ecosphere+

The Case for Forests:
A business and policy imperative

Forests are more than simply a collection of trees or a beautiful landscape. When it comes to cleaning the world's polluted atmosphere they are powerful natural allies.

In addition, forests supply resources like timber, bark, seeds, fruit, oils and even medicines and one fifth of the world's population rely on them for their livelihoods and wellbeing.

Yet often we take for granted the services provided naturally by forests, without considering their economic value and the financial losses which arise when forests are degraded or destroyed.

Ecosphere+'s forest projects

Ecosphere+ is a climate solutions company that helps businesses create and implement nature-based solutions to enable them to succeed in a world aligned with global climate and development goals.

As part of the €100 million impact investment Althelia Climate Fund, Ecosphere+ brings to market a best-in-class portfolio of forest conservation projects, generating verified carbon credits and measurable sustainable development impacts.

By buying Ecosphere+ carbon credits to rebalance their carbon footprint, address deforestation in their supply chains or meet sustainability goals, our customers help to protect these areas, which are all under a direct threat of deforestation.

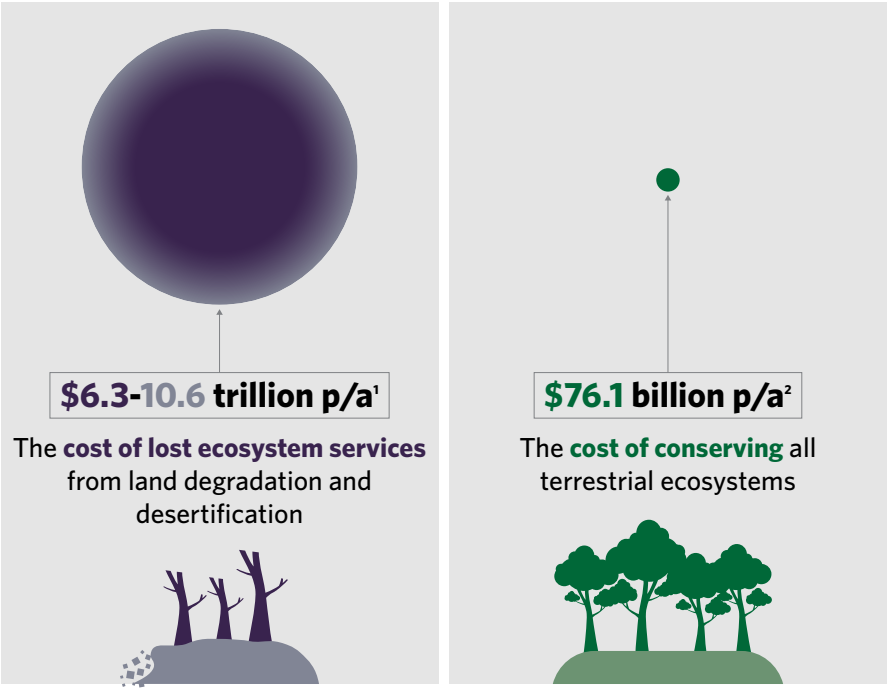
The work done by our NGO and technical partners on the ground helps to address the drivers of deforestation whilst also protecting habitats, offering impoverished communities a more sustainable way of making a living and a number of other outcomes that further the UN's Sustainable Development Goals.

The value of forests

Purchasing carbon credits helps to prevent deforestation by putting a value on the services which living forests provide, in particular by paying for the carbon which forests store.

The system to develop projects which can earn credits and get payment for environmental results is called REDD+ (Reducing Emissions from Deforestation and Degradation). The money raised from these credits finances forest conservation, agroforestry projects and livelihoods for local communities and have a positive social and environmental impact, including producing forest-friendly products, and crucially, protects them for the future.

VALUE OF CONSERVING ECOSYSTEM SERVICES



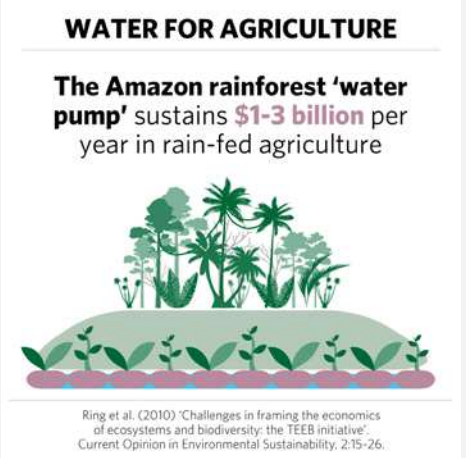
1. McCarthy, D. et al. (2012) 'Financial costs of meeting global biodiversity conservation targets: Current spending and unmet needs'. Science, v.338, pp.946–949 | 2. IUCN (2015) Issues brief: Land degradation and climate change.

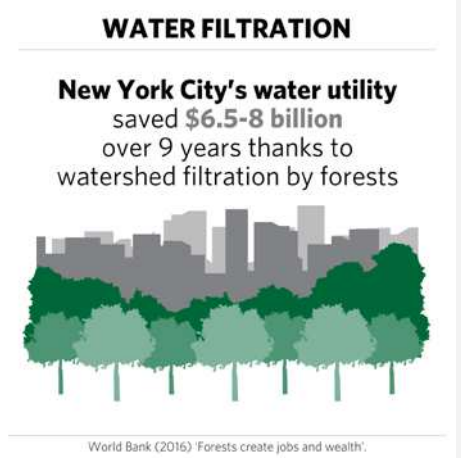
ecosphere+

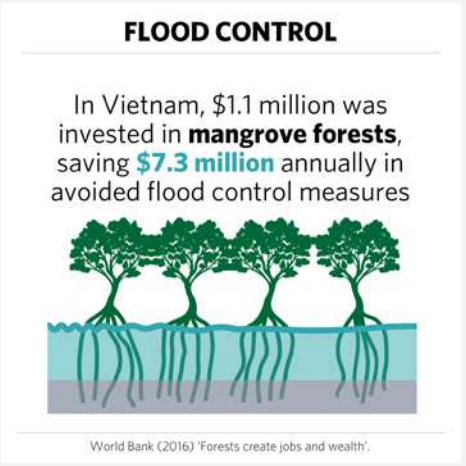
Forests should not be valued purely by their financial worth. They also provide a host of additional co-benefits including:

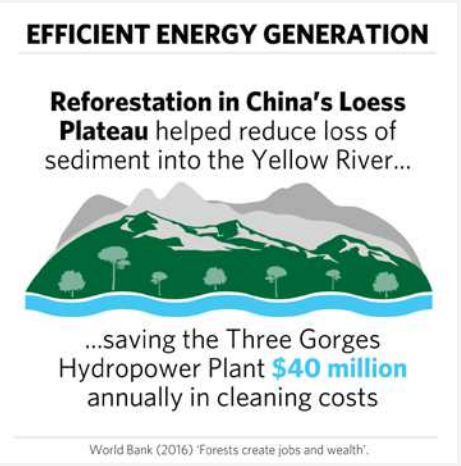
- **Regulating and filtering water**
- **Anchoring soil and preventing erosion in rain or flood-prone areas**
- **Improving agricultural conditions**
- **Uplifting impoverished communities**
- **Protecting biodiversity**
- **Nurturing thousands of species that carry out environmentally critical roles, such as pollination**

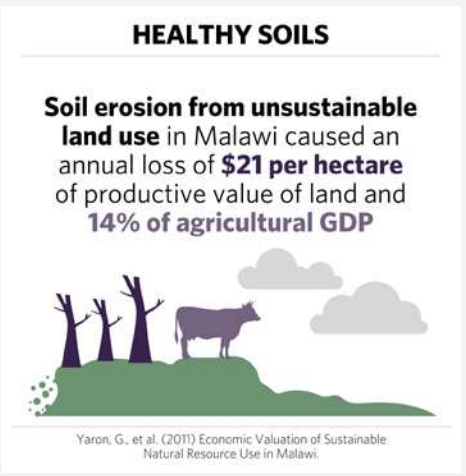
Protecting forest ecosystems really is the soundest investment we can make.











The benefits of forests

The main reason for buying verified carbon credits attached to forest conservation projects is that they deliver on climate action by storing large amounts of carbon, and by doing so reduce the carbon concentration in the atmosphere (see below section on the climate for more detail on this). However, protecting forests and related ecosystems also has a host of co-benefits.

Forests regulate and filter water. They anchor soil and prevent erosion in rain or flood prone areas. They improve agricultural conditions, protect biodiversity and nurture thousands of species that carry out environmentally crucial roles, such as pollination. Additionally, forests supply resources like timber, bark seeds, fruit, oils and even medicines.

FOREST CARBON CREDITS DELIVER MORE THAN JUST CARBON

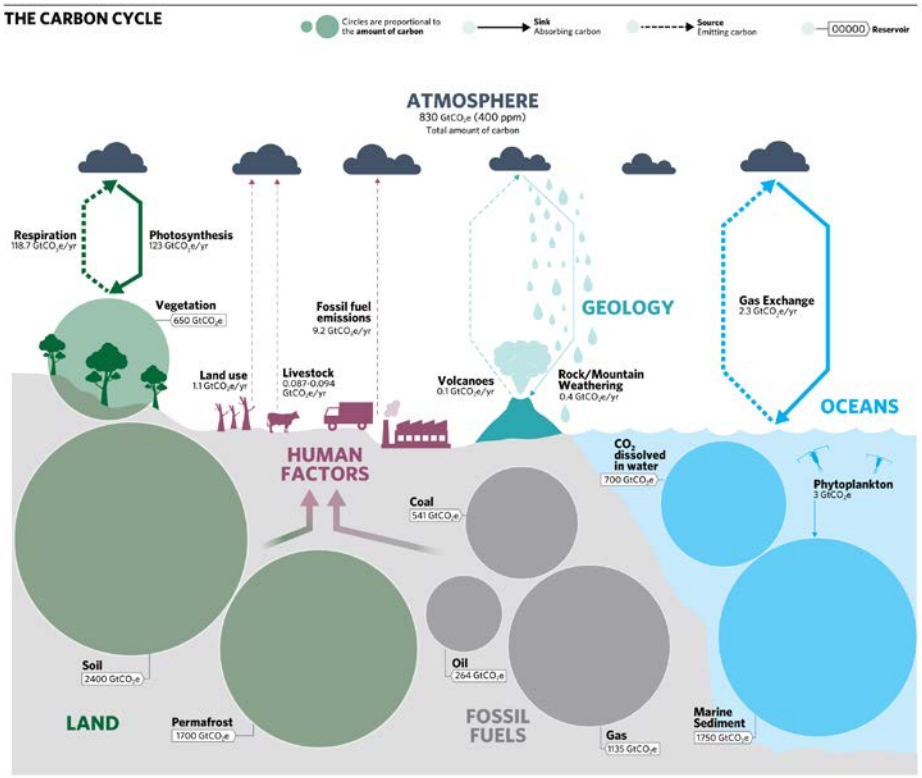
The role of forests in mitigating carbon emissions

Forests absorb and store large amounts of global carbon emissions, both above ground in their roots, branches and leaves, and below ground in the soil.

They absorb more carbon than there is in all current fossil fuel reserves. In fact, 60% of CO_2 emissions since the pre-industrial era used to be stored on land or in the ocean[1]. Life on earth would quite literally not be the same without our forests.

By storing this carbon through absorbing carbon emissions, forests reduce the carbon concentration in the atmosphere, which is why they play a critical role in helping to slow down and even reverse the effects of climate change. If they are cut down or burned, this carbon enters the atmosphere.

All living things are made of carbon, and the carbon cycle is a naturally balanced way of keeping that carbon cycling through the atmosphere, land, water and living organisms. It involves the incorporation of carbon dioxide into living tissue by photosynthesis and its return to the atmosphere through respiration, the decay of dead organisms, and the burning of fossil fuels. Climate change is happening because this natural system is unbalanced and out of control. Preserving and restoring forests is a key way to rebalance the carbon cycle and combat climate stress.

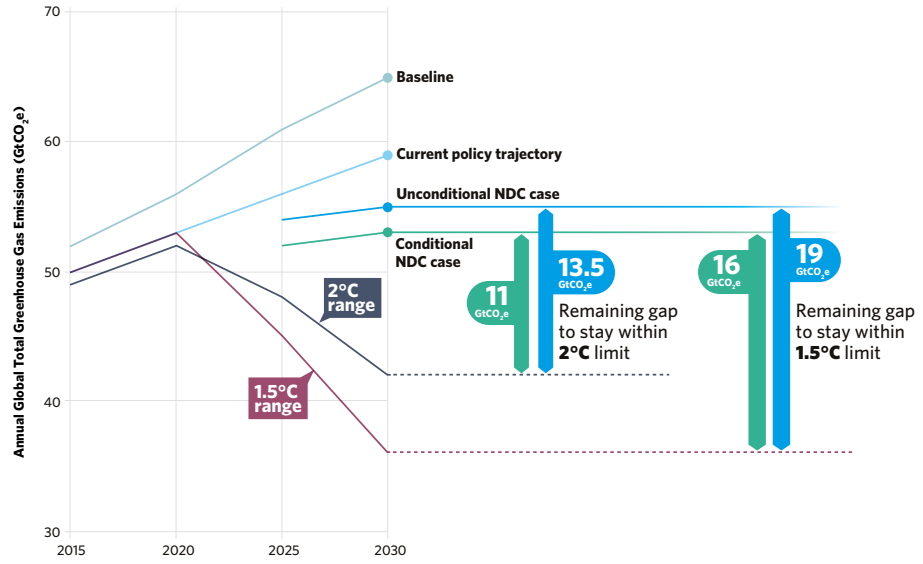


Source: Audubon Magazine (2014) How We Ran Out of Air Time.

Scientists and governments agree that we can accommodate an average temperature rise of no more than 2°C, with most advocating a maximum of 1.5°C, before the negative impacts of increased CO_2 emissions in our atmosphere become too extreme (and too costly) for us to deal with. Even if we change our behaviour to reduce carbon emissions, for example by switching to renewable energy and improving our energy efficiency, the world will still fall 30-50% short of this target and it is not possible to meet it without action on forestry and other natural climate solutions[2].

The diagram below shows the gap we still need to address to stay within a safe climate; even if all the promises of the Paris Agreement are fulfilled, we still need a lot of additional action.

GLOBAL GREENHOUSE GAS EMISSIONS UNDER DIFFERENT SCENARIOS AND THE EMISSIONS GAP IN 2030



Note: Nationally Determined Contributions (NDC) are the commitments made by each country as part of the Paris Agreement to reduce greenhouse gas emissions.
Source: UNEP (2016) The Emissions Gap Report 2016.

ecosphere+

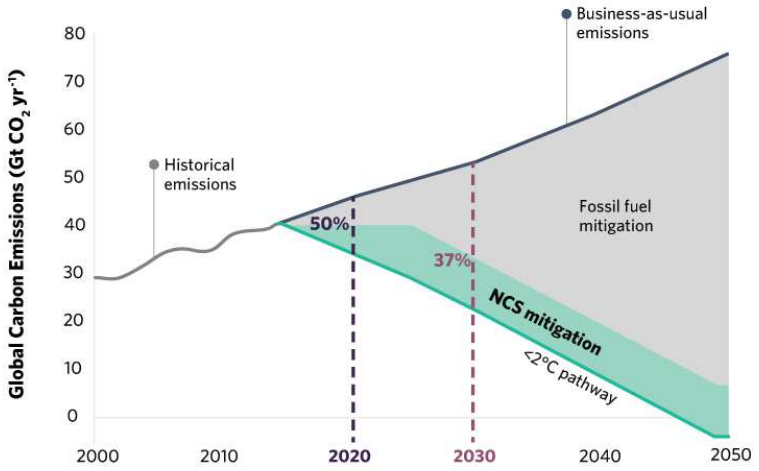
The role of forests

Forest conservation and sustainable land use can provide up to 50% of the pre-2020 mitigation[3]. The forestry and landuse sector is the only sector that can go from being a net emitter today to a net carbon absorber in the future.

Natural climate solutions can provide 37% of cost effective CO_2 mitigation needed until 2030 and gives a more than 66% chance of holding global warming to below 2°C[4]. This includes protecting or restoring our forests, grasslands, wetlands, mangroves and agricultural land. The lowest-cost option is to prevent the conversion or destruction of our forests. One third of this natural mitigation can be delivered at or below $10 per tonne of CO_2, and is the same as taking more than 600 million cars off the road, making this a compelling commercial as well as environmental and social value case.

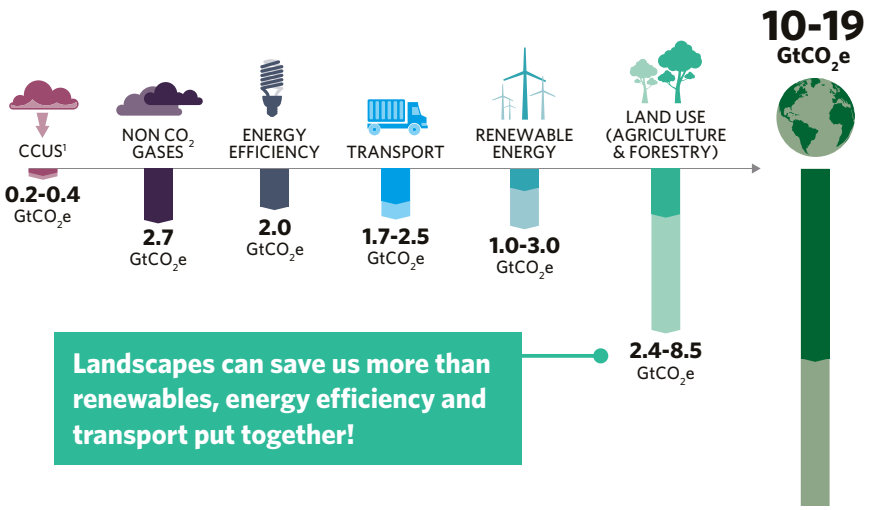
Not only does forest destruction and degradation cause 10% of global carbon emissions, but depending on the size and species, one tree can store between 35 to 800 pounds (or 16 – 363kg) of carbon dioxide each year. That is equivalent to driving a car between 40 and 890 miles[5]. So, preventing their destruction is critical.

NATURAL CLIMATE SOLUTIONS (NCS) ARE ESSENTIAL TO STABILISING WARMING TO BELOW 2°C



Source: http://www.pnas.org/content/114/44/11645.figures-only

MITIGATION POTENTIAL BY 2020



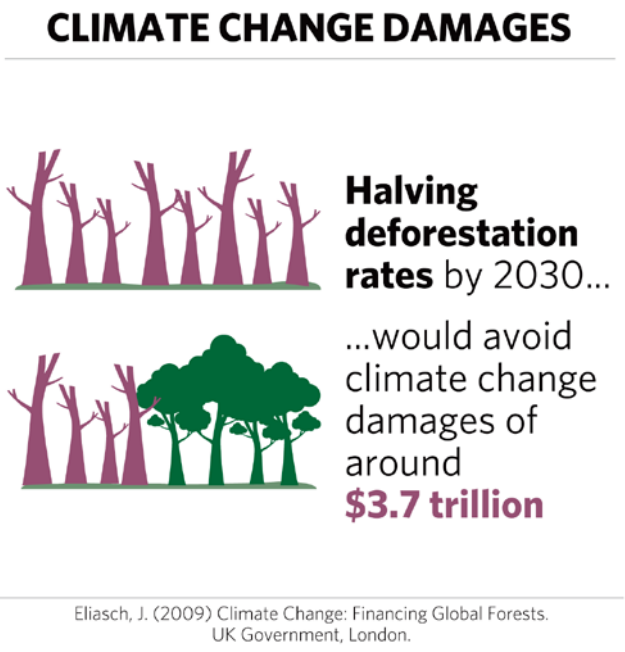
Landscapes can save us more than renewables, energy efficiency and transport put together!

The energy to change

Today, we all have a much greater awareness of our need to use energy more efficiently, effectively and responsibly. On an individual level people are beginning to recycle more, use energy efficient lighting, fit insulation, use smart meters, eat less red meat and shop locally. Cities are bringing in congestion charges, building more cycle lanes, commissioning greener buildings, incentivising electric vehicles and car sharing, and using solar to power street lights. Businesses are improving the carbon footprint of their operations and products, reducing deforestation and emissions in their supply chains, and making better energy choices, with some already pledging to use 100% renewable energy, and are starting to offer more sustainable products. Thousands of businesses report each year on their greenhouse gas emissions levels and are setting targets to reduce them. Governments, banks and investors are also engaged. Renewable energy and a transition away from fossil fuels is becoming more commonplace and cost-effective. However, even with all of this activity, the transition will not happen fast enough to prevent the temperature from rising more than 2°C and that is where forests and land-use come in.

The role of forests in adapting to climate change

Our climate is already changing. We see it in the melting Arctic icecaps, the slowly rising sea levels, an increase in extreme weather events, from hurricanes to droughts, and the changing migratory patterns of birds and marine life.



Eliasch, J. (2009) Climate Change: Financing Global Forests. UK Government, London.

Climate change affects forests too, increasing the risk of forests degrading. For example, pests that kill trees tend to breed more easily through warm winters and wet summers, fires increase in intensity and frequency too. However, forests play an important role in helping to manage this transitioning climate.

The role of forests

Forests are powerful natural, living, breathing ecosystems that can minimise the impact of climate change and help nature adjust to it. They do this by creating more resilient landscapes:

- Make excellent natural flood barriers, creating a physical buffer that protects communities against rising water and landslides
- Regulate water flow in times of drought or flooding; their leaves attract and create moisture, encouraging or even creating rainfall and their roots anchor water in the soil, reducing the risk of desertification
- Lower local surface temperatures, absorbing heat and evaporating water which, in turn, cools the air
- Provide a safety net for local people by providing fuel, food and medicine, which is invaluable if their crops fail
- Improve air quality; vital in our increasingly polluted world
- Keep soil nourished and healthy

Nature

40% of all life on earth exists in our rainforests, and they contain over 65% of the world's entire plant species[6]. Bananas, coffee, cocoa, brazil nut trees, rubber trees and orchids grow in forests, as do trees and plants which provide us with very effective medicines.

Biodiversity

These biodiverse areas are home to around 10 million species of plant, insects and animals, including spectacular primates, flashing blue butterflies, giant anacondas, pygmy elephants, giant hogs, tigers and flying dragon lizards[7].

They provide a livelihood to the indigenous people living in them. Yet these complex, vital, unique ecosystems are under constant threat from over-development. If they disappear then all the life within them vanishes.

Case study: Discovering new species

2017 saw the naming of two new species discovered in an Ecosphere+ project in Peru, a tiny bird called the Painted Manakin (Machaeropterus eckelberryi), and the Lily Rodriguez's Beaked Toad (Rhinella lilyrodriguezae). Both species exist in and are now protected by the Cordillera Azul National Park.

The forests and the variety of species that live there are inter-dependent. They have co-existed for thousands of years, evolving to become self-sufficient ecosystems. When forests are degraded, cut or burned down, the habitats of animals are destroyed. When their homes become fragmented or vanish altogether, their natural migration routes are disrupted, which can result in a species becoming endangered. A lack of diversity also risks unbalancing the entire forest ecosystem, and damaging our most important natural climate solution – the forest itself.

Protecting forests underpins sustainable development, giving local communities an economic incentive to keep their trees standing and to manage their landscapes sustainably. That way they – and the wildlife around them – can thrive.

Case study: Protecting endangered species

Climate finance invested by our customers into the Sumatra Merang Peatland Project goes towards protecting millions of species of plants, insects and animals. Forest patrol teams have recently reported sightings of endangered species such as the Sumatran tiger, Asian Tapir and Sun Bear. The project is partnering with the Zoological Society of London to perform a complete biodiversity assessment to catalogue flora and fauna.

Medicine and health

Forests have a huge, but largely untapped, potential for providing answers to diseases that have alluded modern medicine. Less than 10% of tropical forest plant species have been screened for their medical properties, yet they supply 25% of drugs used in Western medicine[8].

However, the flow of finance to help communities preserve their forests in return for successful prospecting for new drugs has not emerged. Most profits from the few successes – such as the Madagascan rosy periwinkle, a drug used to fight leukaemia and Hodgkin's disease – have flowed to big companies, with few royalties benefiting the communities or countries where the drugs were found.

Some forest-owning governments have therefore moved to block such exploitation, making the discovery of new drugs even more difficult. It is clear that a solution is needed to ensure fair compensation for natural resources.

This is crucial, because rainforests act as natural laboratories, resulting in a remarkable collection of compounds that plants have developed, many of which have surprisingly potent uses in the human world.

They also continue to serve as vital resources for millions of forest-dwelling people who do not have access to formal healthcare, and many of the drugs they use are highly effective. Preserving the forests means that knowledge and culture like this can continue to be used to treat families where no other health service exists.

Case study: Curare plant used in surgery

Curare is found in a number of Central and South American plants. This chemical relaxes muscles and causes paralysis of breath in mammals. Derivatives were perfected as arrow poisons by indigenous people, and today anaesthetists use curare in operating theatres to take over control of a patient's breathing while they undergo surgery.

People

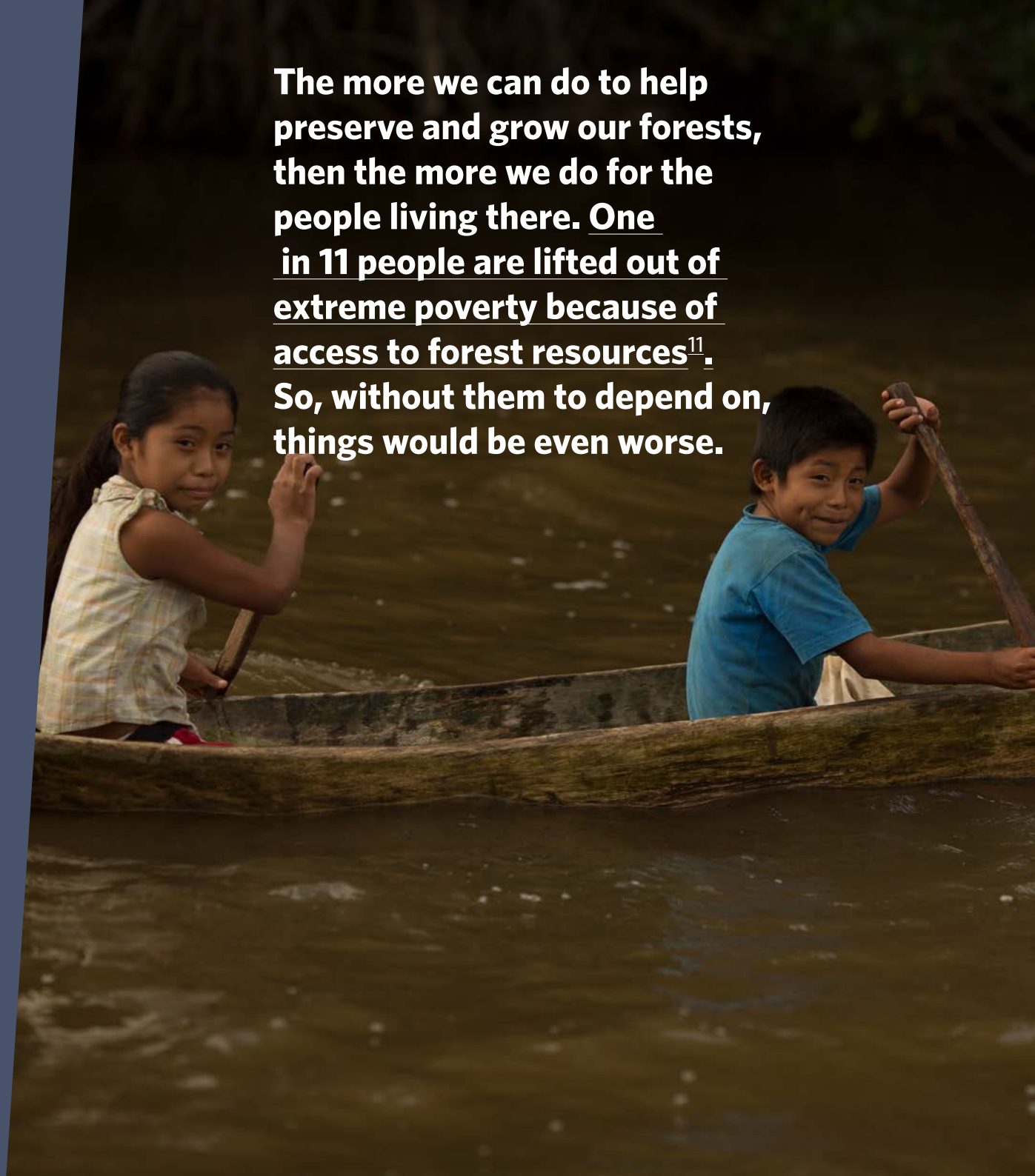
Forests cover 30% of the Earth's land surface with over 1.3 billion people –about one-fifth of the global population – directly depending on them for their livelihoods and well-being [9].

Poverty alleviation

About 10% of the world's population have to survive on less than $1.90 a day – that's 750 million people living on a tiny amount of what those in developed nations take for granted[10].

Solving this problem for so many people is one of the most critical issues of our time. Especially when you consider the world is wealthier, more connected and more advanced than at any time in our history.

Forests hold huge potential for helping to alleviate poverty by providing people with critical resources, a sustainable livelihood from agroforestry, giving them a home either in or nearby a protected forest, and an income from financed forest carbon projects.



The more we can do to help preserve and grow our forests, then the more we do for the people living there. One in 11 people are lifted out of extreme poverty because of access to forest resources[11]. So, without them to depend on, things would be even worse.

Forest resources

Many people living in forests often live outside the cash economy. They derive a 'hidden income' from what the forests give them; food, shelter, building materials, fuel, fodder and medicine.

This informal economy, where activities aren't counted in official statistics, is life-giving to people surviving on a no-cash or cash-limited existence. For example, in Brazil, agriculture, forestry, and fisheries make up only 6% of the country's GDP, but nearly 90% of the total income of the poor[12].

Transformative, sustainable and productive land use

Transforming forest land use to be more productive and sustainable is critical for many of the world's poorest people. It ensures that human activities work with the forest rather than destroy it.

Forest carbon projects target the drivers of deforestation. They show how it's possible to meet the needs of local and indigenous people while still protecting threatened forests. Developing sustainable livelihoods in harmony with the forest can reduce pressures on the environment while helping local people to thrive.

Well-managed protected areas support healthy ecosystems, which in turn help keep the people living in them healthy. This has a transformative effect for the people given access to resources, and the opportunity to use those resources, ultimately improving the long-term well-being of their families and their wider communities.

Case study: Cocoa growing in Peru

Our Tambopata-Bahuaja project in Peru is transforming over 4,000 hectares of degraded land for high quality cocoa cultivation. Our project takes a systematic approach, integrating protection and production activities that empower the local populations and provide real, sustainable incomes for farmers and conservation workers.

Around 195 smallholder cocoa farmers are in the process of forming a cooperative to improve the commercial viability of their product and facilitate access to markets. In addition, increased security and monitoring of the conservation area has created employment for rangers and look-out stations. We are also working hard to clarify land use for local people to secure ownership of their natural resources.

Indigenous people

Indigenous communities living in or close to the world's forests are dependent on these forests for their survival. Their practices, food, medicine and clothing has largely remained unchanged since the time of their ancestors and often they demonstrate a more connected and ecologically aware way of living.

However, the way in which indigenous populations live is under very real threat, and deforestation is partly to blame. By working together with these communities to protect rainforest habitats, we're helping to both preserve their ancient cultural heritage and safeguard our own future. As rainforests are increasingly exploited for commercial and political gain, the way indigenous people are treated has become a focus for the international community. Some forest conservation efforts have even been called into question for not adequately engaging and consulting with these local communities.

We strongly believe that it is the duty of any conservation project to safeguard the way of life of the indigenous populations that live in a forest ecosystem. Their welfare must always be our primary concern.

Case study: Preserving heritage and value in Peru

There are no less than 34 indigenous communities living within our Cordillera Azul project in the Peruvian Amazon,including some groups who live in voluntary seclusion. These communities are the first stewards of the forest; living proof of the project's benefits to nature, people and our climate. We're passionate about preserving the immense cultural, spiritual and creative value they bring to our world. For example, the Yamino community is working right now with a local university to revive their traditional handicrafts.

Sustainable livelihoods

While working with nature, rather than against it, makes long-term sense on paper, it's often simply not practical in real life, particularly for communities who have lost their traditional way of life.

This is because many of the world's poorest communities don't do typical paid work. Instead they consume, and often end up depleting, natural resources just to survive. Small scale, subsistence farming (or 'slash-and-burn agriculture') and using natural resources as fuel are two common examples and large drivers of deforestation.

Delivering aid doesn't benefit in the long-term. It's much more effective and beneficial to focus on building the capacity of people. By working with communities to shift the focus towards more sustainable economic models, we can help to raise them out of poverty.

This can be done by creating access to necessary resources, making the most of institutional and logistical support networks, and being realistic about earning potential.

Poor communities live precariously, with very little cushion between them and negative climate events or social stresses such as storms, droughts and earthquakes. The impact is often devastating and long-lasting. Yet forests can provide a critical safety net, transforming the resilience of rural communities through providing sustenance either directly or indirectly.

Best practices for sustainable living

Any effective model for building sustainable livelihoods takes a considered view of how people and their natural environment interact. The idea is to build new ways of working that are socially and environmentally resilient. In this model, local people work with the forest, rather than against it by creating businesses based on sustainable land use. For example, communities can create agricultural buffer zones around threatened forests and then plant sustainably grown, organic crops like cocoa and coffee. Crops that can then become a sought after fairtrade and sustainable commodity. This approach achieves a social and environmental impact; creating sustainable incomes and at the same time protecting the forest ecosystem from further destruction.

Case study: A sustainable model in Guatemala

On the ground in Guatemala, Ecosphere+'s NGO partner FUNDACEO is carrying out forest conservation and land use restoration while teaching local people how to produce spices and fruit using organic growing techniques.
By consulting with local communities at every stage of the project, they're making sure that it is relevant, beneficial and economically viable, and by putting in place vital training and giving people access to the legal and financial resources they need, the groundwork is laid for future success.

Empowering women

Globally, there is an average gender gap of 32% across economic participation and opportunity, access to education, health and political representation[13].

Women are currently globally under-represented in government, policy making and corporate leadership. All too often they have a weak public voice and less power to determine their futures. Working to redress this imbalance and deliver gender equality is a priority for effective climate action. The transition to a low-carbon world gives us an opportunity to ensure we enshrine these values in the future we are working to create.

Increasing the number of women represented across the political process is a vital step forward, and so is developing 'gender-responsive' climate policy on the ground. Women worldwide control 64% of household spending, so it makes sense to include women in climate policy. Women also reinvest 90% of everything they earn back into their families, while men reinvest just 35%[14]. Transform a woman's prospects and the positive effect is felt by them, their families and their whole community.

Stewards of the forest

Changes to weather that affect crops, access to water and the availability of resources will inevitably be felt first by women. It's most often women who grow food and are responsible for the water and fuel for their families and communities. In indigenous forest dwelling communities, women are proven to be uniquely knowledgeable about the natural resources around them, from food sources and medicinal plants, to wildlife and how species in the ecosystem interact.

Women in these communities are also the primary users of forest resources, standing to lose the most if they're destroyed. They know just how closely fundamental survival is tied up in the forest around them. That makes women perfect stewards, keenly understanding the vested interest they have in preserving the delicate relationship between natural ecosystems.

Case study: Health care clinics in Guatemala

One example of Ecosphere+'s commitment to empowering women can be found in the Guatemalan Caribbean where our Conservation Coast project is helping marginalised and indigenous communities, particularly women, gain access to reproductive health information and care. Specifically, mobile doctor units are reaching people who have never had access to health care before. To date, over 1,000 people have benefited from health services and 710 families are using family planning.

Economy

Forests provide services that allow global societies to eat food, drink water and keep the lights on. They are also at the heart of the trade of many commodities around the world - from timber to coffee.

Forests and food

Around 150 million indigenous people live within or close to dense forest and depend almost entirely on them for food[15]. Forests also safeguard the ecosystem services needed for growing food to feed our growing global population.

For example:

- They pump water around our planet which falls as rain to grow crops all over the world
- Trees fix nutrients into the soil, cycle water and prevent erosion
- Many crops are pollinated by forest insects, like bees

However, unfortunately around 50% of packaged food sold in our supermarkets can be traced to commodities grown on land cleared of rainforests in the last two decades[16] – like beef, soy, palm oil, coffee, and cocoa. Global food security relies on protecting natural landscapes and using them in a more productive, sustainable way. We need a new model that protects rainforests, makes supply chains more transparent, and provides a good livelihood for farmers and families.

The role of agroforestry

Agricultural exports play an important role in poverty alleviation, but agricultural practices need to be managed sustainably if we are to preserve forests' crucial role in food production.

The expansion of the agricultural frontier in the rainforest is a leading cause of deforestation, and our global demand for commodities such as beef, soy, paper and palm oil is where a huge part of the pressure comes from. In some countries, subsistence 'slash and burn agriculture', relied upon by local farmers, is also an important driver.

Fortunately, agroforestry, which is the integration of crops with a variety of trees or shrubs, is on the rise, helping to improve sustainable production. Trees growing alongside farmed fields can help to stabilise these landscapes and increase soil fertility.

Case study: Agroforestry in Guatemala

Our projects work with local people to build capacity in agroforestry systems to produce fairtrade & organic coffee, cocoa and other products. Our Guatemalan Caribbean project is in a biodiversity hotspot. Yet 65% of the original forest cover had been lost to cattle ranching, banana and palm oil plantations, and small-scale subsistence agriculture. FUNDAECO, our local NGO partner on the ground, is working with create or support 450 jobs that develop sustainable, alternative livelihoods to prevent forest destruction.

Sustainable agroforestry systems growing crops such as xate (an ornamental palm), rambutan (a fruit), lychee (a fruit), and cardamom (a spice) are being developed in 1,071 hectares of degraded forest to restore the land.

Forests and energy

Forests are a critical resource for energy production around the world - both as a direct fuel source (through wood and charcoal) and as a key component to the water cycle that hydropower relies on.

Biomass

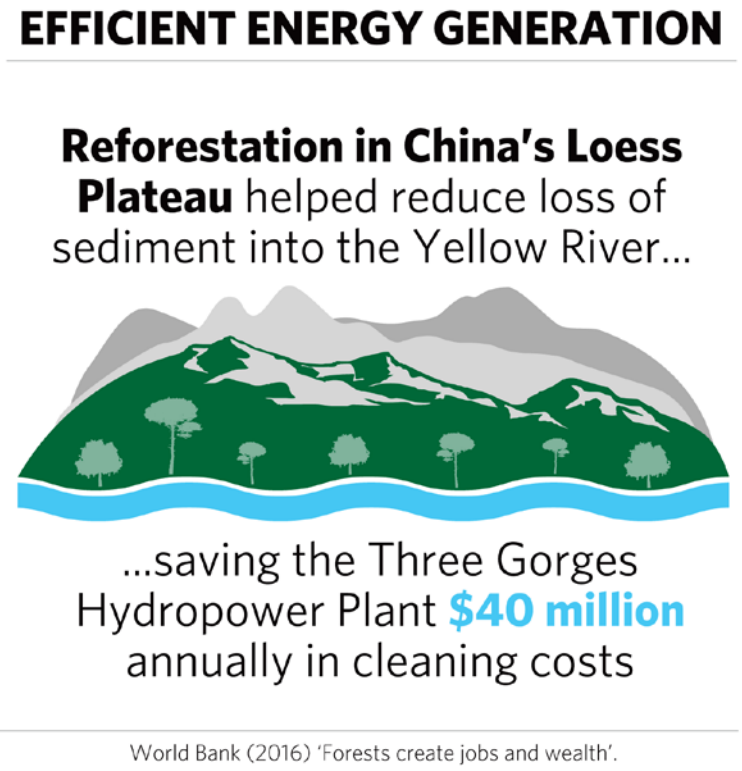
Wood provides energy for more than two billion people around the world. South of the Sahara, it provides over 80% of the energy needed; in Asia, it's similar and in Latin America it's 70%[17].

An increasing population has led to a significant increase in the global demand for wood, leading to greater deforestation; almost 50% of the deforestation in Africa has been caused by demand for wood. Burning wood produces carbon emissions, so the negative impact on the environment is twofold. Finding alternative fuels or more efficient ways of burning wood, will help manage this growing environmental problem as well as reduce the negative impacts on the health of communities as a result of smoke inhalation.

Water power

Hydropower is the world's biggest supplier of renewable energy. In 2016, it provided over 16% of the world's electricity (including 70% of Brazil's electricity), and many countries are looking to it to help them reduce their dependency on fossil fuels. Continued deforestation and the subsequent effects of climate change are altering the environment and making this goal harder to achieve[18]. Reducing forested land cover disrupts the natural water cycle and increases surface temperatures. This alters rainfall patterns, meaning there is a less predictable amount of water in rivers to power dams.

Degraded land can increase the amount of water running into rivers, however this run-off comes at a huge cost, because without the tree roots binding the earth together, the water is filled with soil and mud. This pollutes the rivers and clogs up the dams, reducing their capacity to create energy, and shortening their life, as well as hugely increasing the costs of the plant and of providing clean drinking water.



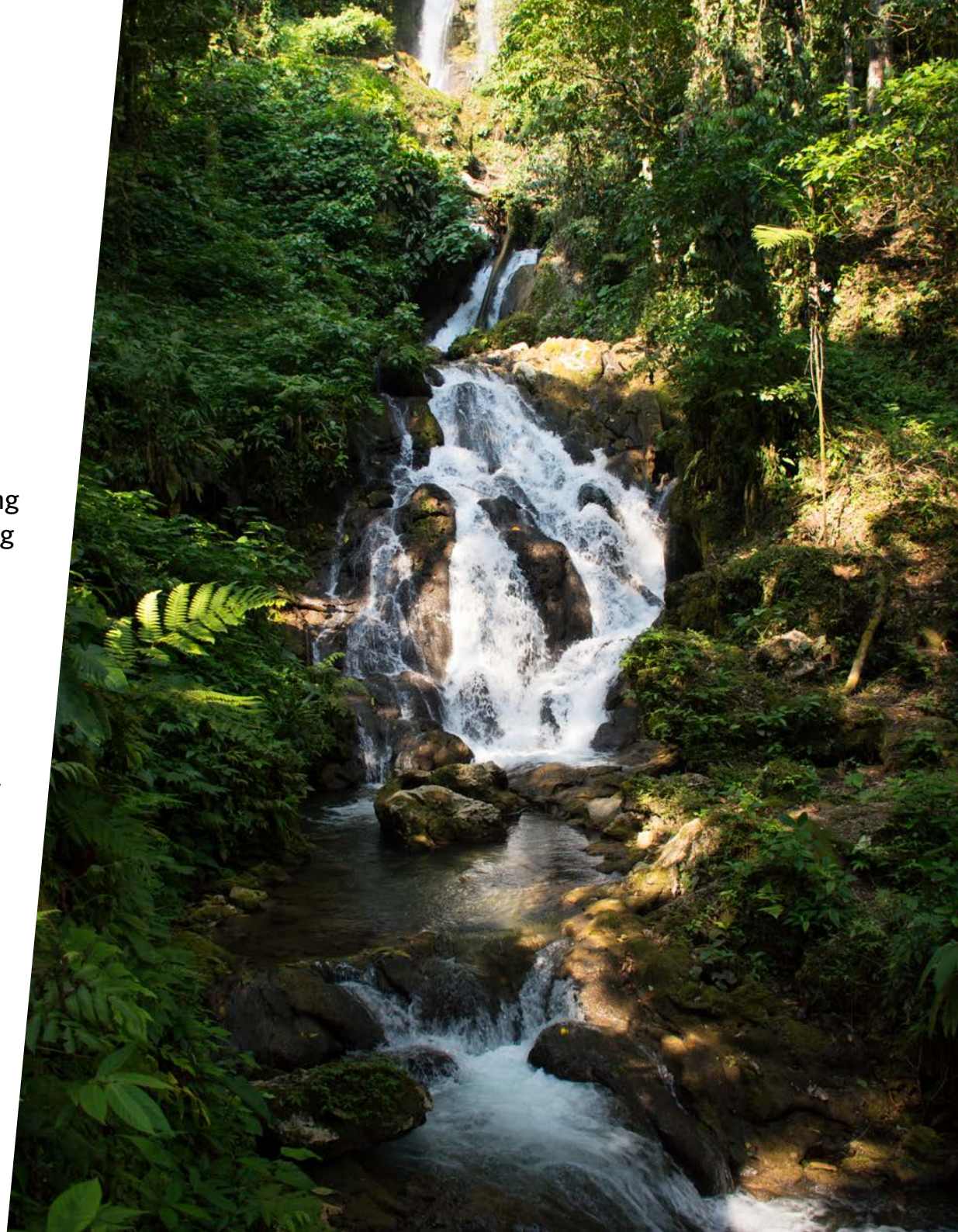
Forests and water

Forests underpin the security of global water supplies.

The Amazon releases eight trillion tonnes of water vapour into the atmosphere each year, falling as snow in the Andes and as rain across the biggest bread basket of the world, in the La Plata Basin of Brazil and Argentina.

Food exports are at risk if water becomes scarce, as a strong harvest relies on predictable water resources. An increasing number of floods and droughts are disrupting crop supply chains and wreaking havoc with food prices. Crops, such as soya, coffee and cocoa, depend on this water and are transported to supermarkets all over the world.

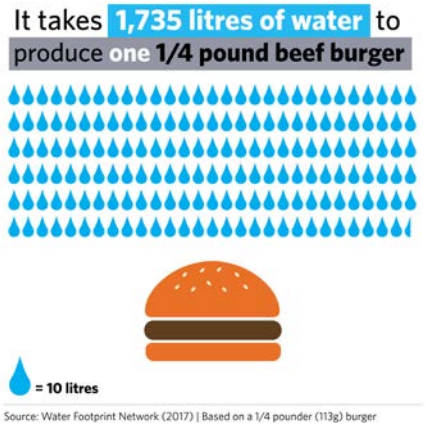
Forests are also the protectors of our water sources, controlling erosion, strengthening streams and river banks, and safeguarding upstream water sources. All of this creates the clean drinking water that we need to live.



Changing weather

In 2014, floods in the western Amazon broke all records, destroying homes and crops. Yet, on the eastern side, 22 million people in the megacity of São Paulo could not get water from their taps, as reservoirs dried to 10% of capacity. This intense water crisis, in one of the wettest countries of the world, was a wake-up call[19].

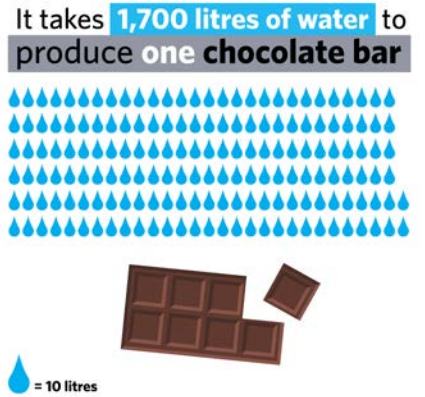
Avoiding deforestation prevents the altered weather patterns that lead to floods and droughts on a scale never witnessed before.



Source: Water Footprint Network (2017) | Based on a 1/4 pounder (113g) burger

Source: Water Footprint Network (2017) | Based on a 330ml bottle

Source: Water Footprint Network (2017) | Based on a 125ml cup



Source: Water Footprint Network (2017) | Based on a 100g bar

About our team

We are a mission driven organization and part of the impact investment fund, Althelia. We are a team of energetic, dedicated experts with diverse backgrounds from oil and gas, government, marketing, climate, finance, communications and academia.

We have extensive and practical experience delivering tailored solutions for global corporations and SMEs from multiple sectors, as well as working with governments, regulators and directly with consumers who are looking to make real change.

Lisa Walker

CEO

Jessica Verhagen

VP Business Development & Strategy

Jen Stebbing

VP Operations & Strategy

Lucy Arndt

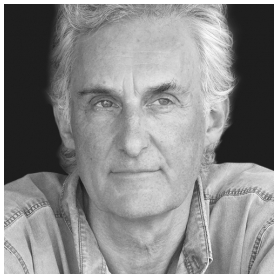
Sales & Business Development Manager

Daniel Fisher

Analyst

Bruno Paino

Senior Consultant



Andrew Mitchell

Advisor

References

1. Royal Dutch Shell (2016) A Better Life with a Healthy Planet: Pathways to net-zero emissions. Retrieved from www.shell.com/energy-and-innovation/the-energy-future/scenarios/a-better-life-with-a-healthy-planet/_jcr_content/par/textimage_494361683.stream/1475857466913/a1aa5660d50ab79942f7e4a629fcb37ab93d021afb308b92c1b77696ce6b2ba6/scenarios-nze-brochure-interactive-afwv9-interactive.pdf

2. Calculated from graph 2. With original data from UNFCCC (2015) Climate Action now: Summary for Policymakers 2015

3. Calculated from graph 2. With original data from UNFCCC (2015) Climate Action now: Summary for Policymakers 2015

4. Griscom, et al. (2017) 'Natural climate solutions'. Proceedings of the National Academy of Sciences of the United States of America.

5. United States Environmental Protection Agency (2017) Greenhouse Gas Equivalencies Calculator. Retrieved from www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

6. Ozanne, et al. (2003) 'Biodiversity Meets the Atmosphere: A Global View of Forest Canopies'. Science. 301:183-6.

7. Ozanne, et al. (2003) 'Biodiversity Meets the Atmosphere: A Global View of Forest Canopies'. Science. 301(5630):183-6.

8. Mongabay (2012) Medicinal Plants. Retrieved from rainforests.mongabay.com/1007.htm

9. The World Bank (2016) Enhance Livelihoods of Forest Communities. Retrieved from www.worldbank.org/en/topic/forests/brief/enhance-livelihoods-of-forest-communities

10. The World Bank (2016) Poverty. Retrieved from www.worldbank.org/en/topic/poverty/overview

11. World Bank (2016) Forests provide vital resources to 1.3B people. Retrieved from www.worldbank.org/en/news/infographic/2016/03/16/forests-provide-vital-resources-to-13b-people

12. Ring et al. (2010) 'Challenges in framing the economics of ecosystems and biodiversity: the TEEB initiative'. Current Opinion in Environmental Sustainability, 2:15-26. Original source: Studies conducted by TEEB.

13. World Economic Forum (2017) The Global Gender Gap Report.

14. Global Clinton Initiative (2009) Empowering Girls & Women. Retrieved from www.un.org/en/ecosoc/phlntrpy/notes/clinton.pdf

15. The World Bank (2016) Enhance Livelihoods of Forest Communities. Retrieved from www.worldbank.org/en/topic/forests/brief/enhance-livelihoods-of-forest-communities

16. Global Canopy Programme (2013) The Little Book of Big Deforestation Drivers: 24 Catalysts to Reduce Tropical Deforestation From 'Forest Risk Commodities'

17. World Agroforestry Centre (2015) Trees for wood energy and land restoration. Retrieved from www.worldagroforestry.org/content/trees-wood-energy-and-land-restoration

18. World Energy Council (2016) Hydropower. Retrieved from www.worldenergy.org/data/resources/resource/hydropower/

19. Earth Observatory (March 7, 2015) Water Levels Still Dropping Near São Paulo. earthobservatory.nasa.gov/IOTD/view.php?id=85406

For more information:

Visit: www.ecosphere.plus
Email: info@ecosphere.plus
Call us: +44 20 7229 9551

@ecosphereplus
@ecosphere.plus
@ecosphere.plus
Ecosphere+

Ecosphere+ Ltd
7 Chalcot Road (Unit 2)
Primrose Hill
London
NW1 8LH
UK