

Royal Botanic Gardens
Kew

Ten Guiding Principles for Investing in Nature

[#InvestingInNature](#)

Foreword

Ed Ikin, Director of Wakehurst

Biodiversity sequesters carbon, cleans our air, reduces flood risk, pollinates our crops and boosts our wellbeing. To protect and enhance biodiversity, we need transformative investment in nature from public and private funding, using scientific evidence to ensure the best long-term returns for nature, people and business. Kew's Nature Unlocked: the Landscape Ecology Programme researches and shares the multiple benefits of biodiversity, generating valuable evidence to shape public policy and corporate strategies. Partnering with Kew can enable companies to achieve meaningful and ethical impact in nature investment.



Guiding Principles for Investing in Nature

Here are ten steps to consider, when it comes to investing in nature to reach net zero.

1 Take a holistic approach – consider the whole ecosystem for nature and people

2 Create multiple positive impacts – avoid negative impacts

3 Plan for the long term

4 Build in climate resilience and adaptation, from day one

5 Conserve and restore, before creating from scratch

6 Design, and manage it with Indigenous Peoples and local communities, in co-ownership

7 Create measurement baselines and invest in technologies for monitoring and reporting on nature

8 Tailor solutions to each unique location

9 Secure funding and long-term monitoring, up-front

10 Support collaborative, science and rights-based partnerships through sustainable finance towards nature positive investments

Adopting a systems perspective

Climate, carbon, biodiversity, people – nature isn't a single entity, but a system of systems. That's why nature interventions must adopt a systems perspective from the start. By taking on this approach from the outset you'll have the biggest impact.

MULTIPLE OVER SINGLE

Does the proposed intervention have multiple demonstrable social, ecological, and financial benefits? Prioritise it over projects whose benefits are solely one or the other.

BOLSTER NATURAL BIODIVERSITY

Landscapes must be able to adapt and weather changes to climate. Build in ecosystem resilience by ensuring natural investments promote biodiversity and restore natural ecosystems.

TAKE A SYSTEMS APPROACH

Nature is interconnected and layered with feedback loops – any change the intervention makes is likely to have consequences somewhere else in the system. Human systems and their social, cultural, and financial trade-offs are also present. Consider the broad array of impacts the investment will have at the start of any project to make better, more informed decisions, and maximise the impact.

NEW DOESN'T MEAN BEST

Restoring an existing ecosystem is usually much more effective than trying to create one from scratch. Existing forests, for example, tend to be more diverse, more able to support local flora and fauna, and better suited to the livelihoods and needs of local communities.

VALUING LOCAL KNOWLEDGE

Indigenous Peoples and local communities possess valuable knowledge about their surrounding environment. Including them from the beginning can help you avoid costly errors, resistance, and poor uptake, all of which will help to ensure the long-term success of the intervention.

ESTABLISH A BASELINE

Gauging the ecosystem at the start of the intervention gives you an all-important metric with which to measure the progress. Without it, you'll struggle to demonstrate the positive impact of the intervention, which could impact the project's long-term viability.

Take a holistic approach – consider the whole ecosystem for nature and people

Nature is a complex system. Change one thing, and it can have huge unintended consequences. **To maximise carbon sequestration and wider co-benefits across landscapes, and lessen potential trade-offs, nature investments must adopt a holistic approach.**

Landscapes, including social, ecological, cultural, and financial systems, are part of a system with feedback loops [3]. By focusing solely on one aspect such as carbon sequestration, this can trigger unintended consequences for both landscapes and people, contributing to climate change rather than mitigating it [3 - 5]. Avoid negative impacts on people through ongoing human rights due diligence before and throughout the project.

As trade-offs are inevitable, the goal is to optimise trade-offs or prevent negative consequences. Investments should prioritise solutions which maximise impacts across nature, people and climate.

They should adopt narrative and delivery plans that show the co-dependence between people and nature [6 – 9, 11]. Nature investments should always recognise indigenous and local community rights, obtaining free, prior, and informed consent before intervening to avoid social disruption that could slow necessary climate action.

A landscape-level approach should also consider the indirect impact of wider land use around the nature investment.

Without understanding the wider context in which the landscape exists, interventions that are positive in theory may have unintended negative outcomes, due to the local particularities. For example, in peatland restoration, nearby agriculture might have affected the water table, which could in turn affect the outcome of peatland interventions [13].

Questions to consider

Have any potential negative consequences for people, biodiversity or carbon been assessed?

Are you taking a truly holistic approach – looking at everything from local ecosystems to neighbouring land use, to the cultural, social and economic needs of local people?

CASE STUDY

A landscape-level approach to sustaining life and agriculture in the Peruvian desert [14]

The Pacific seaboard of the Peru-Chile desert has year-round sunshine, minimal pests, and groundwater, creating ideal growing conditions for native plants. These perfect growing conditions in the “largest greenhouse in the world’ have also led to intensive agricultural farms in the region, that together with the influx of workers, severely threaten the native plants that support local communities, ecosystem services and biodiversity.

In partnership with Sainsbury’s and their supply chain, RBG Kew is working with these large-scale farms which supply global markets, to research, safeguard and restore the native plants to the area. The partnership is developing a model to integrate ecosystems and biodiversity into these intensive agricultural landscapes, in-turn offering mutually beneficial returns such as water use reduction, pollination services, carbon capture, erosion control, worker nutrition, and wellbeing. Commercial plant products using specific native species, have been developed and are being rolled out into schools and communities, ensuring these species ‘conservation through use’.



Acre Rainforest, Brazil © WWF-UK

CASE STUDY

Sky Rainforest Rescue [55]

Sky Rainforest Rescue’s flagship conservation project was in the state of Acre, north-west Brazil. This was a unique partnership between Sky, WWF and the Acre state government. Rainforest covers an incredible 87% of Acre’s territory and over half of the state is designated as protected areas or indigenous lands. Back in 2009 at the beginning of the partnership, the project area (an area the size of Belgium) was particularly at risk from deforestation due to the surfacing of a main road opening up access to the rainforest, which would result in deforestation. Sky Rainforest Rescue’s mission was to keep the rainforest standing by making it possible for local people to make a sustainable living from the forest without having to cut it down.

The impact of the project has been immense. One billion trees are still standing in the project area, avoiding over 3.7 million tonnes of carbon emissions. 1,500 farming families are engaged in sustainable agriculture and forest resource production, including wild rubber markets. Education programmes have taught 3,000 local school children about protecting their rainforest, and back in the UK and Ireland, over 7.3 million people got an increased understanding of deforestation thanks to Amazon themed programming and over 5 million people are engaged in Sky’s online rainforest-themed campaigns. The trees and livelihoods projects are still ongoing.

Create multiple positive impacts – avoid negative impacts

Nature investments should yield carbon, biodiversity, and human benefits – and we must prioritise those with demonstrable positive impacts across all three [9, 15, 16]. They should **resource the protection, restoration and creation of natural ecosystems in regions most vulnerable to and impacted by climate change and regions with biodiversity hotspots.**

However, nature investments should include legal recognition of Indigenous Peoples and local communities rights to stored carbon, land for cultural uses, livelihoods and food.

Through meaningful stakeholder engagement of potentially affected groups including workers, local and Indigenous Peoples, local communities, and future generations, in addition to educational opportunities and health benefits, these investments bring the potential to provide decent work and economic gains. True partnership with these stakeholders maximises the opportunities for the benefits associated to be felt today and for future generations.

Investments should also focus on building evidence and resourcing wider natural habitats with climate mitigation potential, including grasslands, peatlands, and wetlands, alongside forest and woodland ecosystems. For example, despite covering roughly 3% of the Earth's surface, peatlands contain around a fifth of our soil carbon. Although European peatlands sequester 5x more CO₂ than forests, 50% are degraded due to direct drivers of ecosystem change and a chronic lack of investment despite their importance [13]. Similarly, natural grasslands support high levels of biodiversity and soil carbon. Notwithstanding they are culturally significant; the vastness of grasslands covering our planet means they are an important landscape that contributes towards climate change adaptation and mitigation, alongside co-benefits to people [17-20].

Questions to consider

Are you considering the solution which offers the greatest benefits: ecologically, culturally, economically?



Madagascar's food rice paddies, Maria Vorontsova © RBG Kew

CASE STUDY

The importance of the grasses and savannahs of Madagascar, RBG Kew [52]

Grasslands were, until recently, considered a human-caused landscape in Madagascar, formed as a byproduct of deforestation. Work by RBG Kew has demonstrated that these socially important and iconic landscapes of Madagascar are instead generated by fire and grazing, and pre-date the arrival of humans on the island. This misunderstanding has led to limited protection of the ancient Malagasy grassland landscapes, despite their importance for carbon storage, food and water provision, building materials, and animal fodder. Understanding Madagascar's grasslands is also important as some grass species are a major weed in local rice paddies. Working with local partners, RBG Kew is documenting the grasses of Madagascar to understand the multiple impacts these culturally important landscapes provide and using this to shape future land management and conservation planning.

TOOLKIT

The Nature-based Solutions (NbS) Evidence Platform, University of Oxford [21]

The Nature-based Solutions (NbS) Evidence Platform is a free, interactive map linking nature-based solutions to climate adaptation outcomes.

The tool enables you to explore evidence on different nature-based interventions and their effectiveness in addressing climate change impacts, alongside social, economic, and ecological effects. The tool offers multiple scales e.g. filtering by region, country, ecosystem type, intervention type or outcome type, directly linking scientific evidence and place-based context.

3

Questions to consider

Are you planning for the longest possible time-horizon, modelling and monitoring the impact in a precise and detailed way?

Have you checked whether the standard you are using includes long time frames for monitoring?

Plan for the long term

There is no cheap or quick fix for climate change. To meet the Paris Agreement goals and Science-Based Targets initiative (SBTi), we all need to think very long term. Try to plan and invest for the next 50-100 years, at least.

There can be a long lag time when planting for carbon capture. So collectively, we need to act now, to achieve results much later. Investing in the long-term natural ecosystem also yields better returns in carbon-offsetting markets, where permanence is recognised.

Despite that, shorter term interventions, with a time frame of 15-50 years still matter. They still delay the release of carbon, prevent ecosystem tipping points and open up a wider range of options for reducing carbon.

To help you make the right plans, model the changes over time on a case-by-case basis for the specific ecosystem [2, 3]. Use climate models and greenhouse gas (GHG) emissions predictions, as well as consultation with Indigenous Peoples and local communities, who often make decisions on multi-generational timelines.

UK Government approved carbon codes demand monitoring over long periods of time. Take the Woodland Carbon Code (WCC), for example. It models changes in carbon sequestration at five yearly intervals for new woodlands. The modelling draws on site-specific evidence like species mix, natural regeneration, local geographical data and land management plans. Local forestry knowledge is used to adjust modelling estimates to make them as accurate as possible.

Over a time frame of 50-100 years, there will be changing trade-offs between carbon, biodiversity and people. Especially as carbon prices increase and biodiversity markets develop.

An aerial photograph of a lush, dense Atlantic rainforest. The canopy is a mosaic of various shades of green, with some trees showing reddish-brown hues. The forest extends to the horizon, creating a textured, undulating surface. A white rectangular box is overlaid on the left side of the image, containing text.

TOOLKIT

Nature Map Explorer [22]

Most modelling is focused on species changes over time, but there are a growing number of science-based models on ecosystem changes and wider land use. One of these is the Nature Map Explorer. The Nature Map Explorer is a tool that provides a set of global maps on terrestrial biodiversity, carbon storage, and other ecosystem services (benefits of nature to people). The map helps identify areas where conservation and restoration would deliver the highest benefits to biodiversity and climate change aims. The tool was developed jointly by RBG Kew Science, the International Institute for Applied Systems Analysis (IIASA), the Instituto Internacional para Sustentabilidade (IIS), the UN Sustainable Development Solutions Network (SDSN), and the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). The map helps to support the design and planning of policies aimed at limiting biodiversity loss and net greenhouse gas emissions from land use in a broad and holistic manner.

A bird eyes view of the exceedingly diverse Atlantic rainforest, © RBG Kew

Build in climate resilience and adaptation, from day one

The landscape you cultivate will need to adapt to changes in climate. This must be a core part of the planning [1, 4, 15, 23, 24, 12]. You can also design, based on climate predictions.

If you restore existing natural ecosystems and boost biodiversity, you'll make the landscape resilient and more likely to survive and thrive, long into the future.

The more species an ecosystem has, the more resilient it will be. So, avoid monocultures. Understand the role of native and non-native species in establishing ecosystem balance and feedback loops [5, 8, 25]. Restore native vegetation, as well as planting trees. Try to return natural ecosystems to their historic, biodiverse states [5, 17]. Monitor biodiversity over time using the Mean Species Abundance (MSALU) metric [26].

Work with local land managers and communities, to get the best insights into the way the land has been used in the past. Indigenous Peoples are often the best at fostering biodiverse, native ecosystems. Work with them and learn from their wisdom.



Tree seedlings, Alex Antonelli © RBG Kew

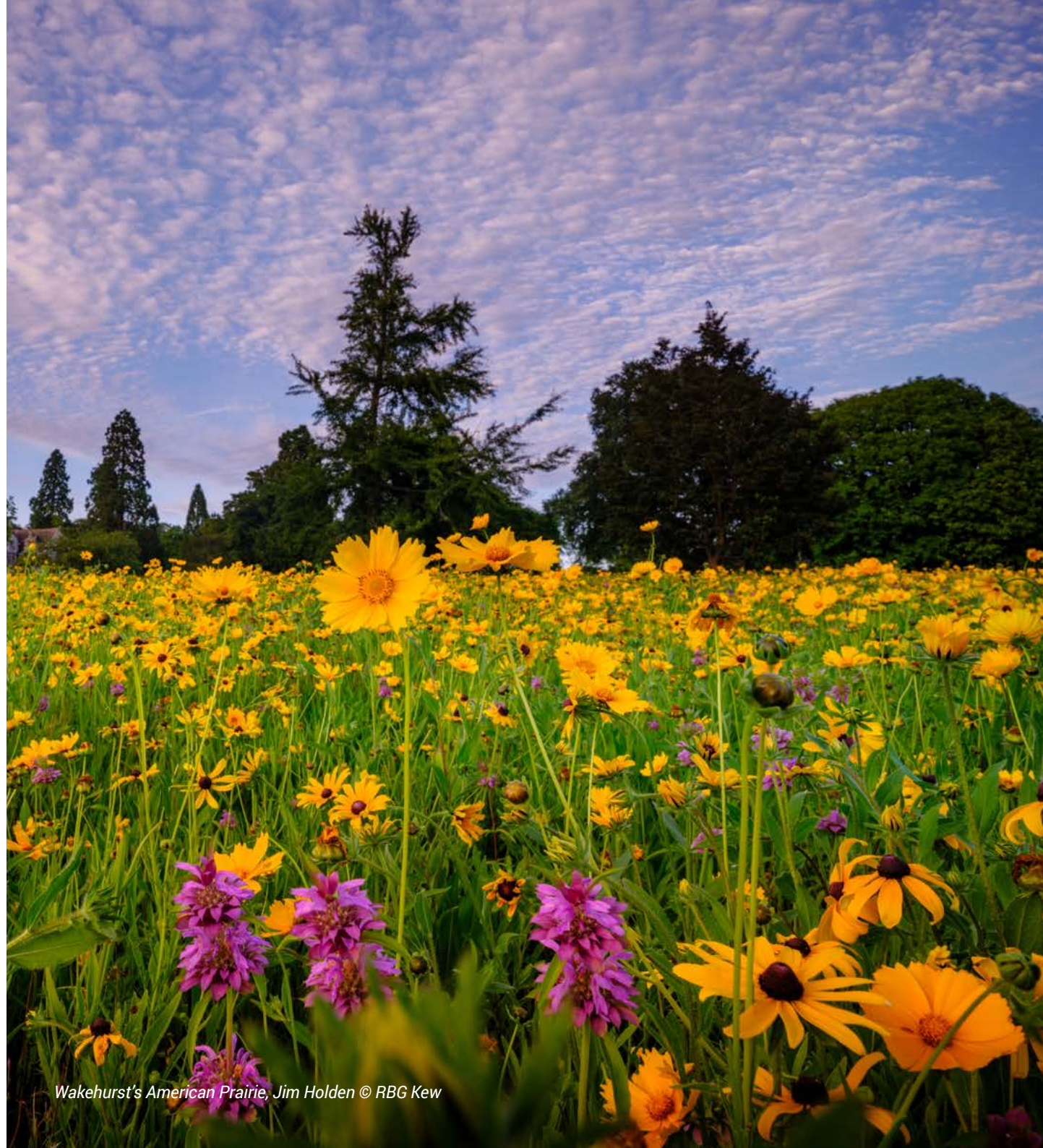
Questions to consider

Are you boosting the biodiversity and resilience of the natural ecosystem, as much as possible?



Biodiversity is a characteristic of ecosystems. It enables ecosystems to flourish and supply the wide variety of services... just as diversity within a portfolio of financial assets reduces risk and uncertainty, so biodiversity increases Nature's resilience to shocks, and thereby reduces risks to the ecosystem services on which we rely... biodiversity provides ecosystems with spare parts; it enables ecosystems to be resilient, to be able to adapt to changing circumstances and to be productive. Reduce biodiversity, and the health of ecosystems generally suffers.

*The Economics of Biodiversity:
The Dasgupta Review, Abridged Version,
p16[27]*



5

Questions to consider

Have you made every effort to conserve or restore existing natural ecosystems?

Conserve and restore, before creating from scratch

Sometimes, when you create a new habitat from scratch, things don't work as you expect. For example, it's possible to plant forest on grasslands, unintentionally degrading existing natural habitats and eventually releasing more carbon than you capture [28]. There's also a high risk of using the wrong plant species in the wrong place.

So, before you create something new, explore whether you can conserve or restore existing natural ecosystems. Conserving what is at risk or restoring what has recently been lost is a much safer bet. It significantly lowers the risk of unintended negative consequences. It also dramatically increases the chance of success. Natural regeneration of forests (instead of planting new forests) can capture up to 40 times more carbon [31].

RBG Kew and Botanic Gardens Conservation International recently teamed up to develop 'Ten golden rules for reforestation' [30]. According to these golden rules, our top priority should be to protect existing forest first. Governments and organisations must work together to legislate against deforestation and to create and enforce more protected areas. We should tackle the local drivers of deforestation, like fires and over-grazing, with local communities. We should also create economic opportunities and incentives, supporting forest-based businesses.

The next priority should be the long-term restoration of historic native forests. It's the best way to ensure biodiversity, helping to safeguard these glorious natural ecosystems. Ensuring they can capture carbon and deliver other benefits, long into the future.

The Ten Golden Rules on Reforestation, RBG Kew and BGCI [30]

1. Protect existing forest first
2. Work together (involving all stakeholders)
3. Aim to maximise biodiversity recovery to meet multiple goals
4. Select appropriate areas for restoration
5. Use natural regeneration wherever possible
6. Select species to maximise biodiversity
7. Use resilient plant material (with appropriate genetic variability and provenance)
8. Plan ahead for infrastructure, capacity and seed supply
9. Learn by doing (using an adaptive management approach)
10. Make it pay (ensuring the economic sustainability of the project)



Ebo Forest in Cameroon, © Xander van der Burgt, RBG Kew

TOOLKIT

World Resources Institute (WRI) interactive atlas of forest landscape restoration opportunities [32]

Restoring forests supports people and biodiversity through the provision of services such as clean water, increased wildlife habitats, carbon storage, soil fertility, and enhancing agricultural and forest products such as biofuel. The WRI's toolkit identifies global areas with opportunity for restoration of forests, whilst also emphasising the importance of actively engaging local communities and partners, restoring whole landscapes not just individual sites, adopting a holistic approach to landscape restoration, and continuing to monitor, learn and adapt.

Design, and manage it with Indigenous Peoples and local communities, in co-ownership

Solutions that look good to policymakers, businesspeople and Western organisations won't deliver, without the help of local communities. In fact, they could even be harmful [33, 34].

It's critical to understand and address any potential negative consequences. You must also uphold the rights and support the livelihoods of Indigenous Peoples, local communities and afro-descendent groups with customary land rights.

Design of nature investments should include meaningful consultation, have the consent and move towards co-ownership and long-term co-management with Indigenous Peoples and local communities.

Explicit consent and cooperation is a minimum standard, in alignment with Free Prior Informed Consent (FPIC) principles. In return, you'll gain vital local knowledge that could make all the difference to the project, and its long-term success and multiple benefits [35, 29]. This could include invaluable insights on local problems like pollution, overcrowding, lack of access

to drinking water and the decline in biodiversity [36]. Local issues like these should be carefully considered in project planning [37]. **Where local communities participate meaningfully in the design and implementation of the solution, it is more likely to succeed [33, 38].** Approaches which seek to empower and deliver long-term benefits to people, include Indigenous co-ownership and advancing land rights. These approaches should be explored and undertaken where possible, as they are likely to have the biggest positives for biodiversity and future generations, enhancing equity and supporting a just transition.

By developing strong partnerships, being deliberately inclusive and engaging in meaningful stakeholder engagement, the benefits of wide support for the project will be felt, leading to long-term benefits for mitigating risk and realising the opportunities.

Questions to consider

Are local communities and Indigenous Peoples empowered?
Is the project benefitting from their wisdom, and ensuring the solution benefits them?



Developing these principles

The considerations for people within the Ten Guiding Principles were kindly discussed by participants, at a side session during Wilton Park's recent Just Transitions Dialogue, facilitated by the Institute for Human Rights and Business, who helpfully challenged RBG Kew and Sky to further embed human rights and community risks and opportunities within these principles.

Further reading

Avoiding parachute conservation [39]

Parachute conservation is the practice of international scientists (typically from high-income countries) conducting research in another country (typically low-income countries) before returning to their home country to complete and disseminate the research without involvement, engagement or communication with others from the nation of interest. This leads to ineffective conservation that is reliant on external expertise or investments and hinders local efforts.

A paper by de Vos and Schwartz (2022) provides ten case studies to evidence a holistic understanding of the problem and solutions. To avoid parachute conservation, they recommend designing and implementing the project in partnership with, or recognition of, local governance, capacity, expertise and social structures. This enables power imbalances to be addressed, which is especially important when the project prioritises external motives or needs rather than in-country and on-location requirements.

Ten people-centered rules for socially sustainable ecosystem restoration [40]

Elias et al's (2022) article in the Journal of the Society for Ecological Restoration responds to the need for social and political reflections on ecosystem restoration alongside carbon sequestration, biodiversity and livelihoods. They highlight that the potential for restoration to enhance livelihoods and achieve the Sustainable Development Goals can only be met through people-centered, holistic and rights-based restoration strategies.

Their ten people-centered rules are:

1. Recognise diversity and interrelations among stakeholders and rightsholders'
2. Actively engage communities as agents of change
3. Address socio-historical contexts
4. Unpack and strengthen resource tenure for marginalised groups
5. Advance equity across its multiple dimensions and scales
6. Generate multiple benefits
7. Promote an equitable distribution of costs, risks, and benefits
8. Draw on different types of evidence and knowledge
9. Question dominant discourses
10. Practice inclusive and holistic monitoring, evaluation, and learning

Create measurement baselines and invest in technologies for monitoring and reporting on nature: you can't manage what you can't measure

Robust data and evidence-based practices from across ecological, social, financial, and cultural disciplines should be embedded in the design of nature investments, avoiding narrow perspectives such as short-term economic gain or carbon sequestration only [8, 10].

These metrics can help better assess potential co-benefits and trade-offs in nature investments across habitats. Any nature investment must incorporate evidence of the ecosystem, including local communities, to assess and account for the co-benefits and trade-offs of implementing a particular intervention.

A baseline is required to measure the ecosystem at the start of the nature investment. This gives an understanding of the dynamics of the landscape you are investing in, so that the correct design and outcomes can be achieved. Looking back in time is also important, understanding historical ecosystem change and what trajectory it is on if no intervention occurs.

The baseline helps assess and monitor the impact of changes in the ecosystem over time, showing the system is moving along a trajectory from a degraded or poorly functioning state to an improved or optimally functioning state. A nature-based intervention may not show positive changes for some time, but they can quickly prevent further ecosystem decline if this is the predicted trajectory of not intervening. Some baselines take a more open-ended approach, but this should be a decision rather than an omission.

To generate a baseline, use existing national and international frameworks – but aim for higher-resolution metrics. Consider aligning with frameworks such as natural capital accounting, the Sustainable Development Goals, carbon and soil codes, alongside any corporate accounting frameworks in line with SBTis and net zero targets.

Questions to consider

Have you established a strong baseline to measure the impact on carbon capture, biodiversity and the social and economic impacts for Indigenous Peoples and local communities?



Wakehurst Nature Unlocked, Jim Holden © RBG Kew

CASE STUDY

Nature Unlocked, the landscape ecology programme at Wakehurst, RBG Kew [54]

Since 2021, RBG Kew has used Wakehurst, its wild botanic garden in Sussex, as a living laboratory, researching the value of UK biodiversity and natural capital using a range of Kew science and horticulture expertise, from remote sensing and soil mycology to citizen science. This research programme is called the Landscape Ecology Programme, centred on the research pillars of carbon, pollination, hydrology and wellbeing. Researchers are developing novel methods and collecting baseline data across these pillars, stacking datasets to understand the co-benefits and value of a biodiverse landscape, from its role in carbon sequestration to providing mental and physical wellbeing benefits to adults and children. These baselines can be monitored over time and will help quantify best practice in landscape management and nature-based solutions, both at Wakehurst and across the UK. In transforming one of the leading visitor destinations in the South East into a hub of scientific research, the project has engaged over 1,300 people as citizen scientists in the first year. RBG Kew is also working with government and academic partners to evidence existing frameworks and policies, such as the UK Woodland Carbon Code and the 25 Year Environment Plan.

To avoid negative trade-offs, the baseline must go beyond carbon. While a carbon-focused approach might incentivise planting young forests, multiple baselines reveal the wider advantages of restoring and conserving existing forests to store carbon, enhance biodiversity and provide social co-benefits to people [5, 18, 41, 42]. Hence, why the baseline should include carbon, biodiversity and benefits to people. These can be linked to relevant,

specific objectives or targets based on what the project is seeking to achieve, in line with co-design with local groups.

Scale is also important. The baseline of a nature investment must be able to be upscaled and downscaled, so the benefits, risks and changes over time can be monitored and communicated from the local to the international level [10].



Soil sampling in a biodiverse coppiced woodland. © RBG Kew



Mangrove plantation drive, a group of women walking through shallow water carrying mangrove saplings. Avijit Ghosh / Climate Visuals



Tree root coated in ectomycorrhizal fungus. © RBG Kew

TOOLKIT

Holistic metrics

For all metrics, the baseline and a past trajectory are necessary to see if the specific intervention has made a difference.

Carbon baselines (metric – kg) should include the stored carbon (carbon stocks) within an ecosystem, rather than only accounting for carbon flow into stocks. There must be a measurement of the flux in and out of these stocks. To achieve this, baselines should include the whole biosphere – above ground biomass, below ground soils and fungi, and greenhouse gas fluxes in and out of the carbon stock. In terrestrial systems, measuring a baseline of fungi is particularly important due to their role as quality indicators [43] for the performance of ecosystems alongside their ability to store carbon [44, 45].

Biodiversity baselines can be generated through measuring species richness and connectivity, the Mean Species Abundance Indicator (MSALU), and exploring historic biodiversity on site to inform future landscape design. Taxonomic data, functional community composition and diversity is also a useful measure, for example carbon-sequestering fungal guilds associated with specific habitats. A recent evaluation of the Darwin Initiative, Darwin Plus and Illegal Wildlife Trade Challenge Fund (IWTCF) funds provides a comprehensive summary of standard measures of biodiversity and suggestions for monitoring and evaluation, which can be applied at the project-level [53].

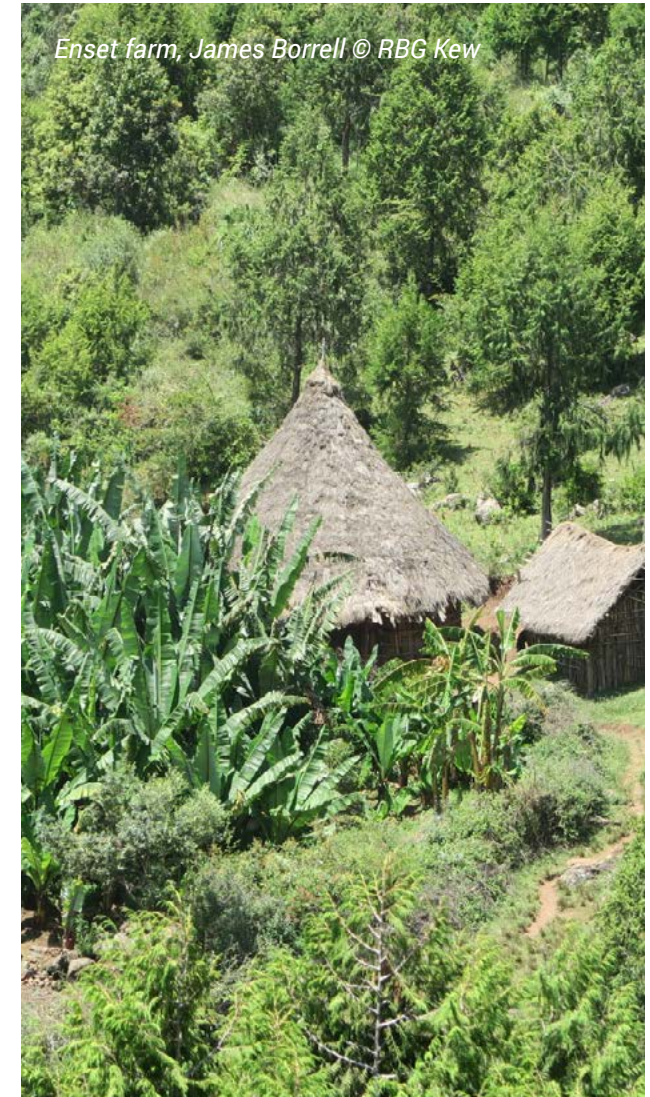
Social baselines should include the benefits of the landscape to people, both pre- and post- nature investment [35]. This should be done through meaningful engagement and consultation with potentially affected groups, as per the global baseline standard on business and human rights to prevent and mitigate impacts on people.

Tailor solutions to each unique location

There is no 'one size fits all' investment in nature. Any nature investment requires site-specific decisions on interventions and management.

Use site-specific baseline data to plan the nature investment, based on the unique conditions in the area. These will include data on the ecosystem, local communities, climate mitigation and local landscape use and should be drawn from a broad range of sources including with value being found in the knowledge of Indigenous Peoples, smallholder farmers, women and young people. Use this information to make decisions that deliver as close to a win:win scenario as possible for carbon capture, biodiversity and local communities [33].

There's a tension between global pathways towards net zero, and place-based, context-specific solutions. To understand and manage this better, we need to do more research on governance structures in nature-based investments involving multiple actors and different scales. The active participation of local communities and Indigenous Groups at the outset can help to minimise tensions.



Questions to consider

Have you used detailed site-specific data and knowledge on the unique natural ecosystem, local communities and landscape use to plan the project?



Deforestation continues in the Atlantic forest, © RBG Kew

CASE STUDY

How RBG Kew's survey tools helped restore Brazil's Atlantic rainforest [47]

The Bahia interior forests ecoregion is a biodiversity and conservation hot spot, located inland from the Atlantic coast in eastern Brazil. To restore some of the degraded habitats in the region and maintain the unique ecosystem, RBG Kew scientists, local universities and communities worked in partnership to develop site-specific conservation plans, including gathering evidence from botanical surveys and local community knowledge. Researchers considered which native plants would flourish in the soil-types of the sites, whether these plants could be sourced in local nurseries, and if they were rare or vulnerable in these areas. This led to the selection of species that occurred naturally in the area, provided resources for local communities, and are locally appreciated. Species were also selected based on soils, their ability to do well in early restoration, where they could be sourced (e.g. local nurseries) and whether they were rare or vulnerable.

Secure funding and long-term monitoring, up-front

Nature investments need continued monitoring of ecosystem change and resilience to ensure they are continuing to provide carbon storage, biodiversity and benefits to people.

Ecosystem resilience can be built from the outset by integrating biodiversity safeguards and designing based on climate predictions. The landscape usually takes years to show significant benefits in carbon and biodiversity, especially carbon stock development in soils, so monitoring over the long term, every 5-10 years, is key [1]. More frequent monitoring may be justified in the early years as above-ground carbon on sites can change rapidly immediately after an intervention due to fast-growing and pioneering species growth, then settle into a slower development. Annual monitoring for the first 3-5 years can check interventions are working and enable management changes to keep targets and objectives on track.

Alongside baseline assessments, set quantitative targets and establish monitoring processes and measures to deal with predicted trade-offs and risks. These risks could come from changes in the way people use neighbouring land, or changes in atmospheric pollution. Or they could be natural risks, from pests, disease, and flooding [48].

Long term monitoring reduces the risk of people's livelihoods being affected due to ecosystem change [49]. The monitoring must include mechanisms for evaluating human rights impacts that may arise.

You must also put in place meaningful operational-level grievance mechanisms for Indigenous Peoples, local communities, and other potentially affected groups to be able to report impacts that can be reliably managed and remedied.

Questions to consider

Have you put in place meaningful systems to monitor the long-term performance of the project, and to capture and remedy any negative impacts?

Support collaborative, science and rights-based partnerships through sustainable finance towards nature positive investments

What we've learnt from years of working with many different partners on nature projects, is that collaboration is key, and the closer you are as an investor to the project itself and key stakeholders on whom success depends, the greater the opportunities for success.

Broad and deep collaborations to develop landscape level strategies can not only support ecosystems and communities to thrive, but can also be a model for even wider scale changes including policy change and truly long-term action.

Inviting scientists and human rights experts into conversations with communities, workers and other affected groups, with a view to meaningful engagement and long-term partnership is critical.

To secure the scale and quality of support for nature needed to restore ecosystems and capture, significant finance is also required. Global leaders' agreement at COP15 provided the opportunity for

transformative action to halt biodiversity decline and the Kunming-Montreal global biodiversity framework (GBF) gives clarity on the alignment of financial flows to the 2030 Goals and 2050 Vision to protect ecosystems around the world. [50]

Considerations for the implementation of the framework include being based on scientific evidence and traditional knowledge and practices, recognising the role of science, technology and innovation, taking a human rights-based approach, and ensuring a focus on intergenerational equity [50].

Questions to consider

Are we supporting successful partnerships and considering long term opportunities through sustainable finance?

Further reading

Just Nature: How finance can support a just transition at the interface of action on climate and biodiversity.

Grantham Research Institute on Climate Change and the Environment [51].

When designing economic restructuring, it will be crucial that those affected by change, including for example Indigenous Groups, vulnerable communities, women and youth, are involved in shaping it.

In its Just Nature report, the Grantham Research Institute has set out a framework of just transition expectations of business for use by financial institutions.

The authors explore how the financial sector can support positive outcomes for the just transition and make these recommendations.

RECOMMENDATION 1

Financial institutions should include just transition principles in their own plans for net zero, nature and biodiversity.

RECOMMENDATION 2

Financial institutions should set just transition expectations of the businesses they lend to and invest in, based on international standards, and ensure that these are included in the net zero and biodiversity plans of nature-exposed companies.

RECOMMENDATION 3

Financial institutions should purposely channel finance to companies committed to and making progress to support a just transition for workers, suppliers, communities and consumers.

RECOMMENDATION 4

Financial institutions should engage with policymakers to reform agricultural, forestry and nature policies so that they support a just transition and provide the incentives, the rules as well as the catalytic public finance that is needed to scale up private investment.

RECOMMENDATION 5

Financial institutions should work to ensure that social and just transition factors are effectively included in key frameworks for reporting and transparency.

What next?

These ten principles reflect best practice in science, nature conservation and corporate sustainability. We hope they can act as a common framework for businesses investing in nature, to deliver net zero targets and beyond. By adopting these principles, corporate partners will make a positive impact – on biodiversity and the communities and livelihoods intertwined with it. We encourage our corporate partners to be curious, challenging sector norms and to seek evidence-based approaches to investing in nature, underpinned by scientifically measured baselines and rigorous monitoring. Rigorous, best practice investments in nature can underpin authentic and compelling public campaigns, creating a point of difference for companies committed to positive change.

Bibliography

1. Griscom, B.W., et al., *Natural climate solutions*. Proceedings of the National Academy of Sciences of the United States of America, 2017. 114(44): p. 11645-11650.
2. *United Nations Framework Convention on Climate Change COP 21 Climate Agreement*. 2015.
3. Keesstra, S., et al., *The superior effect of nature based solutions in land management for enhancing ecosystem services*. Science of the Total Environment, 2018. 610-611: p. 997-1009.
4. Seddon, N., *Nature-based solutions: delivering national-level adaptation and global goals*. IIED Briefing Paper – International Institute for Environment and Development, 2018 (No.17484): p. 4 pp.
5. Temperton, V.M., et al., *Step back from the forest and step up to the Bonn Challenge: how a broad ecological perspective can promote successful landscape restoration*. Restoration Ecology, 2019. 27(4): p. 705-719.
6. Viti, M., et al., *Knowledge gaps and future research needs for assessing the non-market benefits of Nature-Based Solutions and Nature-Based Solution-like strategies*. Science of the Total Environment, 2022. 841.
7. Keith, H., et al., *Evaluating nature-based solutions for climate mitigation and conservation requires comprehensive carbon accounting*. Science of the Total Environment, 2021. 769.
8. Seddon, N., et al., *Getting the message right on nature-based solutions to climate change*. Global Change Biology, 2021. 27(8): p. 1518-1546.
9. Welden, E.A., A. Chausson, and M.S. Melanidis, *Leveraging nature-based solutions for transformation: reconnecting people and nature*. People and Nature, 2021. 3(5): p. 966-977.
10. Nesshöver, C., et al., *The science, policy and practice of nature-based solutions: An interdisciplinary perspective*. Science of the Total Environment, 2017. 579: p. 1215-1227.
11. Baggio-Compagnucci, A., et al., *Barking up the wrong tree? Can forest expansion help meet climate goals?* Environmental Science and Policy, 2022. 136: p. 237-249.
12. Hong, S. and A. Chen., *Contrasting Responses of Soil Inorganic Carbon to Afforestation in Acidic Versus Alkaline Soils*. Global Biogeochemical Cycles, 2022. 36(1).
13. Tanneberger, F., et al., *The Power of Nature-Based Solutions: How Peatlands Can Help Us to Achieve Key EU Sustainability Objectives*. Advanced Sustainable Systems, 2021. 5(1).
14. Royal Botanic Gardens, Kew., (2016). *Sustaining life and agriculture in the Peruvian desert* | Kew. [online] Available at: <https://www.kew.org/read-and-watch/sustaining-life-peruvian-desert> [Accessed 22 Feb. 2023].
15. Calliari, E., A. Staccione, and J. Mysiak, *An assessment framework for climate-proof nature-based solutions*. Science of The Total Environment, 2019. 656: p. 691-700.
16. Chausson, A., et al., *Mapping the effectiveness of nature-based solutions for climate change adaptation*. Global Change Biology, 2020. 26(11): p. 6134-6155.
17. Tölgyesi, C., et al., *Urgent need for updating the slogan of global climate actions from “tree planting” to “restore native vegetation”*. Restoration Ecology, 2021. 30(3).
18. Deák, B., et al., *Eurasian Kurgan database – a citizen science tool for conserving grasslands on historical sites*. Hacquetia, 2019. 18(2): p. 179-187.
19. Veldman, J.W., et al., *Comment on “The global tree restoration potential”*. Science, 2019. 366(6463): p. eaay7976.
20. Shao, C., et al., *Grassland productivity and carbon sequestration in Mongolian grasslands: The underlying mechanisms and nomadic implications*. Environmental Research, 2017. 159: p. 124-134.
21. University of Oxford. (n.d.). *Nature-based Solutions Evidence Tool* I. [online] Available at: <https://www.naturebasedsolutionsevidence.info/> [Accessed 22 Feb. 2023].
22. IIASA, IIS, UN WCMC, Sustainable Development Solutions Network, RBG Kew (2022), *Nature Map Explorer* [online] Available at: <https://explorer.naturemap.earth/> [Accessed 22 Feb. 2023].
23. Cohen-Shacham, E., et al., *Core principles for successfully implementing and upscaling Nature-based Solutions*. Environmental Science and Policy, 2019. 98: p. 20-29.

24. Seddon, N., et al., *Grounding nature-based climate solutions in sound biodiversity science*. Nature Climate Change, 2019. 9(2): p. 84-87.
25. Seddon, N., et al., *Understanding the value and limits of nature-based solutions to climate change and other global challenges*. Philosophical Transactions of the Royal Society B: Biological Sciences, 2020. 375(1794).
26. Nunez, S., J. Verboom, and R. Alkemade, *Assessing land-based mitigation implications for biodiversity*. Environmental Science & Policy, 2020. 106: p. 68-76.
27. Dasgupta, P. *The Economics of Biodiversity: The Dasgupta Review*. Abridged Version. (London: HM Treasury). 2021.
28. Friggens, NL, Hester, AJ, Mitchell, RJ, Parker, TC, Subke, J-A, Wookey, PA. *Tree planting in organic soils does not result in net carbon sequestration on decadal timescales*. Glob Change Biol. 2020. 26: 5178– 5188.
29. Smith, C.C., et al., *Old-growth forest loss and secondary forest recovery across Amazonian countries*. Environmental Research Letters, 2021. 16(8).
30. Di Sacco, A., et al., *Ten golden rules for reforestation to optimize carbon sequestration, biodiversity recovery and livelihood benefits*. Glob. Change Biol., 2021. 27: 1328-1348
31. Lewis, S. L., Wheeler, C. E., Mitchard, E. T. A., & Koch, A. *Regenerate natural forests to store carbon*. Nature, 2019. 568, 25–28.
32. World Resources Institute (2014) *Atlas of Forest and Landscape Restoration Opportunities*. [online] Available at: <https://www.wri.org/data/atlas-forest-and-landscape-restoration-opportunities>. [Accessed 22 Feb. 2023].
33. Turkelboom, F., et al., *When we cannot have it all: Ecosystem services trade-offs in the context of spatial planning*. Ecosystem Services, 2018. 29: p. 566-578.
34. Lupp, G., et al., *Stakeholder Perceptions of Nature-Based Solutions and Their Collaborative Co-Design and Implementation Processes in Rural Mountain Areas—A Case Study From PHUSICOS*. Frontiers in Environmental Science, 2021. 9.
35. Cottrell, C., *Avoiding a new era in biopiracy: Including indigenous and local knowledge in nature-based solutions to climate change*. Environmental Science and Policy, 2022. 135: p. 162-168.
36. Kolokotsa, D., et al., *On the impact of nature-based solutions on citizens' health & well being*. Energy and Buildings, 2020. 229.
37. Epple, C., et al., *Managing ecosystems in the context of climate change mitigation: a review of current knowledge and recommendations to support ecosystem-based mitigation actions that look beyond terrestrial forests*. CBD Technical Series, 2016 (No.86): p. 55 pp.
38. Zingraff-Hamed, A., et al., *Stakeholder mapping to co-create nature-based solutions: Who is on board?* Sustainability (Switzerland), 2020. 12(20): p. 1-23.
39. de Vos, A., & Schwartz, M. W., *Confronting parachute science in conservation*. Conservation Science and Practice, 2022. 4(5), e12681. <https://doi.org/10.1111/csp2.12681>
40. Elias, M., et al., *Ten people-centered rules for socially sustainable ecosystem restoration*. Restor Ecol, 2021. 30: e13574. <https://doi.org/10.1111/rec.13574>
41. Raymond, C.M., et al., *A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas*. Environmental Science and Policy, 2017. 77: p. 15-24.
42. United Nations, E.C., Food and Agricultural Organization of the United Nations, et al., *System Of Environmental-Economic Accounting 2012: Experimental Ecosystem Accounting: Central Framework*. United Nations: New York. 2014.
43. van der Linde et al. *Environment and host as large-scale controls of ectomycorrhizal fungi*. Nature. 2018; 558: 243-248.
44. Suz LM, et al., *Ectomycorrhizas and tipping points in forest ecosystems*. New Phytologist, 2021. 231, 1700–1707
45. Heilmann-Clausen, J., et al., *A fungal perspective on conservation biology*. Conservation Biology, 2015. 29(1): p. 61-68.
46. Black, R., S.G. Laird, and L. Perez-Mujica, *Using residents' attitudes, knowledge and behaviours to improve biodiversity conservation in an Australian rural-urban landscape*. Rural Society, 2017. 26(3): p. 197-209.

47. Royal Botanic Gardens, Kew (n.d.). **Resources for restoring Brazilian Atlantic Rainforest** | Kew. [online] Available at: <https://www.kew.org/read-and-watch/resources-restoring-brazilian-atlantic-rainforest> [Accessed 22 Feb. 2023].
48. IUCN, **Guidance for using the IUCN Global Standard for Nature-based Solutions**. 2020.
49. Ryan, C.M., et al., **Ecosystem services from southern African woodlands and their future under global change**. Philosophical Transactions of the Royal Society B: Biological Sciences, 2016. 371(1703).
50. CBD (2022) **Kunming-Montreal Global biodiversity framework**, available at Available at: <https://prod.drupal.www.infra.cbd.int/sites/default/files/2022-12/221222-CBD-PressRelease-COP15-Final.pdf>. [Accessed 22. Feb 2023]
51. Muller, S. and Robins, N., **Just Nature: How finance can support a just transition at the interface of action on climate and biodiversity**. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. 2022.
52. Rabarivola, L., Razanajatovo, H., Razafiniary, V., Rasolohery, A., Ralimanana, H. & Vorontsova, M. **Madagascar Grass Atlas**. 2019.
53. Shah, L., Dowling, P., France, J. and Martyn, D. (2022). **Darwin Initiative, Darwin Plus and Illegal Wildlife Trade Challenge Fund scheme evaluation. Monitoring and evaluation: Insights and recommendations**. Available at: <https://www.darwininitiative.org.uk/assets/uploads/Monitoring-Evaluation-and-Learning-Report-Publishable.pdf> [Accessed 22 Feb. 2023].
54. Royal Botanic Gardens, Kew (n.d.). **Landscape Ecology Programme: Nature Unlocked at Wakehurst | Kew**. [online] Available at: <https://www.kew.org/science/our-science/projects/landscape-ecology-programme> [Accessed 23 Feb. 2023].
55. Sky, **Sky Rainforest Rescue WWF Impact Report**. (n.d.) [online] Available at: <https://www.skygroup.sky/reports> [Accessed 24 Feb. 2023]

Authors

From RBG Kew: Rebecca Roberts, Thomas Robson, Lottie Chapman, Chris Zacharia, Justin Moat, Kay Pennick, Kate Hardwick, Ted Chapman, Elinor Breman, Rachel Purdon, Lorraine Lecourtois, Laura Martinez-Suz, Steven Bachman, Carolina Tovar, Ed Ikin, Paul Wilkin, Laura Turner Laing and Frances Teehan.

Acknowledgements

We would like to thank the following people for their contributions.

At RBG Kew, thanks to Kew Science and those working on Nature Unlocked: the Landscape Ecology Programme at Wakehurst, whose scientific work Sky supports.

At the Institute for Human Rights and Business, thank you to Haley St. Dennis and John Morrison for human rights insights.

Thank you to Nick Robins at the Grantham Research Institute on Climate Change and Environment, LSE.

Thanks to Julia Purcell and the team at Wilton Park for hosting an event at the Just Transition Dialogue and the insight the conversation brought.

The creation of this document is a result of our ongoing partnership with Sky. As a business committed to net zero by 2030 and understanding the role of nature-based solutions, RBG Kew have been delighted to continue to work with Sky to explore how different organisations can approach investing in nature for net zero and beyond.

Citation

Roberts, R et al., Ten Guiding Principles for Investing in Nature. RBG Kew. 2023.