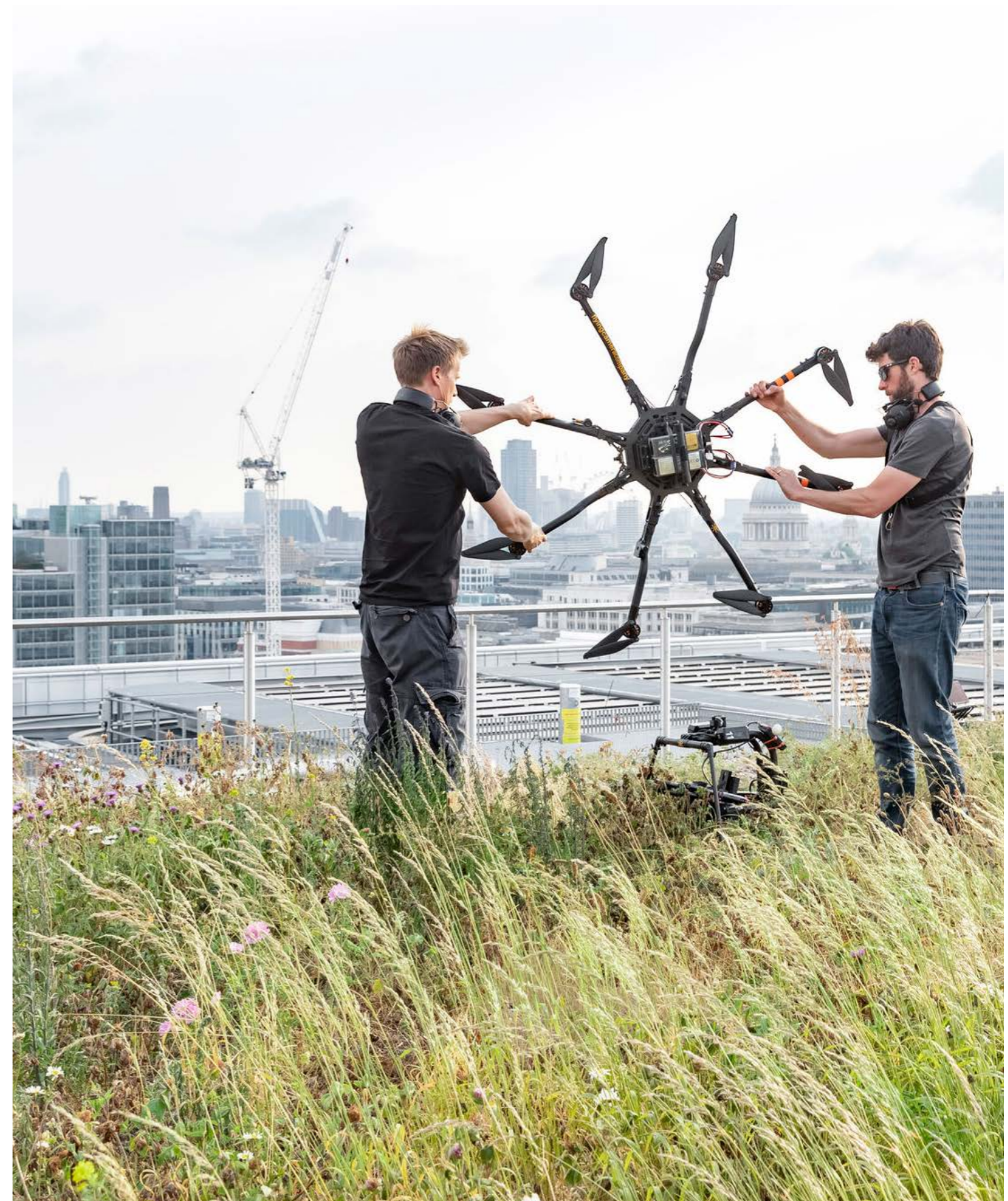
What role can philanthropy play?

Philanthropists can invest in developing new policies that reflect those goals and unlock large commercial investments.

Addressing SDG 15 is a huge challenge. We need to think big and systemically, and design large-scale solutions. We can drive change by moving away from small-scale programs, acting in one possible field of action at a time, and advancing efficiency through standards, shared methods and innovation.

What does success look like?

I would define success as biodiversity enhancing activities that are viewed as investments, not costs. If we start to understand that supporting nature is an investment for our collective future, we will see profitable business models and positive outcomes for nature.”



Holger Schmid,
Program Director Sustainable Economy
and Switzerland, MAVA Fondation
pour la Nature, Switzerland

“Philanthropy needs to move away from overly investing in direct remediation, and find its role as an enabler for larger investments and more fundamental systemic changes.”

An innovative financing solution for fighting deforestation

Kevin Juma,
Africa Forest Strategy Director,
The Nature Conservancy (TNC),
USA

“What is the Africa Forest Carbon Catalyst (AFCC) and how does it work?”

The AFCC is a blended finance approach to conserving and restoring forests. It finds and supports sustainable and profitable forest-related enterprises and projects, and prepares them for investment. From there, it harnesses blended finance to deliver the projects at scale.

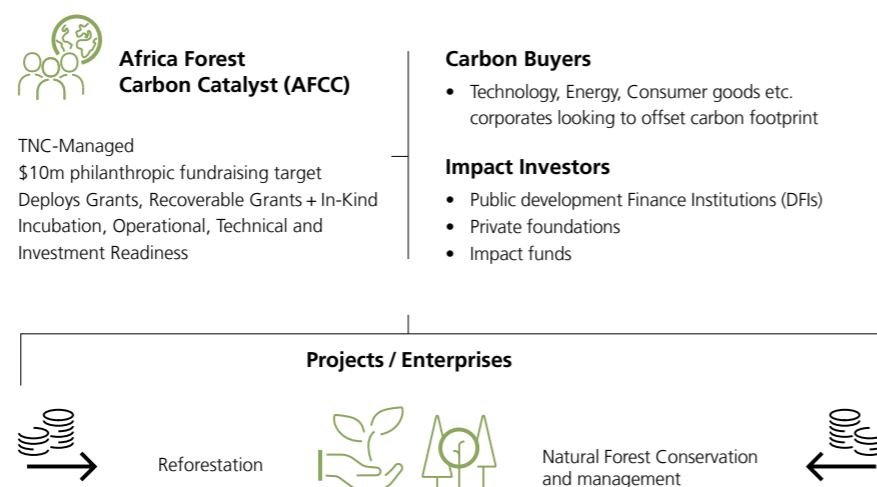
What challenges have you faced when implementing new financing models? How did you overcome them?

One of the biggest challenges has been finding enough high-quality bankable forest conservation and restoration projects in Africa to absorb the large sums pledged by the private sector. Historically, projects have been small and unable to meet the terms private sector investors seek. But now, the AFCC is supporting forest projects and enterprises that can provide investors with triple-bottom-line returns (financial, social and conservation).

How can philanthropists help?

Visionary philanthropists can play a powerful role in funding early-stage projects, helping them prepare to receive the investments they need to grow.”

How the African Tree Fund development facility and investment facility will work together.



Source: Provided by the Nature Conservancy, (2020)

Global Canopy – attract investment in sustainable land use

Niki Mardas,
Executive Director, Global Canopy,
UK

“What does Global Canopy do? What challenges did you overcome?”

Global Canopy focuses on a big issue: how global trade and finance contribute to the climate and nature crisis, and the priority actions to reverse this.

For example, the biggest cause of tropical deforestation is increased agriculture for commodities like soy, palm oil, beef and timber. Every six seconds, people clear a football field-sized area of tropical forest to grow commodities that could be produced sustainably.

These commodities end up in over half the products in supermarkets. They’re in our food and footwear, but also our investments and our pensions. We’ve all become disconnected from the origins and impacts of what we consume.

It’s a crazy situation – but also a huge opportunity to turn things around.

Global Canopy data shows how companies and investors are linked to huge environmental harm, and where the best opportunities lie for positive action. Our work enables leaders to act, for instance by identifying new models for sustainable investment. And it shines a light on those not doing enough. Our Forest 500 rankings, for instance, identify financial institutions without any policies on deforestation, that currently provide 2.8 trillion US dollars in finance to exposed companies.

Investment ratings agencies now need to use this data. Companies need to bake it into their environmental, social and governance (ESG) measurements, which are dismal when it comes to impacts on nature. Is the data perfect? Not yet. But it’s good enough and improving fast.

The real challenges to change are political. Can an 800-pound gorilla of global finance turn on a dime? Yes, if we all make it our mission.

How can we attract investment into sustainable land use?

Nowhere is the climate and nature crisis playing out more starkly than the lands where agriculture is expanding into tropical rainforest. It’s vital we scale up investment into sustainable land use and restoration. But it’s also complex and risky.

Philanthropists can play a key role in reducing these risks through solutions such as first-loss guarantees (where the philanthropist guarantees to pay for losses if the borrower defaults, so lenders feel more confident providing loans). A philanthropic investment of two million US dollars in an accelerator fund can help leverage twenty times that value in private sector capital. It could even yield a decent return.

Another opportunity for philanthropists is to provide technical assistance, for example, training farmers in agroecology (sustainable farming). This support can result in more diverse and healthier crops, better carbon and water uptake, and lower production costs (and pollution) through not using chemical fertilisers.

We are now transforming our food systems. It won’t be easy. But by getting involved, philanthropists will have a front row seat for one of the world’s greatest growth areas.”

What to consider when investing in SDG 15

Katherine Stodulka,
Director, Blended Finance Taskforce,
SYSTEMIQ, UK/Indonesia

“Which nature-related sectors are most attractive to investors?”

At SYSTEMIQ, we polled around 100 investors. They said that the SDG 15 sectors that are likely to attract the most investment in 2021 were:

1. Carbon credits: 53%
2. Regenerative agriculture: 43%
3. Urban farming: 20%
4. Nutritious diets: 18%
5. Rural infrastructure: 15%
6. Reducing food loss and waste: 10%
7. Healthy oceans: 5%

How can philanthropists help develop and scale new investments?

We must avoid reinventing the wheel and learn from today's success stories. Replicating what works is the only way to scale fast enough. This means standardizing frameworks for financial products, disclosing climate and nature-related risks, and combining small-scale projects to make them more investable.

We need to:

- reduce real and perceived risks of investing in SDG 15, using public and philanthropic capital in a smarter way to unlock new markets and prove that nature-positive business models are viable
- strengthen data, climate modeling, physical & transition risk assessment and impact measurement to demonstrate the financial risks of a four-degree global temperature rise on food and agriculture investments
- highlight the broad range of investment opportunities of a more sustainable food and land use system
- accelerate SDG 15 investments by reducing transaction costs; working with financial intermediaries to build a pipeline of scalable projects; strengthening relationships with local partners; channeling money where it's most needed; and capturing the value of regenerative solutions in ways that value nature, support societies and drive lasting change.”



04.2 Investing for good

Besides investing directly in projects, you can help protect all life on land through blended finance approaches and other philanthropic activities. These are some of the opportunities available to investors.

Sustainable farming and agriculture

The world's food system needs to produce huge amounts of nutrition-packed food. But the current system may not be able to feed everybody in the coming decades.

Traditional farming and business practices must transform to become more sustainable. Digital solutions are playing a huge role in this. But, some farms, particularly those in remote locations and developing countries, lack reliable data networks to connect with such solutions. New agricultural models are also emerging, for example, cultured protein, indoor farming, regenerative farming systems and high-tech aquaculture.

It's vital to incentivize land managers to remove carbon from the atmosphere (carbon sequestration). We also need a reliable global carbon accounting system to measure their success, and companies helping farmers operate sustainably with natural and digital solutions.

Investment ideas:

- Agriculture technologies, including precision agriculture, which raises output while minimizing environmental impact.
- Irrigation technologies, which enhance farmers' decision-making.
- Water-efficiency solutions that combine sensors, drones, big data, satellite connections and robotics.
- Alternative protein development.
- Systems to measure soil carbon and the positive impact of nature-based solutions.¹⁰⁴



Water scarcity

Challenges like unsustainable population growth, resource-inefficient agriculture, urbanization and industrialization have depleted global water resources and degraded the natural environment. The United Nations estimates that, if this imbalance isn't addressed, 45% of global GDP, 52% of the world's population, and 40% of global grain production will be at risk or compromised by 2050.

Investment ideas:

- Smart irrigation technologies for agriculture.
- Companies that conserve and restore water ecosystems, natural habitats and biodiversity.
- Water-recycling technologies that preserve and minimize demand for natural water resources.¹⁰⁵

Biodiversity

The World Economic Forum's (WEF) 2020 Global Risks Report ranked biodiversity loss as the second-most impactful and third-most likely risk for the next decade. Nature loss matters for most businesses because it affects raw materials, supply chains and operational resources. For example, many therapeutic drugs are derived from plants, animals, fungi and bacteria, so biodiversity is essential for developing new medicines. Globally, bees and other pollinating animals pollinate 71 of the 100 most commonly used crops – which deliver 90% to 100% of nutrition. Extinctions threaten the industry that feeds the planet and generates nearly 3% of its global GDP.

Investment ideas:

- Technologies and companies addressing pollution control, water quality and availability, renewable energy, waste management and sustainable agriculture.
- Dedicated multilateral development bank (for example, World Bank) bonds that aim to conserve biodiversity.

¹⁰⁴ UBS Chief Investment Office. (2020). Longer term investments. The Food Revolution.

¹⁰⁵ UBS Chief Investment Office. (2019). Longer term investments. Water Scarcity.

How to invest in forests

Stephan Winkler,
Chairman, Empresa Forestal e
Industrial (EFISA), Paraguay

I grew up playing in forests as a child, and love being among trees. I learned through play that trees are a beautifully versatile natural resource: they provide shelter, toys, tools, decoration, fire – and air! As I grew up, I saw how quickly these forests were disappearing. But I also saw a solution: investing in sustainable commercial tree plantations. This isn't just an ecologist's fancy. Such investments make sound financial sense, both for generating income and reducing risks in investment portfolios over the long term.

When done correctly, commercial reforestation is the single best way to ease pressure on the world's remaining natural forests – while combating climate change by removing carbon from the atmosphere. The greater the world's stock of reforested timber, the less we need to exploit our forests. Although investors have been able to access forestry as an asset class for a long time, many have overlooked them. Why? Because they think they need to invest a lot of money to get involved, and that they'll need patience to see a return. Neither is necessarily true anymore.

The best way to contribute to reforestation is to invest in a piece of land, choose a local forest manager, and establish a plantation. It's that simple. From there, you can consider your other goals. Are you looking for high investment returns? Would you like to maximize sequestration? Do you want to promote biodiversity, wildlife habitats or clean water? These goals are often linked. But knowing what you're aiming for will guide everything you do, from choosing a location, to deciding on species to plant and picking the right rotation period.

If you're planting for commercial purposes, always consider your market first. Where is your wood going to go in 6, 12 and 20 years' time? Choose a local forest manager with a couple of rotations' worth of experience.

Don't cut corners. Plantations fail when owners ignore important stages of preparing and managing them in favor of short-term needs. Finally, don't try to reinvent the wheel. If you see something that's worked well, copy it.

Trees are a long-term project, and they don't move, so think local. When investing in forests, only do it somewhere you love, where you like the people and the culture; where the nature and views excite and inspire you; and where you can really enjoy yourself. That way, you'll gain much more from your investment than you could ever measure in money. You'll find, after a while, that you have created something that speaks to your soul.



Making nature investable

Antoine de Kermel,
Director of Regenerative
Programmes, ReGen Future
Capital, UK

“What financing models are proven to support SDG 15?”

While I applaud support for protecting the environment, investments in SDG 15 tend to be reactive. Yes, it's heartening to see corporate sectors like food and fashion engaging with agricultural supply chains. There's evidence that production quality, farming and ranching practices, and supply chains are improving. But it isn't enough.

What needs to happen now? Firstly, governments must introduce strong policies with penalties that give companies no choice but to comply. Secondly, we need new impactful, profitable and scalable business models that are attractive to institutional and private investors.

At ReGen Future Capital, we've developed a “regenerative finance” model – where profits and assets from, say, solar and wind energy, go to fund regenerative projects. It addresses the needs of long-term investors without losing sight of the big picture. Regenerative finance provides a safe and profitable environment for large infrastructure investors. It also generates a flow of funds for projects, rather than the usual one-off grants.

Project developers and entrepreneurs must rethink their models and make their ventures more investable. This means switching to more economically viable regenerative management practices, and integrating revenue from ecosystem services like biodiversity, regeneration, and water quality.

What challenges have you faced finding funding for nature-based programs? How have you overcome them?

For many investors, this is unknown territory. They're not familiar with nature-based assets and programs. But now, we're working with nature using familiar terms like profit and returns. New business models are often based on paying for ecosystem services, specifically carbon.

To make sure SDG 15 funding succeeds, we need to structure schemes and standards consistently and transparently. While investors like short-term gains, pension funds with 20 to 25-year investment timeframes sit comfortably with nature-based programs.

There are now many rewarding projects in regenerative agriculture, agroforestry and sustainable forest management. They're led by smart entrepreneurs focused on providing long-term gains through carbon markets and working practices that will become global standards.

A great example is agriculture and SDG 15 funding. Previously, it's focused on small-scale farming to secure food for all in emerging markets. Today, there's a huge opportunity to fund a smooth move from conventional agriculture to more regenerative practices. Such practices can go a long way to conserving and regenerating nature and biodiversity, and solving the climate crisis.”



Andrew Lee,
Head of Sustainable and
Impact Investing, UBS Global
Wealth Management, USA

“Investors play an important role in addressing the negative impacts of climate change and human activity on our habitat, whether directly or indirectly. We see an increasing number of private investors who want to understand the positive social and environmental impact their invested capital can generate. Investors who indicate a preference for preserving land and biodiversity can choose investments that support sustainable agriculture, aquaculture and forestry, while generating competitive financial returns. They can also invest in technologies that reduce waste, preserve water, prevent deforestation and more.”





05 Working together

Traditional efforts to solve the issues facing our planet are often fragmented and short-term. Only by working together will we create a new system that can tackle the complex challenges.

We need to understand those issues and what's causing them. Because unless we deal with the root causes, we'll always be trying to solve issues in malfunctioning systems – and nothing will change.

Together, we need to change the system for good.

Ways to make a bigger impact

1. Understand the big picture by:

- identifying how the key players and structures currently operate, and how they might work together
- assessing how each player can change the system
- exploring whether they want to maintain or change the system
- checking if someone has already responded successfully to the problem – and whether you could replicate and build on what they've done.

2. Start changing the system by:

- bringing players together to plan a new strategy and actions
- changing processes to achieve your goals
- making sure everyone involved is jointly accountable for achieving goals and advocating solutions.

The power of collectives

Collectives are groups of key players from different sectors working together to solve issues on a big scale. Here's how you can get involved.

Join a collective that already exists. Starting a new collective isn't always the quickest, easiest or best approach. Many quality alliances already exist. So why not join forces with them? This allows you to:

- get the most from their resources and expertise
- invest in scaling up solutions that have already proven successful.

Take part in collective philanthropy. This enables you to:

- achieve more with your money, because it's pooled with other funds and more powerful – it can also reduce your reporting duties
- feel confident you're investing in quality projects – because collectives more effectively find and assess projects, and measure their impact
- exchange views and insights with others, which can guide your future giving
- better manage risks, compared to acting alone in a new area – there's also less chance of people duplicating their efforts
- feel sure that everyone involved is accountable for, and committed to, achieving the goals.

The five key ingredients to successful collectives

1. **Common agenda** – everyone shares and understands the same goals.
2. **Strategic learning** – the collective shares measurements and insights, so everyone learns and makes better decisions together.
3. **Mutually reinforcing activities** – the collective shares everyone's skills and talents.
4. **Strong and trusted engagement with stakeholders** – by creating strong relationships with partners, everyone can work together to achieve the same goals.
5. **Backbone support** – dedicated staff who can challenge and coordinate the different participants.



Championing a new collective

You may want to champion a new project that tackles an issue in a place where a collective doesn't already exist. Here are some pointers on starting a collective:

1. Explore the issue and how ready you are to start:

- Find and recruit likeminded champions.
- Build a strong and trusted relationship with the local community.
- Create a plan to launch the collective.

2. Launching the collective:

- Create a steering committee to champion the effort.
- Identify key issues and gaps at the start, and measure your progress against them.
- Engage community stakeholders on your findings.

3. Organize for impact:

- Create a common agenda together, including the collective's vision, goals and ways of measuring progress.
- Review and test the common agenda with community stakeholders.

Develop strategies:

- Design the backbone of your collective (people who manage the collective and ensure participants are engaged).
- Create strategies for change, and form working groups for each change area.
- Devise an approach for sharing measurements and learning strategically.

Shloka Nath,
Executive Director, and
Amita Ramachandran,
Program Lead, India Climate
Collaborative, India

"How important are collaborations for achieving SDG 15?"

They're essential. No single person, government, business, organization can achieve the goal alone. Partnerships and collaborations will achieve much more, by making the most of collective money, time and talent. Working together, experts, practitioners, academic centers, advisories, and associations can significantly boost the impact of philanthropy.

The advantage of philanthropy is that it uncovers new ways of doing things. Philanthropists experiment and take risks. So when great minds come together, they're more likely to create innovations that become the blueprint for saving the planet.

What kind of collective action is best?

Pooled or aligned funding can achieve more than networks and knowledge-sharing collectives. Such funding is efficient and more able to grow, and helps raise awareness of the issues. There's recently been some big efforts to combine philanthropic funds. A number of funders have joined ambitious collaborations to invest significantly in SDG issues.

What should philanthropists look for in a partnership?

Partnerships help everyone involved develop strategies, find grantees, structure deals and measure progress. But the most important ingredient for any new partnership or collaboration is trust. Sharing power is risky. But, it can transform everything, as long as everyone agrees on the goals; a structure for sharing governance and operations; and a process for improving impact. When power is shared, power grows."





How collaboration accelerates innovation

Adrian Dellecker,
Head of Strategy and Development,
Luc Hoffmann Institute,
Switzerland

“What is the Beyond Tourism in Africa challenge?”

Beyond Tourism in Africa is a global innovation challenge set up as a partnership between the Luc Hoffmann Institute, the African Leadership University's School of Wildlife Conservation and WWF-Africa. It reaches out to innovators and entrepreneurs who need support and are passionate about solving the biodiversity crisis.

Conservation often relies heavily on tourism for revenue. We're looking for new ways for local communities in Africa to benefit from conserving wildlife, besides tourism.

What challenges did you encounter?

Each partner had to learn how to play to their strengths while acknowledging their weaknesses. But it worked because everyone engaged, recognized their blind spots, and trusted each other to deliver. The challenge brought everyone's complementary skills together – and the outcomes have been inspiring.

Why is it so important for philanthropists to engage with local communities?

Human wellbeing is an essential part of conservation. Local and indigenous communities are important stewards of nature. They face real challenges living near wildlife, for example, trampled crops and killed livestock. These challenges can ruin people's livelihoods.

So local communities must benefit directly from efforts to conserve nature. One condition for the challenge was that entrants' ideas had to protect communities' rights, dignity and livelihoods; and enable them to make decisions.

How does collaborating foster innovation and new solutions?

No one person or organization has all the answers. The best collaborations are between those with different networks and backgrounds. That's where true innovation comes from. It can be hard working with people who think differently. But it's the best way to take us out of our echo chambers, and drive deep and lasting change.”



Photo: Stuart Clarke

Dr. Jane Goodall
DBE, Founder of the Jane
Goodall Institute and
UN Messenger of Peace

“As we look around the world today – at the conflicts, the destruction of the environment, the human and animal suffering – it almost seems absurd to say that my wish is for a more peaceful, healthier and happier world. Yet this is the world we all yearn for. With the image of such a world in my mind and in my heart, it is easier to take action, every day, to move things in the right direction. Of course, the road is long and full of disappointments but still it gives me energy to keep going with that goal in sight. Without hope there is no hope.”

06 Where next?

Biodiversity is at the heart of a healthy planet. Without it, every living organism on Earth would perish. The need to protect and restore this precious source of life has never been more pressing.

So now it's over to you. As a philanthropist or an investor, you can roll back decades of deforestation, pollution and climate change. Start by discovering what resonates with you. Explore the issues. Connect with like-minded people. Forge alliances. Take your mission to the world.

No one's saying it will be easy. A better environment won't happen overnight. The issues and challenges are too entwined to untangle in just a few years. But with time, patience and passion, you'll succeed. Rest assured, there will be many kindred souls keen to join you on your journey.

Imagine, just for a moment, how you might revitalize the world's biodiversity and protect all life on Earth.

Surely that's a cause worth fighting for.

To find out more about how you can protect and restore life on land, please contact sh-philanthropy@ubs.com.

Thank you

We are grateful to the experts, colleagues and clients who shared their insights and perspectives for this publication.

Special thanks go to:

- **St. John Anderson**, Co-founder and Director, Carbon Tanzania, Tanzania
- **Mike Annison**, Head of Partnerships, Royal Society for the Protection of Birds (RSPB), UK
- **Sir David Attenborough**, Vice President, Fauna & Flora International, UK
- **Evan Axelrad**, Manager Business Development, One Acre Fund, Kenya
- **Jess Ayers**, Director Climate Change, The Children's Investment Fund Foundation (CIFF), UK
- **Garo Batmanian**, Global Lead for Forests, Landscapes, and Biodiversity, The World Bank, USA
- **Olivier Behra**, Founder, Net Positive Impact program, France
- **Andrew Callender**, Programme Executive, The Gough Island Restoration, UK
- **Antoine de Kermel**, Director of Regenerative Programmes, ReGen Future Capital, UK
- **Adrian Dellecker**, Head of Strategy and Development, The Luc Hoffmann Institute, Switzerland
- **Dr. Abigail Entwistle**, Director of Science & Design, Fauna & Flora International, UK
- **Arent Fock, Chairman**, African Parks Foundation Switzerland, Switzerland
- **Dr. Jane Goodall**, DBE, Founder of the Jane Goodall Institute and UN Messenger of Peace
- **Gemma Goodman**, Head of Conservation Programmes, Synchronicity Earth, UK
- **Richard Hartung**, Treasurer, Roots & Shoots Lead, and Finance Lead, The Jane Goodall Institute, Singapore
- **Alistair Holt**, Head of Trusts and Foundations, Centre for Agriculture and Bioscience International (CABI), UK
- **Nicole Honegger**, Founder, Leopardess Foundation, Switzerland
- **Fabian Huwyler**, Managing Partner, Posaidon Capital, Switzerland
- **Kevin Juma**, Africa Forest Strategy Director, The Nature Conservancy (TNC), USA
- **Marat Karpeka**, Founder, The Marat Karpeka Lemur Foundation, USA
- **Saskia Kress**, CEO, Filmtank and the Interactive Media Foundation, Germany
- **Doutzen Kroes**, Model, actress and #TOGETHERBAND Ambassador for Goal 15, the Netherlands
- **Cath Lawson**, Regional Manager for Africa Conservation Programmes, World Wide Fund for Nature (WWF) UK
- **Andrew Lee**, Head of Sustainable and Impact investing, UBS Global Wealth Management, USA
- **Christian Leitz**, Head of Corporate Responsibility Management, UBS, Switzerland
- **Eufrazio Maratas Jr.**, Executive Director, RISE, Philippines
- **Niki Mardas**, Executive Director, Global Canopy, UK
- **David Meyers**, Executive Director, Conservation Finance Alliance, USA
- **Osnat Michaeli**, Co-founder and CMO, Infarm, Germany
- **Dr. Suzan Murray**, Program Director of the Global Health Program and Chief Wildlife Veterinary Medical Officer, The Smithsonian National Zoo and Conservation Biology Institute, USA
- **Shloka Nath**, Executive Director, The India Climate Collaborative, India
- **Dr. David Neidel**, ELTI Asia Program Advisor, World Agroforestry Centre, Philippines
- **Suzana Padua**, President of the Institute for Ecological Research (IPE), Brazil
- **Amita Ramachandran**, Program Lead, The India Climate Collaborative, India
- **Nicole Rycroft**, Founder and Executive Director, Canopy, Canada
- **Bastien Sachet**, CEO, Earthworm Foundation, Switzerland
- **Holger Schmid**, Program Director Sustainable Economy and Switzerland, MAVA Fondation pour la Nature, Switzerland
- **Wes Sechrest**, CEO, Global Wildlife Conservation, USA
- **Katherine Stodulka**, Director, Blended Finance Taskforce, SYSTEMIQ, UK
- **Shara Ticku**, CEO and co-founder, C16 Biosciences, USA
- **Dr. Amy Vedder**, McCluskey Fellow and Lecturer, Yale University, School of Forestry and the Environment, USA
- **Felicitas von Peter**, Founder and Managing Partner, Active Philanthropy, Germany
- **Mike Watson**, CEO, Lewa Conservancy, Kenya
- **Darrel Webber**, Managing Director, Global Forest Strategies, Earth innovation Institute, USA
- **Stephan Winkler**, Chairman, Empresa Forestal e Industrial (EFISA), Paraguay
- **Dr. Mark Wright**, Director of Science, World Wide Fund for Nature (WWF), UK
- **Michelle Yeoh**, actress, UNDP Goodwill Ambassador, and #TOGETHERBAND Ambassador for SDG 15, China
- **Valter Ziantoni**, Founder, PRETATERRA, Brazil

About UBS

Changing the world needs leadership. As one of the world's largest wealth managers, at UBS, we want to lead the way to a better future – for ourselves and generations to come.

We believe people's desire to make the world a better place will continue to grow. People worldwide will increasingly seek to do good by choosing sustainable investments and philanthropic solutions. We are here to help you have more impact with your wealth.

Together, we will explore your purpose and help you make a difference with your wealth through giving, investing, connecting, and leading the change you want to see. We're recognized globally for our philanthropy services and expertise. With over 20 years' experience, we can help you and your family maximize your impact locally, nationally and globally.

We're proud to be among the founding signatories of the Principles for Responsible Banking (PRB) of the United Nations Environment Programme Finance Initiative (UNEP FI). The global framework specifies how banks must support a sustainable future. We were also among the first banks to shine a light on the United Nations' Sustainable Development Goals and what it takes to make them investable for clients. Today, we're always seeking to develop solutions that direct investments towards those goals.

Our philanthropic foundation, the UBS Optimus Foundation, now also focuses on environmental and climate issues. We've also launched UBS Collectives to help you connect with other philanthropists and take your solutions to the world. We cover the costs of running your collective, match investors' funding by 10%, and provide a deep learning experience over three years.

As with any investments, the value may fall as well as rise, and you may not get back the amount you originally invested.



To find out more about:

What we do as a firm:

ubs.com/insociety

How we can support you with your philanthropy:

ubs.com/philanthropy

How you can invest more sustainably:

ubs.com/si

What does UBS do to protect life on land?

Recognizing the risks associated with biodiversity loss and the economic value of ecosystem services, UBS has defined specific standards that seek to promote the protection of biodiversity at a global scale. UBS has identified and will not engage in certain activities that endanger animal species and contribute to deforestation and its related impacts. Our standards for controversial activities and areas of concern, as included in our environmental and social risk (ESR) policy framework¹⁰⁶, not only take into account deforestation and forest degradation but also other activities such as fisheries, which has an impact on marine species.

As loss of biodiversity is closely intertwined with climate change, this makes the transition to a low-carbon economy even more vital. UBS supports this transition through a comprehensive climate strategy. It underlines our commitment to the United Nations (UN) Sustainable Development Goals (SDGs) on climate action and on affordable and clean energy and supports an orderly transition to a low-carbon economy, as defined by the Paris Agreement.

UBS aims to be a leading financial provider in enabling investors to mobilize private and institutional capital to climate change mitigation and adaptation while supporting the transition to a low-carbon economy as corporate advisor, and/or with our lending capacity. And, equally, UBS recognizes the importance of mobilizing financial resources to conserve biodiversity and ecosystems. As one of the world's largest global wealth managers, we regard it as particularly critical to help private wealth contribute to fund the development of a more sustainable world.

Our concept of sustainability is guided by the SDGs. These bring together the enormous societal and environmental challenges the world faces. We recognize that it is important to understand these challenges as well as the opportunities arising from them, to consider their relevance to UBS and to identify potential actions our firm may need to take. Expressed most directly in SDGs 14 and 15 (life below water and life on land respectively), biodiversity is also a key element in or directly linked to other SDGs.

Supporting clients to act on biodiversity loss

UBS recognizes the importance of mobilizing financial resources to conserve biodiversity and ecosystems and helps clients wanting to shift their portfolios towards alignment with environmental goals. Take SDG 15, which calls for preservation of the forms of life on our planet. Investable themes linked to these goals and highlighted by UBS's Chief Investment Officer (CIO) include "Renewable energy," "Clean air and carbon reduction," and "Waste management and recycling," among others. To give another example, in 2019 our Investment Bank supported 25 high-profile issuances of green and sustainable bonds. These green and sustainable bonds support projects in the areas of energy efficiency, pollution prevention and control, terrestrial and aquatic biodiversity conservation, climate change adoption among others.

Through our philanthropy services, we offer innovative ways to tackle some of the world's most pressing environmental problems through advice, insights and execution. We also published several guides like "Seeds of change" and "Sea beyond the Blue" to help philanthropists make more informed decisions about their philanthropy, pointing out the importance to protect biodiversity and how to drive systematic change.

¹⁰⁶ See ubs.com/gri. UBS applies an ESR framework to help us to identify and manage potential adverse impacts to the environment and to human rights, as well as the associated risks affecting our clients and our firm. We have set standards in product development, investments, financing and for supply chain management decisions. We have identified certain controversial activities we will not engage in, or will only engage in under stringent criteria. As part of this process, we engage with clients and suppliers to better understand their processes and policies and to explore how any environmental and social risks may be mitigated.

We support social entrepreneurs to scale their positive change by connecting them with our network of employees, partners and clients, via the UBS Global Visionaries program. Through this program we are supporting, for instance, IPE (Institute for Ecological Research) which is dedicated to biodiversity conservation in Brazil and 'Parley for the Oceans' which was formed to 'bridge the gap between environmentalists and corporations' by bringing together scientists, artists and brands to find solutions to prevent the destruction of the oceans.

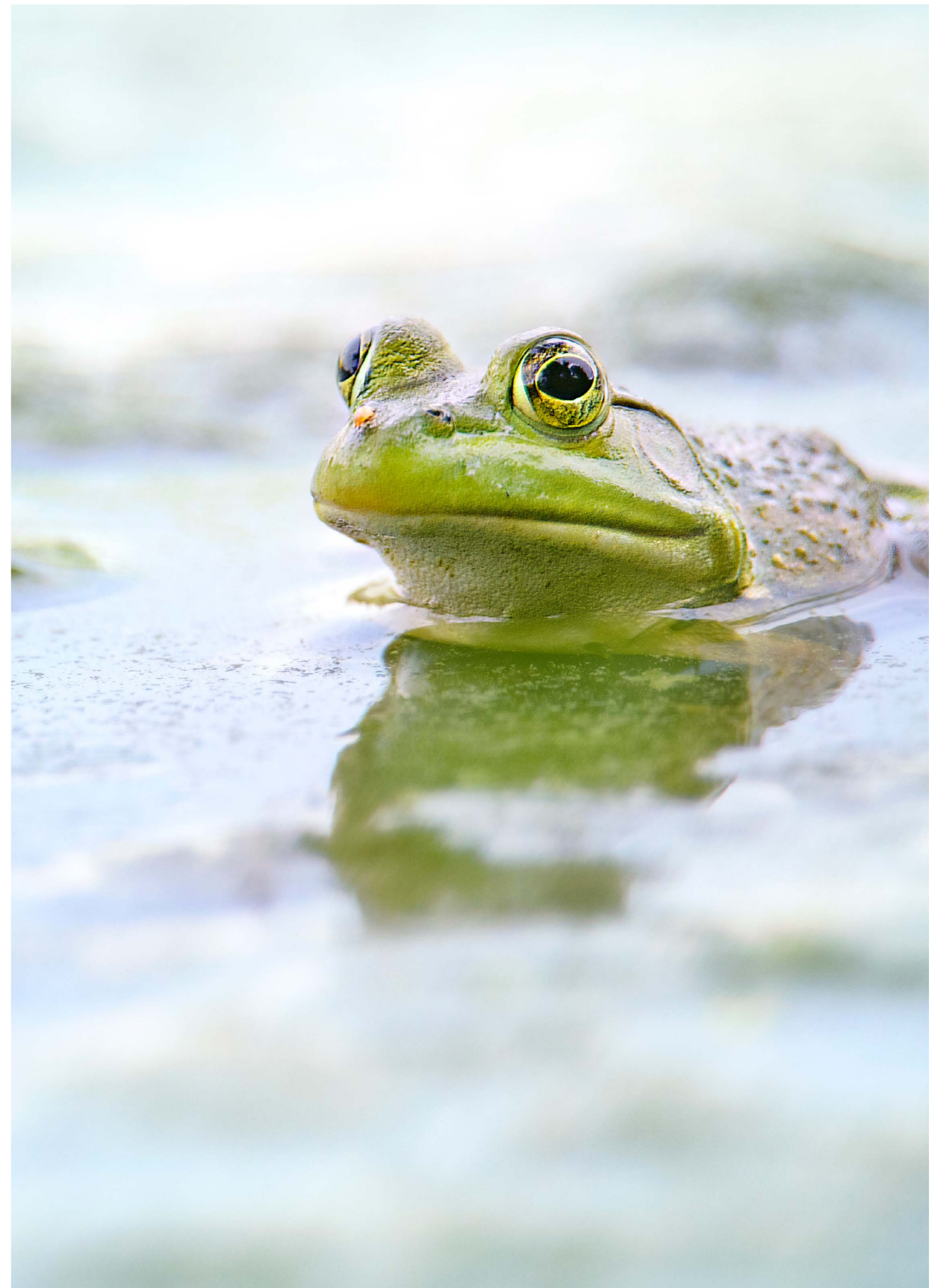
Engaging in initiatives addressing biodiversity risks

UBS is actively involved in relevant developments, demonstrating thought leadership on biodiversity topics. Most notably these include our membership of the Roundtable on Sustainable Palm Oil (RSPO) and our participation in various work streams of the Natural Capital Finance Alliance (NCFA), which aims to provide the knowledge and tools that help the financial sector to align portfolios with global biodiversity goals.

Recognizing the importance of developing tools that facilitates biodiversity-related risk assessment, UBS participates in the advisory committee for the second stage of the NCFA's project tool ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure). And, as biodiversity loss is – as highlighted above – closely linked to climate change, we also view as pertinent our active participation in the development and application of tools and methodologies to measure and disclose climate related impacts (notably UNEP FI, PACTA).

Raising employees' awareness about biodiversity

UBS has launched several campaigns to involve our employees and raise awareness of our environmental impact and of biodiversity loss. A notable example is the campaign 'Go drastic, Cut the plastic' to eliminate single-use plastic items from use throughout the firm. A further noteworthy initiative is the creation of the "Going Greener" app where UBS employees take on fun challenges and get interesting facts and practical tips around sustainability and climate-friendly behaviors for their daily life. Employees also participate in volunteering activities to remove invasive species and protect the forest in the locations where we are active.



Disclaimer

This document has been prepared by UBS Switzerland AG, its subsidiary or affiliate (“UBS”). This document is for personal use only.

This document and the information contained herein are provided solely for informational and/or educational purposes. Nothing in this document constitutes investment research, investment advice, a sales prospectus, or an offer or solicitation to engage in any investment activities. The document is not a recommendation to buy or sell any security, investment instrument, or product, and does not recommend any specific investment program or service.

Although all information and opinions expressed in this document were obtained in good faith from sources believed to be reliable, no representation or warranty, express or implied, is made as to the document’s accuracy, sufficiency, completeness or reliability.

All information and opinions expressed in this document are subject to change without notice and may differ from opinions expressed by other business areas or divisions of UBS. Experts interviewed for and quoted in this publication are third party experts representing their own views and may not necessarily be the same as those of UBS AG and its affiliates. UBS does not attest to the accuracy and completeness of any information or associated materials provided by them. UBS makes no recommendation in relation to them or their services.

No affiliation, association, sponsorship or endorsement is suggested or implied by UBS to any person, entity, company or organization mentioned in this material, although UBS may have or have had a relationship with, or may provide or have provided products and/or services to, certain persons, entities, companies and/or organizations mentioned herein.

References to the United Nations SDG’s by an entity does not imply the endorsement of the United Nations of such entity, its products or services, or of its planned activities.

UBS is under no obligation to update or keep current the information contained herein.

Nothing in this document constitutes legal or tax advice. UBS and its employees do not provide legal or tax advice. This document may not be redistributed or reproduced in whole or in part without the prior written permission of UBS. To the extent permitted by the law, neither UBS, nor any of its directors, officers, employees or agents accepts or assumes any liability, responsibility or duty of care for any consequences, including any loss or damage, of you or anyone else acting, or refraining to act, in reliance on the information contained in this document or for any decision based on it.

Important information in the event this document is distributed to US Persons or into the United States

As a firm providing wealth management services to clients, UBS Financial Services Inc. offers investment advisory services in its capacity as an SEC-registered investment adviser and brokerage services in its capacity as an SEC-registered broker-dealer. Investment advisory services and brokerage services are separate and distinct, differ in material ways and are governed by different laws and separate arrangements. It is important that clients understand the ways in which we conduct business, that they carefully read the agreements and disclosures that we provide to them about the products or services we offer. For more information, please review the PDF document at ubs.com/relationshipssummary.

Important information in the event this document is distributed by the following domestic businesses (which have separate local entities to that of the booking centers)

Austria This publication is not intended to constitute a public offer under Austrian law. It is distributed only for information purposes by UBS Europe SE, Niederlassung Österreich, with place of business at Wächtergasse 1, A-1010 Wien. UBS Europe SE, Niederlassung Österreich is subject to the joint supervision of the European Central Bank (“ECB”), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Austrian Financial Market Authority (Finanzmarktaufsicht), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB.

Brazil This publication is not intended to constitute a public offer under Brazilian law or a research analysis report as per the definition contained under the Comissão de Valores Mobiliários (“CVM”) Instruction 598/2018. It is distributed only for information purposes by UBS Brasil Administradora de Valores Mobiliários Ltda. and/or of UBS Consenso Investimentos Ltda., entities regulated by CVM.

Canada In Canada, this publication is distributed by UBS Investment Management Canada Inc. (UBS Wealth Management Canada).

Denmark This publication is not intended to constitute a public offer under Danish law. It is distributed only for information purposes by UBS Europe SE, Denmark Branch, filial af UBS Europe SE, with place of business at Sankt Annæ Plads 13, 1250 Copenhagen, Denmark, registered with the Danish Commerce and Companies Agency, under No. 38 17 24 33. UBS Europe SE, Denmark Branch, filial af UBS Europe SE is subject to the joint supervision of the European Central Bank (“ECB”), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt

für Finanzdienstleistungsaufsicht), as well as of the Danish Financial Supervisory Authority (Finanstilsynet), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB.

France This publication is not intended to constitute a public offer under French law. It is distributed only for information purposes by UBS (France) S.A. UBS (France) S.A. is a French “société anonyme” with share capital of € 132.975.556, 69, boulevard Haussmann F-75008 Paris, R.C.S. Paris B 421 255 670. UBS (France) S.A. is a provider of investment services duly authorized according to the terms of the “Code monétaire et financier”, regulated by French banking and financial authorities as the “Autorité de contrôle prudentiel et de résolution.”

Germany: This publication is not intended to constitute a public offer under German law. It is distributed only for information purposes by UBS Europe SE, Germany, with place of business at Bockenheimer Landstrasse 2-4, 60306 Frankfurt am Main. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the European Central Bank (“ECB”), and supervised by the ECB, the German Central Bank (Deutsche Bundesbank) and the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), to which this publication has not been submitted for approval.

Hong Kong: This publication is distributed by UBS AG Hong Kong Branch, a licensed bank under the Hong Kong Banking Ordinance and a registered institution under the Securities and Futures Ordinance. UBS AG Hong Kong Branch is incorporated in Switzerland with limited liability.

Israel UBS is a premier global financial firm offering wealth management, asset management and investment banking services from its headquarters in Switzerland and its operations in over 50 countries worldwide to individual, corporate and institutional investors. In Israel, UBS Switzerland AG is registered as Foreign Dealer in cooperation with UBS Wealth Management Israel Ltd., a wholly owned UBS subsidiary. UBS Wealth Management Israel Ltd. is a Portfolio Manager licensee which engages also in Investment Marketing and is regulated by the Israel Securities Authority. This publication is intended for information only and is not intended as an offer to buy or solicitation of an offer. Furthermore, this publication is not intended as an investment advice and/or investment marketing and is not replacing any investment advice and/or investment marketing provided by the relevant licensee which is adjusted to each person needs. The word “advice” and/or any of its derivatives shall be read and construed in conjunction with the definition of the term “investment marketing” as defined under the Israeli Regulation of Investment Advice, Investment Marketing and Portfolio Management Law, 1995.

Italy: This publication is not intended to constitute a public offer under Italian law. It is distributed only for information purposes by UBS Europe SE, Succursale Italia, with place of business at Via del Vecchio Politecnico, 3-20121 Milano. UBS Europe SE, Succursale Italia is subject to the joint supervision of the European Central Bank (“ECB”), the German Central Bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Bank of Italy (Banca d’Italia) and the Italian Financial Markets Supervisory Authority (CONSOB - Commissione Nazionale per le Società e la Borsa), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB.

Jersey UBS AG, Jersey Branch, is regulated and authorized by the Jersey Financial Services Commission for the conduct of banking, funds and investment business. Where services are provided from outside Jersey, they will not be covered by the Jersey regulatory regime. UBS AG, Jersey Branch is a branch of UBS AG a public company limited by shares, incorporated in Switzerland whose registered offices are at Aeschenvorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH 8001 Zurich. UBS AG, Jersey Branch’s principal place business is 1, IFC Jersey, St Helier, Jersey, JE2 3BX.

Luxembourg: This publication is not intended to constitute a public offer under Luxembourg law. It is distributed only for information purposes by UBS Europe SE, Luxembourg Branch, with place of business at 33A, Avenue J. F. Kennedy, L-1855 Luxembourg. UBS Europe SE, Luxembourg Branch is subject to the joint supervision of the European Central Bank (“ECB”), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Luxembourg supervisory authority (Commission de Surveillance du Secteur Financier), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB.

Mexico UBS Asesores México, S.A. de C.V (“UBS Asesores”) UBS Asesores is a non-independent investment advisor due to the direct relation it has with UBS AG a foreign financial institution. UBS Asesores was incorporated under the Securities Market Law. UBS Asesores is a regulated entity and it is subject to the supervision of the Mexican Banking and Securities Commission (Comisión Nacional Bancaria y de Valores, “CNBV”) registered under number 30060 before the CNBV, which exclusively regulates UBS Asesores regarding the rendering portfolio management services when investment decisions are taken on behalf of the client, as well as on securities investment advisory services, analysis and issuance of individual investment recommendations, so that the CNBV has not surveillance over any other service provided by UBS Asesores. Such registry will not assure the accuracy or veracity of the information provided to its clients. UBS Asesores is not part of any Mexican financial group, is not a bank and does not receive deposits or hold securities. UBS Asesores does not offer guaranteed returns. UBS Ase-

sores has revealed any conflict of interest that could have before. UBS Asesores does advertise any banking services and can only charge the commissions expressly agreed with their clients for the investment services actually rendered. UBS Asesores will not be able to receive commissions from issuers or local or foreign financial intermediaries that provide services to their clients.

Monaco: This document is not intended to constitute a public offering or a comparable solicitation under the Principality of Monaco laws, but might be made available for information purposes to clients of UBS (Monaco) SA, a regulated bank under the supervision of the “Autorité de Contrôle Prudentiel et de Résolution” (ACPR) for banking activities and under the supervision of “Commission de Contrôle des Activités Financières for financial activities”.

If the publication is provided by the Representative Office, include the following disclaimer:

Panama UBS AG Oficina de Representación es regulada y supervisada por la Superintendencia de Bancos de Panamá. Licencia para operar como Oficina de Representación Resolución S.B.P. No 017-2007.

UBS Switzerland AG Oficina de Representación Resolución S.B.P. No. 0178-2015.

If the publication is provided by the Advisory Office, include the following disclaimer:

Panama UBS Asesores SA, Entidad Regulada y Supervisada por la Superintendencia del Mercado de Valores. Licencia para operar como Asesor de Inversiones. Resolución No. CNV-316-01.

Russia UBS Switzerland AG is not licensed to provide regulated banking and/or financial services in Russia. Information contained in this document refers to products and services exclusively available through and provided by UBS Switzerland AG in Switzerland or another UBS entity domiciled outside Russia. UBS employees travelling to Russia are neither authorized to conclude contracts nor to negotiate terms thereof while in Russia. Contracts only become binding on UBS once confirmed in Switzerland or in the location where the UBS entity is domiciled. The Wealth Management Advisory Office within OOO UBS Bank does not provide services for which banking license is required in Russia. Certain financial instruments can be offered in Russia only to the qualified investors. Any attachments and documents with reference to the specific financial instruments do not constitute a personal investment recommendation under Russian law.

Singapore: This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately. Clients of UBS AG Singapore branch are asked to please contact UBS AG Singapore branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or report.

Spain This publication is not intended to constitute a public offer under Spanish law. It is distributed only for information purposes by UBS Europe SE, Sucursal en España, with place of business at Calle María de Molina 4, C.P. 28006, Madrid. UBS Europe SE, Sucursal en España is subject to the joint supervision of the European Central Bank (“ECB”), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Spanish supervisory authority (Banco de España), to which this publication has not been submitted for approval. Additionally it is authorized to provide investment services on securities and financial instruments, regarding which it is supervised by the Comisión Nacional del Mercado de Valores as well. UBS Europe SE, Sucursal en España is a branch of UBS Europe SE, a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB.

Sweden This publication is not intended to constitute a public offer under Swedish law. It is distributed only for information purposes by UBS Europe SE, Sweden Bankfilial, with place of business at Regeringsgatan 38, 11153 Stockholm, Sweden, registered with the Swedish Companies Registration Office under Reg. No 516406-1011. UBS Europe SE, Sweden Bankfilial is subject to the joint supervision of the European Central Bank (“ECB”), the German Central bank (Deutsche Bundesbank), the German Federal Financial Services Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht), as well as of the Swedish supervisory authority (Finansinspektionen), to which this publication has not been submitted for approval. UBS Europe SE is a credit institution constituted under German law in the form of a Societas Europaea, duly authorized by the ECB.

Taiwan This material is provided by UBS AG, Taipei Branch in accordance with laws of Taiwan, in agreement with or at the request of clients/prospects.

UK: This document is issued by UBS Wealth Management, a division of UBS AG which is authorised and regulated by the Financial Market Supervisory Authority in Switzerland. In the United Kingdom, UBS AG is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of regulation by the Prudential Regulation Authority are available from us on request. A member of the London Stock Exchange. This publication is distributed to retail clients of UBS Wealth Management.

UAE/DIFC UBS is not licensed in the UAE by the Central Bank of UAE or by the Securities & Commodities Authority. The UBS AG Dubai Branch is licensed in the DIFC by the Dubai Financial Services Authority as an authorised firm.

Important information in the event this document is distributed cross-border

Bahrain: UBS is a Swiss bank not licensed, supervised or regulated in Bahrain by the Central Bank of Bahrain and does not undertake banking or investment business activities in Bahrain. Therefore, clients have no protection under local banking and investment services laws and regulations.

China: This publication is prepared by UBS Switzerland AG or its offshore subsidiary or affiliate (collectively as “UBS Offshore”). UBS Offshore is an entity incorporated out of China and is not licensed, supervised or regulated in China to carry out banking or securities business. The recipient should not contact the analysts or UBS Offshore which produced this publication for advice as they are not licensed to provide securities investment advice in China. UBS Investment Bank (including Research) has its own wholly independent research and views which at times may vary from the views of UBS Global Wealth Management. This publication shall not be regarded as providing specific securities related analysis. The recipient should not use this document or otherwise rely on any of the information contained in this publication in making investment decisions and UBS takes no responsibility in this regard.

Czech Republic: UBS is not a licensed bank in the Czech Republic and thus is not allowed to provide regulated banking or investment services in the Czech Republic. Please notify UBS if you do not wish to receive any further correspondence.

Greece: UBS Switzerland AG is established in Switzerland and operates under Swiss law. UBS Switzerland AG and its affiliates (UBS) are not licensed as a bank or financial institution under Greek legislation and do not provide banking and financial services in Greece. Consequently, UBS provides such services from branches outside of Greece, only. No information in this document is provided for the purpose of offering, marketing and sale by any means of any capital market instruments and services in Greece. Therefore, this document may not be considered as a public offering made or to be made to residents of Greece.”

Indonesia, Malaysia, Philippines, Thailand: This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately. Any and all advice provided and/or trades executed by UBS pursuant to the material will only have been provided upon your specific request or executed upon your specific instructions, as the case may be, and may be deemed as such by UBS and you. The material may not have been reviewed, approved, disapproved or endorsed by any financial or regulatory authority in your jurisdiction. The relevant investments will be subject to restrictions and obligations on transfer as set forth in the material, and by receiving the material you undertake to comply fully with such restrictions and obligations. You should carefully study and ensure that you understand and exercise due care and discretion in considering your investment objective, risk appetite and personal circumstances against the risk of the investment. You are advised to seek independent professional advice in case of doubt.

Nigeria: UBS Switzerland AG and its affiliates (UBS) are not licensed, supervised or regulated in Nigeria by the Central Bank of Nigeria or the Nigerian Securities and Exchange Commission and do not undertake banking or investment business activities in Nigeria.

Poland: “UBS is a premier global financial services firm offering wealth management services to individual, corporate and institutional investors. UBS is established in Switzerland and operates under Swiss law and in over 50 countries and from all major financial centers. UBS [insert Legal Entity] is not licensed as a bank or as an investment firm under Polish legislation and is not allowed to provide banking and financial services in Poland”.

Portugal: UBS Switzerland AG is not licensed to conduct banking and financial activities in Portugal nor is UBS Switzerland AG supervised by the Portuguese regulators (Bank of Portugal “Banco de Portugal” and Portuguese Securities Exchange Commission “Comissão do Mercado de Valores Mobiliários”).

Singapore: This material was provided to you as a result of a request received by UBS from you and/or persons entitled to make the request on your behalf. Should you have received the material erroneously, UBS asks that you kindly destroy/delete it and inform UBS immediately.

UAE: UBS is not licensed in the UAE by the Central Bank of UAE or by the Securities & Commodities Authority. The UBS AG Dubai Branch is licensed in the DIFC by the Dubai Financial Services Authority as an authorised firm.

Ukraine: UBS is a premier global financial services firm offering wealth management services to individual, corporate and institutional investors. UBS is established in Switzerland and operates under Swiss law and in over 50 countries and from all major financial centers. UBS is not registered and licensed as a bank/financial institution under Ukrainian legislation and does not provide banking and other financial services in Ukraine.

UBS Group AG
P.O. Box
CH-8098 Zurich

ubs.com

