

An aerial photograph showing a lush green mangrove forest bordering a vibrant turquoise lagoon. The water's color transitions from deep blue to light turquoise near the shore, indicating shallow depths and healthy coral reefs. The surrounding land is a mix of dense green trees and open, grassy fields.

# NATURE-BASED SOLUTIONS FOR CLIMATE CHANGE

JULY 2020

# BACKGROUND

The rate of climate change and its impacts are accelerating and we are far from being on track from the maximum 1.5°C change that science recommends<sup>1</sup>.

There are approximately one billion highly vulnerable people facing high risks to their safety and welfare from the adverse impacts of climate change. The people at greatest risk are low-income communities dependent on local natural resource systems. In parallel, we are losing ecosystems and

their contributions to human well-being at an unprecedented rate. The current rate of nature loss is many times higher than the naturally occurring 'background' extinction rate<sup>2</sup>.

This alarming trend not only contributes to climate change but also is magnified by its impacts. In short, the challenges of land degradation, biodiversity loss and global warming are fundamentally entwined, as are their solutions.

Recently, both public and private institutions and the international community have begun to seriously consider Nature-based Solutions for climate change as a key component in addressing the climate emergency, alongside the needed transformations in our energy, urban, and industrial systems as pointed out by IPCC 1.5°C report.

In terms of their contribution to mitigation, the recent IPCC report notes that agriculture, forestry, and other land use (AFOLU) accounted for 24% of global greenhouse gas emissions in 2010, which should also account for the important oceans' contributions being estimated by science<sup>3</sup>.

Reducing these greenhouse gas emissions from AFOLU while simultaneously using the land sector to remove CO<sub>2</sub> from the atmosphere is critical to limiting warming to 1.5°C threshold. Other accounts postulate that Nature-based Solutions for climate mitigation could reach 30% of the world's mitigation potential<sup>4</sup>.

If applied in an accelerated manner while delaying necessary action in the energy system, up to 37% of 2°C (not 1.5°C) compliant global climate mitigation<sup>5</sup>.

Meanwhile, using ecosystems can be a cost-effective and more sustainable way to reduce people's vulnerability to climate change impacts while maintaining or restoring local, regional and/or global ecosystem services<sup>6</sup>.

However, a variety of challenges exist for the potential of Nature-based Solutions for climate change to be unleashed, benchmarked and sustainably financed. As WWF has gathered significant experience in developing Nature-based Solutions in various regions and countries, we see 2020 as a key moment to scale up advocacy on this issue in the climate and biodiversity spaces.

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<sup>1</sup> IPCC. Special Report on Global Warming of 1.5°C. (2018)

<sup>2</sup> WWF. Living Planet Report 2018. <https://www.worldwildlife.org/pages/living-planet-report-2018>. IPBES. IPBES Global Assessment. (2019).

<sup>3</sup> [https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc\\_wg3\\_ar5\\_summary-for-policymakers.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_summary-for-policymakers.pdf)

<sup>4</sup> Griscom, B. et al. We need both natural and energy solutions to stabilize our climate - Griscom - 2019 - Global Change Biology - Wiley Online Library. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.14612>. (Accessed: 14th September 2019)

<sup>5</sup> Griscom, B. W. et al. Natural climate solutions. Proceedings of the National Academy of Sciences 114, 11645–11650 (2017).

<sup>6</sup> For example, the recent report by the Global Commission on Adaptation notes that restoring mangroves that protect from sea level rise and storm surges is 2-5 times cheaper than building engineered structures.

# DEFINITION

For WWF, Nature-based Solutions for climate change are:

“Ecosystem conservation, management and/or restoration interventions intentionally planned to deliver measurable positive climate adaptation and /or mitigation benefits that have human development and biodiversity co-benefits managing anticipated climate risks to nature that can undermine their long-term effectiveness.”

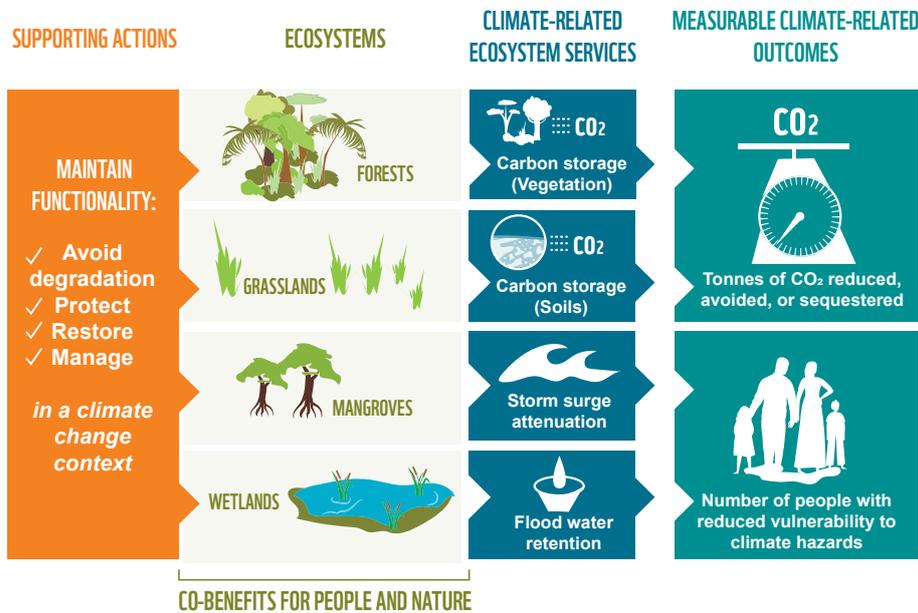


Figure 1. An illustration of WWF's definition of Nature-based Solutions to climate with some examples

Source: WWF, 2019. Note that it is an illustration using some examples. Key ecosystems such as seagrasses and coral reefs are missing.

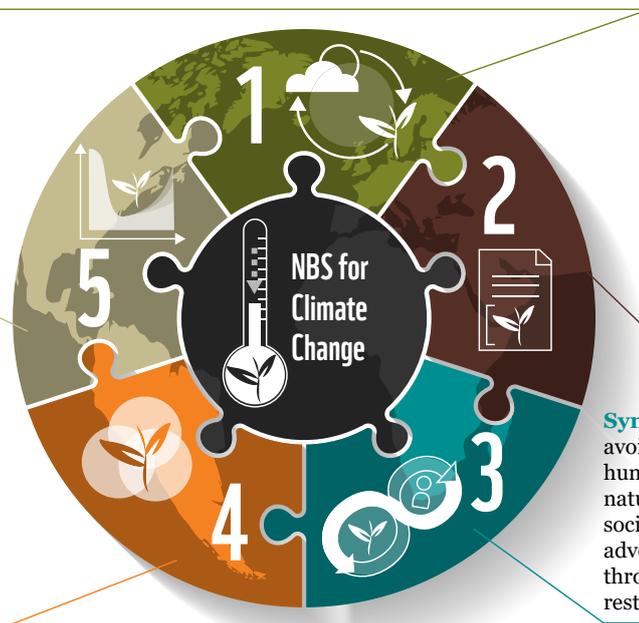
# PRINCIPLES

To meet the definition stated earlier, WWF has identified 5 key principles for Nature-based Solutions for climate change.

**Result in increased climate ambition and ecosystem functionality.** Nature-based Solutions interventions contribute increased climate change adaptation and/or mitigation rather than compensating for low ambition in other sectors, ensuring that needed energy, food, urban and infrastructure net zero transformations support one another. Improving ecosystem functionality involves assessing how climate change will affect nature and taking steps to better manage these risks.

**Measurable and traceable:** Outcomes can be quantified and attributed to interventions through robust monitoring, evaluation and reporting frameworks.

**Co-designed and co-implemented with Indigenous Peoples and local stakeholders** as both a way to understand their most pressing challenges as well as building co-responsibility.



**Informed by science:** uses the best available climate, biological and social sciences to set achievable and measurable targets.

**Synergistic:** Help reduce and/or avoid emissions and/ or reduce human vulnerability while conserving nature and trade-offs among other societal goals as well as avoiding adverse impacts on biodiversity e.g. through broad, single-species restoration.

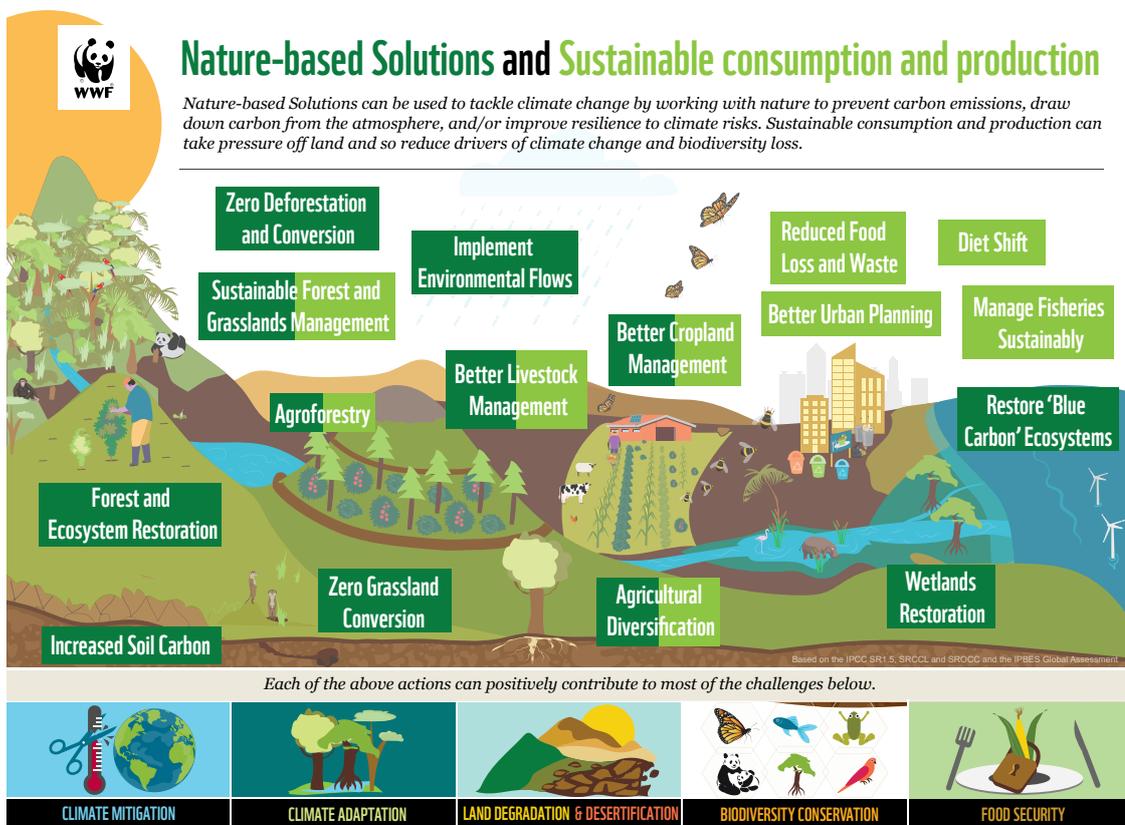
# SYNERGISTIC INTERVENTIONS & OUTCOMES

WWF supports a synergistic approach to Nature-based Solutions that prioritises people while maximizing benefits to nature in the global race to curtail and adapt to climate change. Recent work by IPCC and IPBES provide frameworks for understanding Nature-based Solutions that best meet WWF’s synergistic vision.<sup>8</sup>

These interventions, chosen as those that contribute to multiple societal goals without significant tradeoffs, are listed and illustrated in **Figure 2 below**.

Nature-based Solutions can also substitute for, or complement, more traditional engineered solutions. Engineered solutions generally provide a single benefit, and often influence other resources, and require continued maintenance and eventual replacement. In contrast, Nature-based Solutions provide the primary benefit and a range of co-benefits

and often require less maintenance over time as they rely on the regenerative processes of nature. For example, levees and floodwalls provide a single benefit, impact river-floodplain ecosystems, and require considerable long-term maintenance (much of the developed world now faces a considerable challenge of backlogged maintenance of levees). In contrast, Nature-based Solutions for flood management can reduce flood risk while benefiting water quality, nutrient sequestration, biodiversity and open space and require less maintenance over time.



**Figure 2. Synergistic Nature-based Solutions**

Source: *Climate, Nature & our 1.5°C Future; A Synthesis of IPCC and IPBES Reports*. WWF. 2019.

Solutions shown have been found by IPCC and IPBE to contribute to a number of the five societal challenges listed at the bottom of the figure.

<sup>8</sup> There are a range of additional sources that provide typologies such as the World Bank, the European Environmental Agency, UNEP, and UN Water as well as the Nature Based Solutions Initiative spearheaded by the University of Oxford that includes a tool.

# BARRIERS & TRADE-OFFS

While Nature-based Solutions are physical conservation, restoration and management interventions, they can be facilitated by institutional, management or policy decisions and arrangements that run from local to global scales.

The science is also clear that Nature-based Solutions face many barriers to implementation, including technological, institutional, socio-cultural, and geophysical. Many nature-based solutions for climate mitigation depend on the continued CO<sub>2</sub> sink function of Nature-based Solutions, but carbon removal through Nature-based Solutions can be impermanent and reversible with future climate change due to fire, pests, changes in management regimes, or ecosystem collapse<sup>9,10</sup>. Furthermore, many Nature-based Solutions - especially for mitigation - are land-intensive. Large-scale

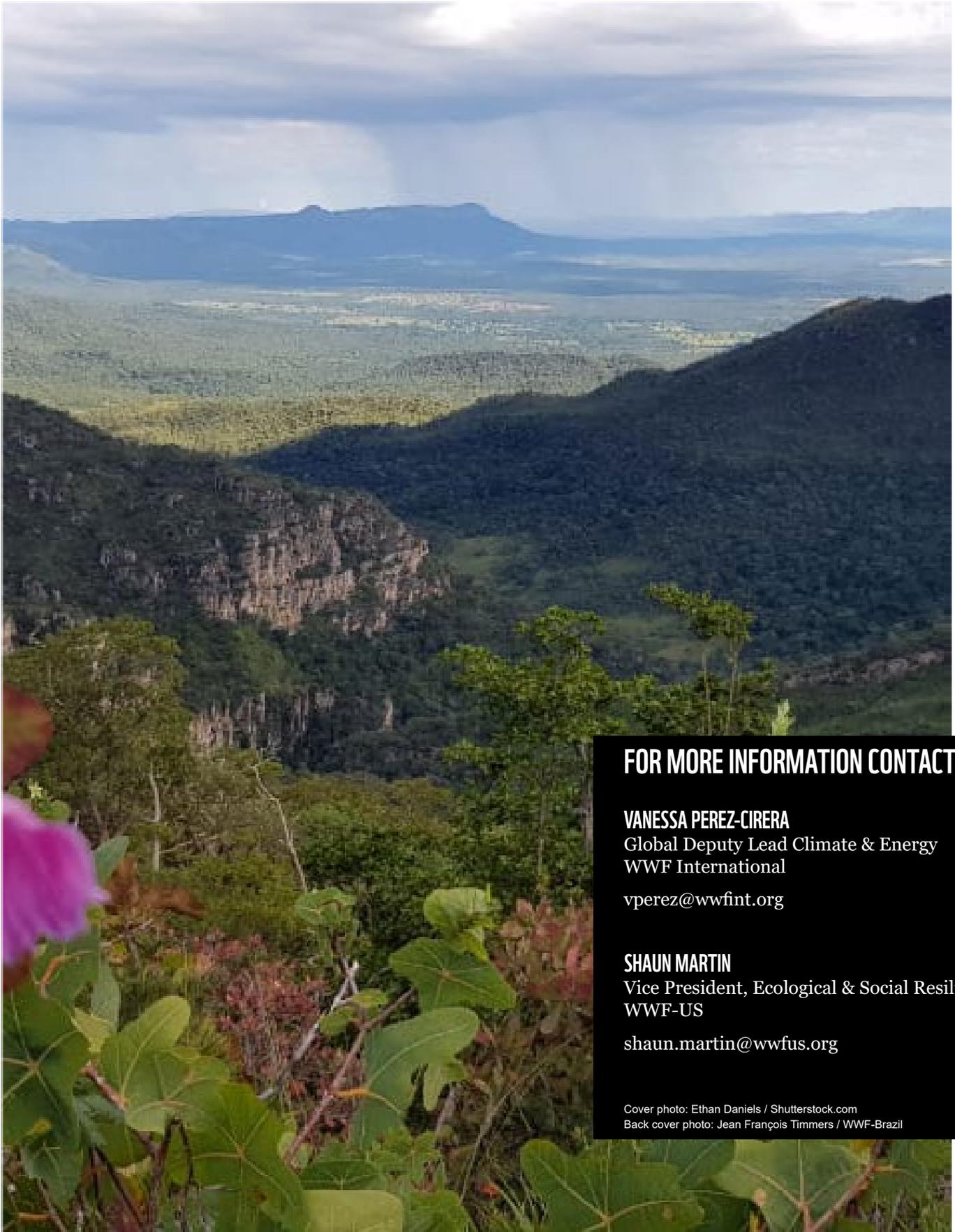
Nature-based Solutions will need to be applied in tandem with measures that reduce pressure on land like changes to food, dietary, and agricultural systems; otherwise land use conflicts may arise. Given the historic propensity for marginal communities to withstand the worst of land use changes and climate change, the social costs of Nature-based Solutions could be negative if not designed inclusively with affected stakeholders. In addition to these, barriers preventing greater adoption of Nature-based Solutions for adaptation include the potential limitations of ecosystem services under a changing climate; difficulty in monitoring, evaluation, and establishing the evidence base for effective interventions; and varying social and cultural perceptions of climate risks and what acceptable interventions might be.

## WWF WORKS WITH A VARIETY OF PARTNERS TO:

- Elevate the role of Nature-based Solutions for climate adaptation and the need for increased public and blended finance to **reach the most vulnerable communities.**
- Working with IUCN in **developing and piloting the Nature-based Solutions Standards.**
- Provide **practical guidance** for countries to include Nature-based Solutions in their **Nationally Determined Contributions (NDCs).**
- Propose ways to **align concepts, measures and safeguards** between the **United Nations Framework for Climate Change (UNFCCC)** and the Post-2020 Framework for the **Convention on Biological Diversity (CBD).**
- Develop **science-based guidance for synergistic interventions.**
- Identify **policy, governance and financial solutions to sustainably fund and scale projects.**
- Work with **local communities and Indigenous Peoples groups to design and develop best in class projects that benefit climate, nature and people.**

<sup>9</sup> <https://www.sciencedaily.com/releases/2018/11/181120073635.htm>

<sup>10</sup> <https://science.sciencemag.org/content/364/6444/932/tab-pdf>



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