

A full-page photograph of a mangrove forest. A person stands in a small boat in the center of a narrow waterway, flanked by large, leafy mangrove trees. The water reflects the trees and the person. The sky is visible through the canopy.

HOW TO DESIGN HIGH-QUALITY NBS FIELD PROJECTS: **A GUIDE FOR PRACTITIONERS**

Version 1: January 2022

“Nature underpins every person’s wellbeing and ambitions – from health and happiness to prosperity and security. People need to better understand the full value of nature to ensure its protection and sustainable use.”

Sir Robert Watson,
former IPCC and IPBES chair, 2018

About WWF:

WWF is an independent conservation organization, with more than 5 million supporters and a global network active in over 100 countries. WWF’s mission is to stop the degradation of the Earth’s natural environment and to build a future in which humans live in harmony with nature, by conserving the world’s biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

More information at www.panda.org/climateenergy

How to design high-quality NbS field projects:
A guide for practitioners.
Version 1

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ABOUT THE GUIDEBOOK

There is increasing donor attention to the concept of nature-based solutions (NbS), with little clarity on how these differ from “business as usual” conservation and how to go about developing them. The purpose of this document is to provide WWF staff with practical guidance on how to do so. An explicit intention is not to repeat what other guidance provides, but rather to point WWF staff towards the most valuable guidance and resources.

This document is NOT meant to be a definitive authority on “NbS” but rather a starting point for those with limited experience on the topic and aims to simplify the myriad documents and papers available on the core elements required to identify, design and implement good NbS.

This document aims to:

- a. Provide an overview of nature-based solutions and WWF’s approach to them;
- b. Provide practical and simplified guidance for WWF practitioners to develop and implement high-quality nature-based solutions interventions;
- c. Point to useful documents and where supporting information can be found
- d. Emphasize the inclusion of stakeholders, especially Indigenous Peoples’ and Local Communities in identification, design and implementation of nature-based solutions;
- e. Emphasize consideration of climate risks to people and biodiversity, as well as continuing to address non-climatic threats.

This document will be revised and updated on a regular basis to take new information and learnings into account.

SECTION I: CONCEPTUALIZATION

2. UNDERSTANDING NATURE- BASED SOLUTIONS

A. DEFINING NATURE-BASED SOLUTIONS

Nature-based solutions are interventions that are designed explicitly to address major societal challenges by using nature (ecosystems and ecosystems services) sustainably. The societal challenges initially considered are: food security, climate change, water security, human health, disaster risk and social and economic development.¹ Late in 2020, IUCN included ecosystem degradation and biodiversity loss as a 7th societal challenge, however, according to the IUCN Global Standard on nature-based solutions, this challenge cannot be addressed in isolation and at least one of the listed societal challenges must be addressed in the same intervention. NbS are aimed at providing societal benefits through sustaining or delivery of ecological goods and services, synergistically improving human well-being and improving the state of the biodiversity being used.

The concept of nature-based solutions has gained recognition in the past decade as an overarching concept embracing a set of similar, and at times overlapping, concepts, including: green and blue infrastructure, ecosystem-based adaptation, carbon storage and sequestration, ecological / natural infrastructure, urban forests, ecological restoration. Nature-based solutions refers specifically to place-based interventions, as opposed to policy actions, and can be applied in both rural and urban environments.

Nature-based solutions also need to be context appropriate, in terms of: biodiversity / nature (ie. that is indigenous and appropriate for the ecosystem); the people (ie. what is appropriate for the primary stakeholders and stewards as determined by themselves, especially Indigenous Peoples and Local Communities (IPLCs), and experienced and projected climate changes (ie. nature-based solutions should not exacerbate vulnerability or cause maladaptation). It is critical for WWF that any NbS intervention uphold and support IPLCs rights, and that interventions add value to IPLCs. As a minimum, as with all WWF interventions, they must “do no harm”. It is also important to be aware that there is often a possibility of trade-offs in NbS interventions, between local and global good, between government and rural communities, also between one societal challenge and another.

Critically, it is important to distinguish nature-based solutions from business-as-usual conservation work. Conservation focuses on securing nature and biological diversity, using a range of approaches including protected areas, species conservation, and policy and advocacy to ensure that species and nature survive and thrive. Nature-based solutions’ focus is on using nature sustainably to help people by addressing specific societal challenges, while securing the long-term source of those benefits: nature. There are certainly overlaps between the two: NbS is an approach that can be used in conservation, and conservation action is essential to maintain the nature used in NbS. However, they are not synonymous, and we should be wary of repackaging our conservation work as “nature-based solutions”. NbS interventions must be explicitly designed to address an identified societal challenge measurably and be able to show how this is happening through monitoring of robust indicators. In essence, NbS is a tool for social development that has biodiversity benefits, it is a tool to safeguard people and nature synergistically.

WWF is involved in numerous NbS interventions, and many of our WWF Practices are including nature-based solutions as an integral piece of their initiatives. This includes work on [Urban NbS](#); [Freshwater](#), [Forest](#), [Food](#), [Markets](#), [Governance](#), [Climate](#), [Oceans](#), and [Wildlife](#). Contact the respective Practices and Regional Offices to understand what NbS interventions are already underway.

¹ IUCN (2021). Nature-based Solutions for people and planet. Available at: <https://www.iucn.org/theme/nature-based-solutions>

I. BRIEF HISTORY

The development of the concept of nature-based solutions is often seen as relatively new, however, it has been a process that started more than 10 years ago (See Figure 1). Institutions such as the World Bank (which first used the term in a report in 2008), the European Commission, IUCN amongst others, have played a key role in the development of the concept.

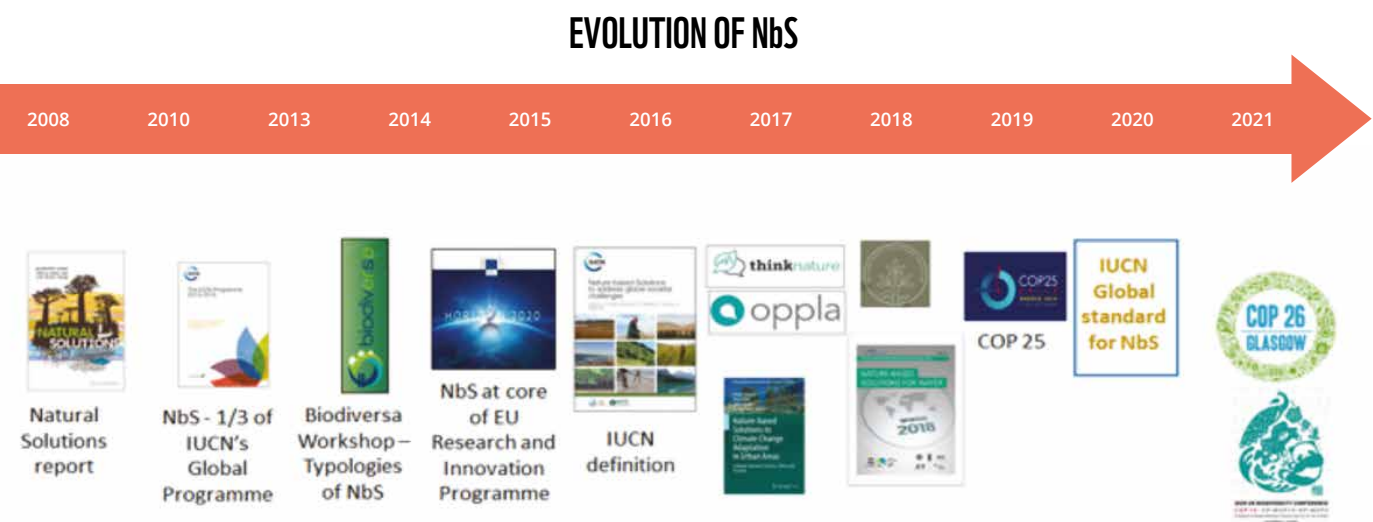


Figure 1
The Evolution of NbS
Source: Own contribution

The year 2019 marked a turning point in leveraging the use of nature-based solutions. First, at the UN Climate Action Summit in New York, the UN Secretary General prompted transformative changes in support of NbS; and later at the COP25 in Madrid, the momentum revolving nature-based solutions kept gaining traction for its cost-effective potential to address society’s global challenges such as climate change and as a robust solution to increase investments in nature for societal benefit. All these efforts were expected to consolidate the use of nature-based solutions in 2020, which was believed to be a super year for nature with the CBD COP15 in China, and COP26 in the United Kingdom². Unfortunately, with the recent unexpected outcome of events due to COVID-19, all major gatherings were postponed until 2021- some until 2022, leaving extra time for organizations to arrive in 2021 with new proposals and insights. The pandemic and its devastating effect on the economy has in turn increased attention to the drivers that triggered this crisis. In response to this economic catastrophe, many governments have introduced job retention or social protection measures for their citizens at an unprecedented scale while also pushing forward with massive economic ‘stimulus’ or ‘recovery’ measures. This presents an opportunity to emphasize the importance of nature and of nature-based solutions in making economies more resilient and in “building back better”. The **Nature Hires** report elaborated by WWF and the International Labour Organization illustrates a series of examples to deploy nature-based solutions in a way that spurs job creation while contributing towards the achievement of other Sustainable Development Goals (SDGs).

² Nature4Climate (2020). NbS Briefing Room. Available at: <https://nature4climate.org/NbS-briefing-room/>

ACTIONS TO PROTECT, SUSTAINABLY MANAGE, AND RESTORE NATURAL OR MODIFIED ECOSYSTEMS, THAT ADDRESS SOCIETAL CHALLENGES EFFECTIVELY AND ADAPTIVELY, SIMULTANEOUSLY PROVIDING HUMAN WELL-BEING AND BIODIVERSITY BENEFITS

The momentum generated internationally to address the climate and biodiversity crisis has prompted ambition in major economies such as France and UK that announced early in 2021 at the **One Climate Summit** they would allocate 30% of their climate budget towards NbS. While we would like to see a net increase in climate and nature-based solutions public funding and not a reallocation of already strained resources towards equally desired agendas, these commitments do signal government’s interest in the topic, as well as an increased foreign aid agenda towards a sector that promises to deliver synergistic climate-nature-development impacts.

It is important to recognize that **nature-based solutions is still an evolving concept**, and not cast in stone. As Figure 1 displayed, the concept has evolved over the past 10 years, and will continue to be shaped in the coming years.

II. IUCN DEFINITION AND SITUATING NATURE-BASED SOLUTIONS AMONGST RELATED APPROACHES

IUCN defines nature-based solutions as, “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”.

Each country and donor agency may well have, or develop, its own definition of nature-based solutions, and this is important to understand when seeking to influence national policies and strategies, or when seeking for NbS funds. For example, the European Commission (EC) definition is “solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience”. This differs from the IUCN definition in that it includes “nature-inspired” solutions, which IUCN does not (please refer to Figure 2). Figure 1 provides guidance as to the differences between “nature-based solutions”, “nature derived” and “nature inspired”. The EC definition often considers biomimicry as nature-based solutions and this is one of the main differences with the IUCN definition.

Understanding differences Nature-based vs. Nature derived vs. Nature inspired		
Nature-based Solutions	Nature derived	Nature inspired
Solutions based on nature use the power of functioning ecosystems as infrastructure to provide natural services to benefit society and the environment.	Wind, wave and solar energy are derived from nature. In this case, they are solutions to help fulfil our low carbon energy needs through production methods deriving from natural sources. These energy sources come from the natural world but are not directly based on functioning ecosystems.	Innovative design and production of materials, structures, and systems that are modelled on biological processes are nature-inspired. For example, biomimicry is a practice that learns from and mimics the strategies found in nature to solve challenges. These designs take inspiration from nature – such as specially made sticky gloves that mimic the wall climbing adaptations of geckos. They are not based on functioning ecosystems.

Figure 2.
Understanding differences between using NbS
Source: IUCN - website: <https://www.iucn.org/theme/nature-based-solutions/about>

III. WWF PRINCIPLES FOR NATURE-BASED SOLUTIONS

IUCN has developed a Global Standard of nature-based solutions that builds a common language and understanding while ensuring quality of the interventions. The Global Standard was published in 2020 and is comprised of eight criteria and twenty-eight indicators. WWF suggests following the Global Standard in the design of NbS (please refer to Section 3). For WWF, nature-based solutions interventions must explicitly incorporate the following core components:

1. Be a place-based intervention that uses the functioning power of ecosystems;
2. Explicitly address one or more of the identified societal challenges. This means that we need to be able to measure and report on how we are addressing the identified societal challenges and have well-defined indicators against which we monitor progress. (refer to Table 5 for possible indicators). (Criteria 1 of the IUCN Standard);
3. Use nature sustainably; and improve biodiversity. Nature-based solutions rely on healthy ecosystems and aim to improve the conditions of the ecosystem and biodiversity, which is also referred to as biodiversity net gain. They should be designed and implemented according to scientific and conservation principles. The contribution to biodiversity must also be measurable against robust indicators. (Criteria 3 of the IUCN Standard);
4. Consider the co-benefits and trade-offs of the nature-based solutions for people and biodiversity. Co-benefits are understood as everything that we are not prioritizing for, which can be found in other societal challenges, or by observing the many ecosystem services/ nature’s contribution to people, etc. Trade-offs usually require prioritizing one benefit in a given landscape to the detriment of another. They need to be identified, and often require negotiating between different objectives, solutions, and benefits (Refer to Criteria 6 of the IUCN Global Standard and Section 3 of this document);
5. Contribute directly and tangibly to human wellbeing at the local level, if addressing the societal challenge does not do this directly. In some cases, a nature-based solution to address a societal challenge may have the potential to undermine human wellbeing at the local level. For WWF, those who are living with the biodiversity being used in the nature-based solutions, must also benefit directly / tangibly. These local benefits are context specific, but need to be identified by the people involved, and may include improved livelihoods, resilience, income, jobs, rights, access, ecosystem goods and service provision, etc. These must be planned for and explicitly identified. This is also linked to issues of scale and trade-offs (see Section 3). (Criteria 1 and 5 of the IUCN Standard). Again, these must be measurable.
6. Be designed and implemented with engagement, participation, and consent of all the stakeholders in the area of your project, especially IPLCs, youth, women, people with disabilities and other marginalized community members. Achieving sustainable and successful nature-based solutions requires that they are designed and implemented according to scientific principles (as above), and also the WWF Social Principles and ESSF” to “Achieving sustainable and successful nature-based solutions requires that they are designed and implemented according to the WWF Social Principles and Policies and ESSF, as well as scientific principles.. In many cases indigenous and traditional knowledge will be central to sustainable NbS. (Criteria 5 of the IUCN Standard);

Additionally, the following elements are also important to include:

7. Have a landscape/seascape intention and cross-sectoral and thematic approach. While nature-based solutions can be piloted at the smaller scale, to achieve impact WWF should aim to scale them to the landscape/seascape level (see Section 2 for information on landscapes-scale approach);
8. Address climate risks and impacts to both the nature underpinning the NbS and also the people in the project area and implement suitable adaptation options for the NbS intervention (“climate smart”). (Criteria 2 of the IUCN Standard);

9. Be context specific and appropriate. This refers to both the nature in question as well as to the people living in the area and whose societal challenges will be addressed. A successful NbS intervention in one place cannot necessarily be directly transplanted to other contexts and regions. Nature-based solutions results will be determined by the natural, cultural, socioeconomic and policy contexts in which they are applied;
10. Must be cost-effective in relation to other solutions (such as hard infrastructure or technological ones). While cost-effectiveness of natural solutions is often hard to quantify when using nature as compared to brick and mortar, the externalities of other fixes vs sustainably using nature must also be considered in the assessment.
11. Have the long-term perspective in mind, even if the funding is short-term.

WWF initiatives are almost always broader than nature-based solutions. For this reason, the following considerations have to be taken into account when reviewing existing WWF projects to identify existing or potential NbS elements:

- a. Most WWF initiatives are broader than only nature-based solutions, in that they include technological, conservation specific, NbS and other elements. For example, a community conservation programme which aims to contribute to socio-economic development, will also include wildlife law enforcement activities to conserve specific species, hard infrastructure (eg. rainwater tanks), nature-derived activities, such as solar power, policy work and capacity building activities. However, the whole aim of the programme is using nature to address a societal challenge. Also, nature-based solutions can be incorporated as part of a larger initiative. This does not imply that the whole project will become a nature-based solution;
- b. WWF initiatives are often designed to address one or more societal challenges as part of a larger conservation programme, with specific conservation objectives;
- c. While there is a lot of attention to nature-based solutions in donor circles currently, it does not mean we have to only implement NbS. Not all interventions are nature-based solutions and that is fine;
- d. Theories of change for nature-based solutions may be implicit in WWF initiatives; the purpose of this exercise is to make them explicit;
- e. Nature-based solutions can be a central component or one of many in a WWF intervention;
- f. Conservation work designed to address biodiversity loss is still crucial; not everything must be labeled a nature-based solution to be relevant.

Nature-based solutions is one “tool” in our programmes. Our approaches to end fossil fuel production, promote renewable energy, support adaptation to climate change and human wellbeing that do not rely on nature, and our traditional biodiversity conservation strategies, remain critical components of our work. It is also important to note that NbS can be implemented as “stand-alone” projects but are most often part of a larger strategy to address one or more societal challenges, often used together with technological or engineering solutions.

³ Note: in this case Biodiversity Net Gain refers to improving the state of biodiversity, ie. halting or reversing negative trends / state in biodiversity employed in the NbS. It does not refer to the UK Government’s stipulations that new English developments will be required to demonstrate at least a 10% increase in biodiversity on or near development sites.

⁴ Examples of climate risks and impacts: More frequent and intense drought, storms, heat waves, rising sea levels, melting glaciers and warming oceans, which can affect food and water security for both people and wildlife and destroy habitat and infrastructure.

Nature-based solutions for climate: NbS4C

Nature-based solutions that address climate are a sub-set of NbS, addressing only one of the six IUCN identified societal challenges. 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 impacts that have direct positive implications for human development and as a minimum, do not harm biodiversity.” Nature-based solutions for climate (NbS4C) includes activities on both adaptation (ecosystem-based adaptation) and mitigation.

NbS4C should be supported by other options too for both adaptation and mitigation. It is critical that we do not promote nature-based solutions alone as a means for mitigation and solution to the climate emergency. We must continue to insist that countries’ governments reduce their emissions as well as implement NbS. The WWF High Quality Supply Task Team has prepared guidance on nature-based solutions for climate mitigation (NbS-CM) interventions. The document focuses on describing principles and recommendations for WWF offices and project developers to guide their engagement in NbS-CM interventions that may include carbon credits. This guidance document also includes key considerations regarding which types of NbS-CM interventions have robust social and environmental safeguards that lead to the greatest impact in reducing emissions from forest destruction and increasing forest carbon sinks. To read the full report, [click here](#)

For WWF, nature-based solutions for climate (NbS4C) must consider five principles
- See Figure 3. (WWF, 2020)

PRINCIPLES

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

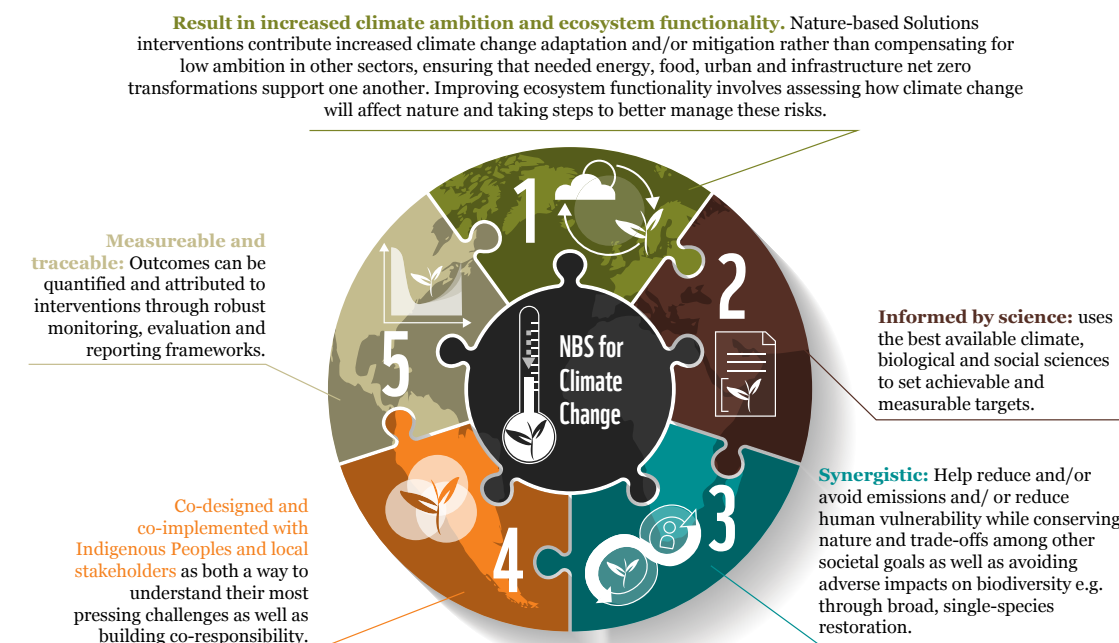


Figure 3.
Principles of nature-based solutions for climate
Source: WWF (2020). [Link](#)

WWF supports a number of climate change adaptation and mitigation NbS interventions, including mangrove restoration, riverine restoration, wetland restoration and forest carbon.

When considering a nature-based solution for climate change an aspect often overlooked is that the conditions of a given area are likely to change with climate change. For example, Figure 4 shows how the current offers for ecosystem services may evolve in different possibilities with climate change: First, the ecosystem services can persist (sustained ecosystem services); second, some other ecosystem services that were not of importance may end up providing benefits (latent ecosystem service); and lastly, new ecosystem services may emerge (novel ecosystem services)⁵.

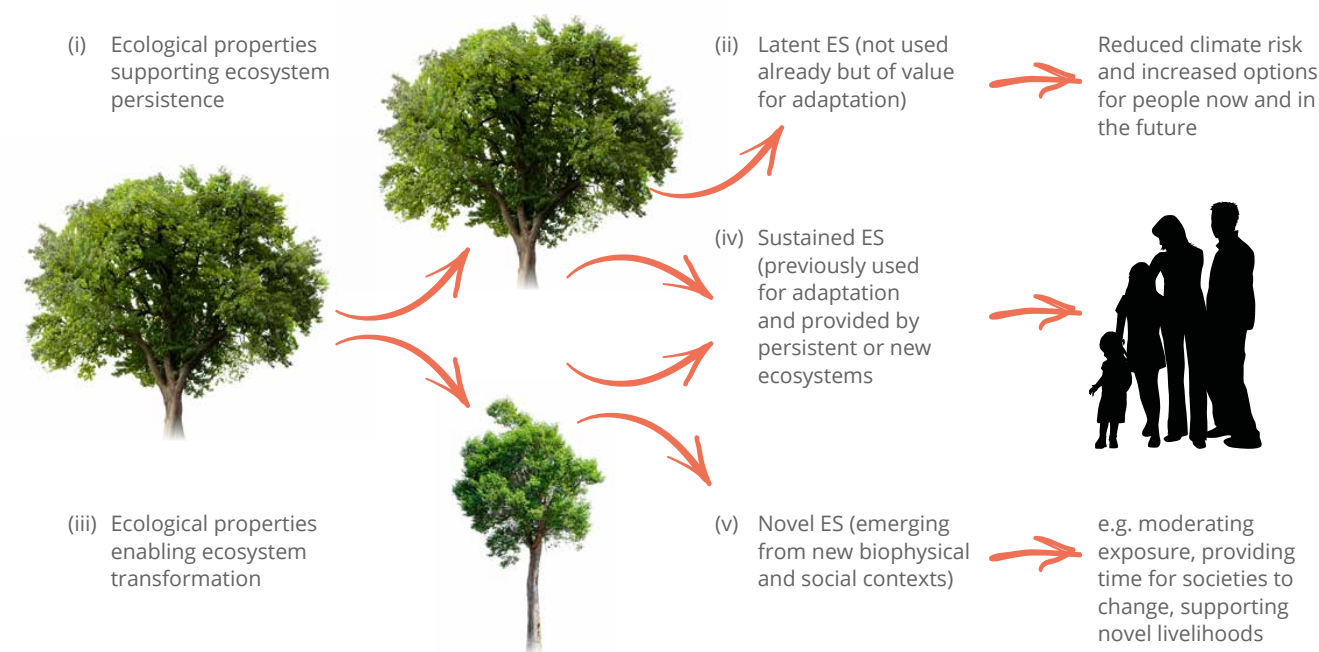


Figure 4.
Typology for Adaptive Ecosystem Services

Urban Nature-based Solutions

The European Commission (including all the funded H2020 organizations) have developed extensively the concept of urban nature-based solutions. Some of the information elaborated may differ from what we want to consider as NbS. For example, porous pavements and other sorts of green interventions are labelled as nature-based solutions.

Urban NbS is a growing area of work for WWF. There is a critical need to physically green cities and their peripheries to deliver benefits for people and nature (e.g. improving resilience to climate change, addressing urban heat island and buffering extreme weather, countering air pollution, accessing urban green spaces), as well as for cities to advocate for nature conservation in a city’s periphery and further afield. Nature-based solutions can be used to create healthy cities, equitable and green cities –where people and nature can thrive together. Urban NbS offers enormous potential for WWF to support sustainable cities, address climate change and contribute to biodiversity conservation.

The WWF Cities team has released a report highlighting how cities are leading the way on urban NbS. Read the full report [here](#).

Lavorel Sandra, Locatelli Bruno, Colloff Matthew J. and Bruley Enora (2020). Co-producing ecosystem services for adapting to climate change, Phil. Trans. R. Soc. B., 375: <https://doi.org/10.1098/rstb.2019.0119>.

IV. ILLUSTRATIVE EXAMPLES OF NATURE-BASED SOLUTIONS

Examples of nature-based solutions

There are a myriad of examples of WWF interventions that can be considered nature-based solutions. But it is important to review the interventions to ensure that they do adhere to the definition, i.e.:

- 1. What societal challenge is it explicitly and measurably contributing to and how is it improving human wellbeing (directly and co-benefits)?
- 2. What ecosystem / ecosystem service is it employing?
- 3. How is it benefitting biodiversity (directly and co-benefits) ?
- 4. What co-benefits in ecosystem / ecosystem service is it generating?

The table below shows an example.

*not definitive

CORE COMPONENTS TO DETERMINE IF A PROJECT IS NbS				
Place-based intervention Nbs	Societal challenge	Indicators to address that Societal Challenge (and to improve human	Co-benefits for people wellbeing)*	Biodiversity net gains - Nature’s Contribution to People
Agroecology approaches (agroforestry and silvopastoral systems)	Climate change	Hectares of land under improved and effective management that contributes to CO2 emission reductions; Tons of carbon reduced or avoided; Number of people (male and females) whose vulnerability is reduced by adopting climate-resilient options (including fisheries, agriculture, tourism, etc.)	Habitat for species; Climate regulation; Soil formation and protection	Trees are used as wildlife corridors, enhanced ecosystem resilient to climate change due to crop pollination and soil formation, etc
	Food security	Areas allocated for sustainable food production; Average value for sustainable food production; Number of food secure people (males and females) and/or households. Including parameters such as average intake of dietary energy supply adequacy, number of undernourishment people (male and females) reduced; Number of communities and/or farmers (males and females) adopting food security-related practices	Pollination and seed dispersal; Food and feed	
	Water security	Quantity of pollution (nutrients) and/or invasive alien species retained and/or filtered (i.e.: water quality improvement, soil moisture regulation)	Water quantity and flow regulation	
	Social and economic development	No. of people (males and females) and/or households whose income has increased, jobs were generated, or trained; Number of people (males and females) and/or communities to have increased livelihood diversification; Social, environmental, economic co-benefit index/indicator at impact level	Materials and assistance; Maintenance of options	

Source: Own contribution

The WWF Effort Mapping exercise collated the nature-based solution interventions that the network is implementing. The following are examples of WWF interventions that could be considered in as NbS interventions, and some of the societal challenges that they can address:

EXAMPLES OF NbS INTERVENTIONS	EXAMPLES OF SOCIETAL CHALLENGES ADDRESSED <i>(note each example may address more than the challenges listed below)</i>
Agroecology approaches (agroforestry and silvopastoral systems)	Food security, water security, climate change, biodiversity degradation, and socio-economic development
Protecting, reconnecting, or restoring floodplains	Water security, disaster risk reduction
Protection, restoration, enhancement or construction of wetlands	Water security, disaster risk reduction
Upper watershed restoration and management	Water security, disaster risk reduction
Maintenance or restoration of sediment transport	Food security, water security
Sustainable use of natural resources to improve livelihoods and food security (eg. community-based wildlife or forest management)	Socio-economic development, food security
Protection or restoration of riparian vegetation	Disaster risk reduction, climate change adaptation,
Reforestation / Afforestation	Climate change mitigation
Integrating mangroves and fisheries farming	Food security, climate change adaptation
Ecosystem-based fishery management	Food security
Planting aquatic plants in polluted water bodies to improve water quality and boost inland fisheries	Water security, food security

Some other examples can be considered NbS interventions, but it is important to take into consideration the core components in part iii:

- Urban and peri-urban forests;
- Clearing out invasive alien species and allow natural regeneration maintaining the functionality of the ecosystem;
- Ecotourism.

In most of these cases however, WWF projects do not have clear indicators against which to evaluate whether they are indeed addressing a particular societal challenge. In this case, such indicators need to be developed to clearly show how the intervention is addressing a societal challenge (Table 5).

WWF is involved in numerous nature-based solution interventions. Contact the respective Practices and Regional Offices to understand what NbS interventions are already underway. Below are illustrative examples of WWF NbS interventions, taken from the 2020 WWF Effort Mapping Exercise.

⁵ Lavorel, S., Locatelli, B., Colloff, M. and Bruley, E. (2020). Co-producing ecosystem services for adapting to climate change. Philosophical Transactions of the Royal Society B, Vol. 375, pp-

⁶ The IUCN Global Ecosystem Typology is a classification framework for Earth's ecosystems: <https://global-ecosystems.org/>

⁷ To see full list of Nature’s Contribution to People, click on this [link](#)

Name of the project	Field based interventions	Societal challenge being addressed	Indicators to address the societal challenge and contribute to human wellbeing (Table 5)	Specify ecosystem services ⁸	Biodiversity net gains
Smart Coast by WWF Mexico	Restoration of coastal ecosystems: mangroves, coral reefs, seagrass beds, coastal sand dunes; co-management of fisheries and agroforestry	Climate Change	<i>Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.):</i> Reduce climate change vulnerability of xx coastal communities in selected coastal and marine protected areas in four countries	Habitat to species, climate regulation, ocean acidification, water quantity and regulation, soil formation and protection, hazard regulation, food and feed, materials, experiences, and identity	Protection and restoration of the habitat of key species
Large MPA in Northeast Palawan by WWF Philippines	Design marine reserves to improve long term benefits with ecosystem-based fishery management	Food Security	<i>Number of communities and/or farmers adopting food security-related practices:</i> Local communities of about 5,000 households and indirectly with food security, about 200,000 fishers in surrounding communities.	Habitat to species, climate regulation, ocean acidification, water quantity and regulation, food and feed, learning and inspiration, experiences and identity	Stable reef condition, stable populations of marine wildlife (i.e.:sharks, rays, turtles, seabirds, dugong, whales, dolphins, reef food fish, invertebrates)
Dynamic Life-Lines Danube by WWF Austria	Watershed restoration including floodplains and river beds	Disaster-risk reduction	<i>Quantity of urban/farms/floodplains /river banks/other areas secured:</i> 25 km of restored side-arms and river-banks, 1.500 hectares of restored floodplain forests	Habitat to species, air quality regulation, water quantity and regulation, hazard	Increase of populations of endangered fish-, insect-plant -species regulation

Table 2.
Case studies of nature-based solutions from WWF
Source: WWF Effort Mapping

⁸ Nature's Contribution to People framework. Available here: <https://www.pnas.org/content/117/51/32799/tab-figures-data>



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Challenges identified in this mapping exercise included:

- Confusion between actions that are not NbS and NbS, for example, renewable energy projects;
- Presenting a conservation programme as nature-based solutions because it has potential societal co-benefits (i.e.: “indirect benefits to food security”);
- Few measurable indicators to show evidence of contribution to societal challenges, and even in some cases, to biodiversity;
- No cost-effectiveness analysis;
- Incomplete data.

EXAMPLES OF INTERVENTIONS THAT ARE NOT NATURE-BASED SOLUTIONS

As explained above, actions that are inspired in nature, or methods derived from natural systems are not considered NbS. Here is a list of actions that should not be labelled as NbS:

- x Renewable energy: Wind, wave and solar energy are derived from nature, but do not use an ecosystem to generate services. These energy sources come from the natural world but are not directly based on functioning ecosystems.
- x Porous pavements and similar green infrastructure: The design of infrastructure that learn from and mimics (biomimicry) the strategies found in nature to solve challenges, but do not rely on an ecosystem to generate services. While the EU definition does include these, the IUCN one does not.
- x Wildlife species conservation programmes - unless part of an ecosystem protection programme which is aimed explicitly at addressing a societal challenge.
- x Wildlife crime actions – unless as above.
- x Forest plantations – even when being used to reduce pressure on natural forests.
- x Phasing out fossil fuels.
- x Plastic clean ups.
- x Governance support, including institutional development, etc.
- x Capacity building activities.
- x Environmental education programs (NOTE: for the EU, these are considered NbS)
- x Policy and advocacy work: while often critical to enabling NbS, they in themselves are not NbS.

“However, some of the above programmes may also be included in or components of a NbS, as there are many nuances in NbS”. These can be clarified through the use of the IUCN Global Standard.

SECTION II: IMPLEMENTATION

3. DESIGNING NATURE- BASED SOLUTIONS

A. GETTING STARTED

Before embarking on the design of a new nature-based solution intervention, contact the respective Practices and Regional Offices to understand what NbS interventions are already underway.

Bear in mind that different groups have varying reasons for being interested in NbS, such as to manage their resources in their customary ways, for their development opportunities, to meet biodiversity objectives, to meet climate targets, and / or to offset activities which negatively affect climate, nature and people. Each will have different objectives and interests and it is important to understand the nuances of these different aims.

Whether designing new NbS interventions, or assessing if an existing intervention is a NbS, it is recommended to do a rapid assessment of the intervention:

Stop / Go:

- If the intervention is not an actual place-based project, it is not a nature-based solution - See Section I, part iv for more examples;
- If the intervention does not explicitly address one or more of the societal challenges challenges and contribute directly to human wellbeing, it is not considered a nature-based solution for WWF - See Figure 5 for a list of indicators;
- If the intervention does not provide co-benefits to people which can be found in ecosystem services or nature’s contribution to people, it is not a nature-based solution;
- If the intervention does not provide biodiversity net benefits, it is not a NbS - See Figure 6

The headings in the table on page 12” as table is not numbered and is on page 10.

If you decide to proceed with the intervention it is then recommended to use the IUCN Global Standard, associated Guidance document and the Self-Assessment Tool as a guide. This will enable you to assess whether the intervention is a nature-based solution or not, and where you need to improve / strengthen key elements.

The IUCN Global [Standard](#), [Guidance document](#) and the [Self-Assessment Tool](#), enables users to:

- Design new nature-based solutions;
- Upscale pilots by identifying gaps, and
- Verify past projects and future proposals as “nature-based solutions”.

Note: This does not enable an assessment of whether the nature-based solution is effective and additional indicators are needed to assess contributions to addressing the societal challenge, human wellbeing and biodiversity.

It is recommended that you follow the IUCN Global Standard to design new or assess existing NbS interventions, and the information required for the Self-Assessment Tool can be obtained in a facilitated workshop with partners. This will contribute to developing a shared understanding of the interventions and building capacity on nature-based solutions through discussion on the criteria, indicators and guiding questions.

The Self-Assessment Tool is an excel sheet with drop down menus. When you have completed the tool, the result of the assessment is presented in the form of a % match, with 100% meaning the initiative is entirely compliant as a nature-based solution. There is a traffic light system to identify areas for further work (ie. with red meaning the initiative is not at all nature-based solutions compliant and much work to be done) and to report on adherence to the Global Standard for nature-based solutions. Figure 4 explains the eight criteria.

THE GLOBAL STANDARD

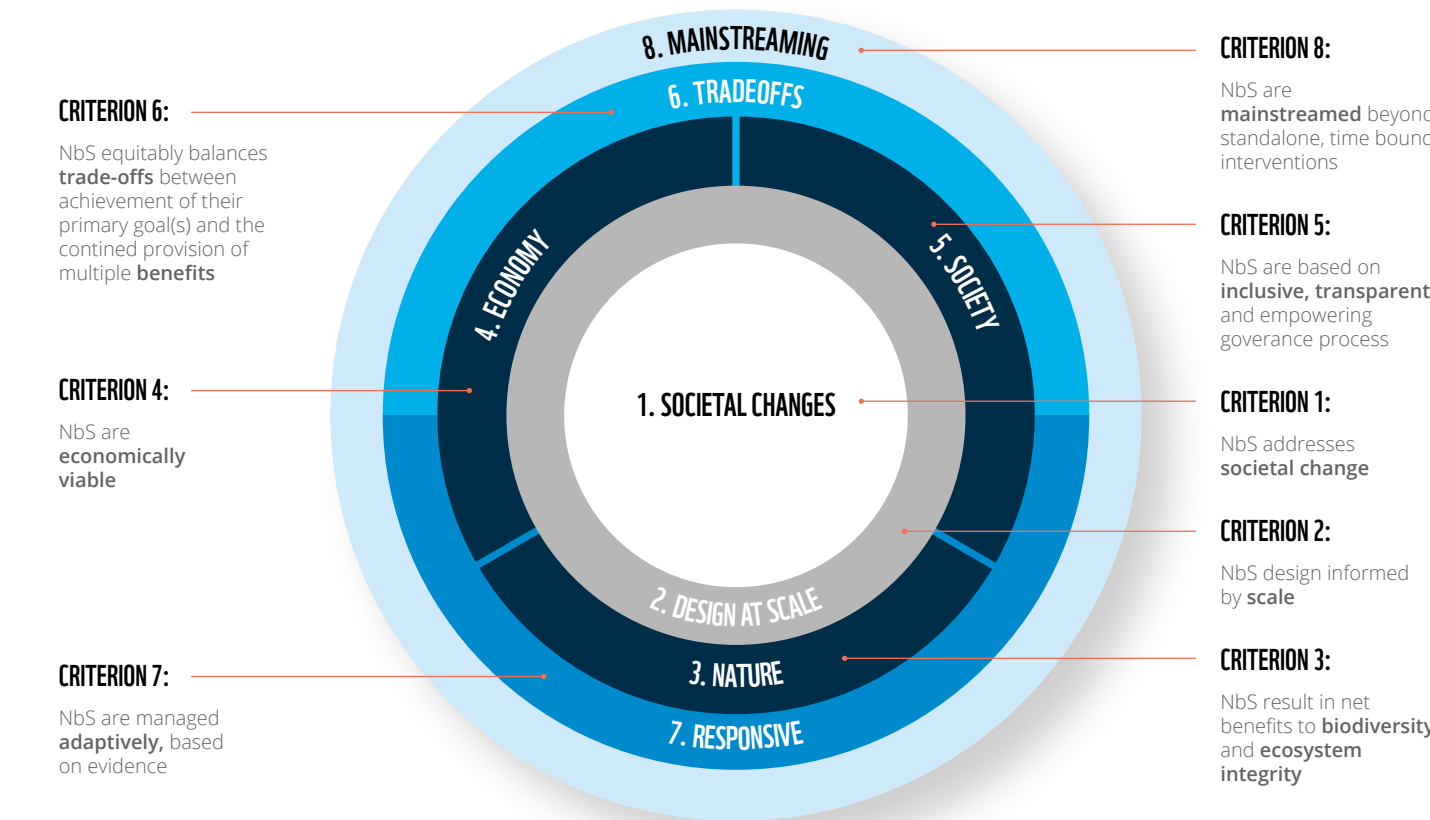


Figure 4
The 8 criteria for nature-based solutions, as per the IUCN Global Standard
Source: IUCN (2020)

The Self-Assessment tool is currently under user revision. The tool is useful not only for developing new nature-based solutions interventions, but also for reviewing existing interventions to identify whether it is indeed NbS. Bringing the project team together and applying the tool to the project is also a good way to build capacity and understanding of nature-based solutions, as well as strengthen the project.

The Self-Assessment Tool is an excel sheet which has tabs for each criteria and indicators for each. The tool provides guidance to assess how well the intervention addresses the indicators, as per Figure 5 below.

CRITERION 1: NbS EFFECTIVELY ADDRESS ONE OR MORE SOCIETAL CHALLENGES

Indicator No.	Indicator	Guiding questions	Use dropdown menu to input how well intervention matches to indicator	How well has the indicator been met			
				Strong	Adequate	Partial	Insufficient
1.1	The most pressing societal challenges for right holders and beneficiaries are prioritised.	Are societal challenges identified? Are rights holders and beneficiaries being consulted? Are the most pressing societal challenges for rights holders and beneficiaries prioritised?	Strong	Yes. The most pressing societal challenges prioritised based on full consultation with rights holders and beneficiaries.	Specific societal challenges identified with some consultation with rights holders and beneficiaries.	General societal challenges identified with limited from rights holders and beneficiaries only.	No. No clear societal challenges identified and/or no consultations with any rights holders and beneficiaries.
1.2	The societal challenges addressed are clearly understood and identified.	Are the drivers and responses to the societal changes identified? Are the societal challenges understood at the relevant national/ local context? Are the societal challenges documented and accessible to affected stakeholders.	Adequate	Yes. The drivers of and responses to identified societal challenges are well understood, including with reference to the relevant national/ local context, and are fully documented.	Drivers of and responses to identified societal challenges are broadly understood within the relevant context, although some documentation and knowledge gaps persist.	Societal challenges framed in terms consistent with widely accepted narratives but multiple documentation and context-specific knowledge gaps persist.	No. Superficial/ limited understanding of drivers of and responses to identifies societal challenges with limited or no documentation.
1.3	Human wellbeing outcomes arising from the NbS are identified, benchmarked and periodically assessed.	Are human wellbeing outcomes relevant to the identified societal challenges identified? Are there benchmarks in place to monitor impact? Are outcomes and benchmarks assessed at regular intervals? Are human wellbeing outcomes incorporated into the strategy for the intervention?	Adequate	Yes. SMART human wellbeing outcomes and benchmarks, relevant to the identified societal challenges and national/local context, are identified and are assessed at regular intervals.	Specific human wellbeing outcomes and benchmarks relevant to the identified societal challenges and national/local context, are identified and assessed at least once during the intervention period.	General human wellbeing outcomes and benchmarks identified but no provision has been made for their assessment.	No. Human wellbeing outcomes are not identified or vague and ill defined with no benchmarks and no provision for assessment.

Figure 5
Self-Assessment Tool
Source: IUCN (2020)

The results of the IUCN self-assessment tool will highlight if your intervention is a strong or weak NbS intervention, highlighting areas that need work to improve and strengthen it. It can also be used to monitor progress over time. The output of the interventions are evaluated in a traffic-light system where the weaknesses are highlighted in order to improve it - See Figure 6.

Key (%)	Output	
≥75	Strong	Intervention adheres to the ICUN Glabal Standards for NbS
≥50 and <75	Adequate	
≥25 and <50	Partial	
<25	Insufficient	Intervention does not adhere to the ICUN Glabal Standards for NbS

Figure 6
Output of the self-assessment tool
Source: IUCN (2020).

For more information on IUCN’s concept and the global standard, here are some useful links:
Nature-based solutions to address societal challenges ([Click here](#))
IUCN Global Standard for nature-based solutions: First Edition ([Click here](#))
IUCN Global Standard for nature-based solutions: Users Group ([Click here](#))

II. ATTENTION TO CROSS-CUTTING ISSUES

There are two critical cross-cutting elements that must be addressed when designing, developing and implementing nature-based solutions:

- **Inclusive:** Follow the WWF guidance on [inclusive conservation](#), the [Environmental and Social Safeguards](#) (ESSF) and the [WWF Social Policies](#), ensuring a participatory process and equitable outcomes.

Ensure that these principles and guidelines are integral to the development of all NbS interventions to ensure that WWF NbS programmes support local priorities and enable local stakeholders to identify and articulate their priorities, rather than impose ours (or donors’). WWF has co-authored a report on Community-led NbS that provides examples of how to develop equitable, community-led NbS.

Contact [Joost Van Montfort](#) for further information.

Climate Smart: identify the climate risks to people and nature at the outset and ensure that adaptation options to address these risks are co-designed by the affected people, and appropriate to their needs and contexts.

Climate change threatens the biodiversity and ecosystem services that are the foundations of nature-based solutions. Unless the climate risks to NbS are considered and addressed, the nature-based solution can fail or exacerbate climate vulnerabilities of nature and people, i.e. be maladaptive.

III. IDENTIFY SOCIETAL CHALLENGE

As mentioned above, nature-based solutions must resolve an identified problem and so are designed specifically to address clear societal challenges. A question asked often is “whose societal challenges”? WWF follows the IUCN guidance for nature-based solutions, so for us, the societal challenges are: **food security, climate change, water security, human health, disaster risk, social and economic development**, and last year, IUCN recently included ecosystem degradation and biodiversity loss. WWF adheres to the IUCN Global Standard on NbS that advises that this challenge cannot be addressed in isolation and at least one of the listed societal challenges must be addressed in the same intervention. Be as specific as possible about what will be addressed: so rather than “climate change”, specify if mitigation or adaptation; and in adaptation for example, adaptation to what impact. This will enable a suitable nature-based solutions to be identified to address the challenge.

It is critical that this challenge is identified by and with those who are to be the “beneficiaries” of the intervention. If the intervention is to be at a national level, critical societal challenges and development needs for a country are often articulated in national development policy documents and are an important starting point. Local stakeholders must always be integral to the identification of the societal challenge and any nature-based solution WWF implements must be aimed at achieving the needs and priorities of the local stakeholders - see landscape approach section. An in-depth contextual and needs analysis of the local stakeholders must be done prior to any intervention being developed. This is aligned to IUCN’s Global Standard Criteria 5.

By addressing one societal challenge, it is possible that your interventions address others as co-benefits and create other multiple synergies for people, nature and climate. The difficulty lies in properly measuring all the benefits provided by your intervention. Table 5 provides a list of potential indicators that may help measure the impact and effectiveness of your intervention

IV. IDENTIFY THE NATURE (ECOSYSTEM) TO BE USED AND HOW IT CAN BE SUSTAINABLY MANAGED

Once the societal challenge is clearly identified, the next step is to identify what ecosystem (“nature”) will be used in the NbS intervention to address the identified societal challenge. As a conservation organization, it is likely that we will want to start with this step - i.e. identifying what “nature” we want to work with - and it can be identified at the same time as the societal challenge. It is critical that the societal challenge is not seen as a “co-benefit” but the primary objectives of the initiative.

This can be done through review of the biodiversity, ecosystems and services in the landscape in which WWF is working, and identifying how it can be used to address the identified societal challenge.

For example, if flooding is a risk identified within the societal challenge of “climate change”, an evaluation of what nature-based methods can be employed to address flooding (eg. revegetating riverbanks) should be made. Societal challenges present in the landscape can be mapped against the ecosystems and potential nature-based activities that can address them. For example, here are some considerations but are not exclusively to that:

Ecological realm	Ecosystem / biodiversity	Activity	Climate Change	Disaster Risk Reduction	Food Security	Water Security	Human Health	Socio-economic Development
Terrestrial	Tropical rainforest	Forest restoration	x	x		x	x	x
	Tropical savannahs	Rangeland management	x		x			
	Mangroves	Mangrove restoration	x	x	x			
Freshwater	Watersheds	Watershed restoration	x	x	x	x	x	x
Marine	Corals reefs	Coral Reef restoration	x	x				x

Table 3.
Indicative examples of mapping biodiversity / ecosystems and their application to Societal Challenges. (NOTE: Nature-based solutions are context specific, as such the mapping below is only an example of possibilities of societal challenges that can be addressed with each NbS intervention. It is not meant to include all ecosystems WWF works on, or all NbS opportunities)

Unlike the above table which is only an example, be as specific as possible about the societal challenges (“flooding”) as possible and the activities that can address them.

Another critical consideration is that the nature in the “nature-based solutions” must be used and managed sustainably, and for us as WWF, it must improve biodiversity - More information in Table 6.

There is increasing focus on the “Blue Economy”. In some countries, this may be seen as purely an economic activity, with little emphasis on sustainability (ie. “Sustainable Blue Economy”), as such the improvement to biodiversity must be clearly articulated and demonstrated to be a nature-based solution.

V. LANDSCAPE-SCALE APPROACH

Criterion 2 of the global standards refers to the need to design NbS at scale.⁹ IUCN believes that **all interventions, including those that occur at single sites or small spatial scales, should be developed in the context of the large landscape/ seascape through landscape/seascape planning**, to avoid trade-offs and ensure that activities are strategic and maximize benefits to people and ecosystems, while minimizing adverse effects on adjacent ecosystems and human populations.

“A landscape is a socio-ecological system that consists of natural and/or human-modified ecosystems, and which is influenced by distinct ecological, historical, economic and socio-cultural processes and activities”. ([Little Sustainable Landscape Book, 2015](#))

Using the landscape-scale approach will enable providing different ecosystem services for provisioning and for regulation at different levels. For example, at a global level a restoration intervention can address carbon sequestration, while at regional level can regulate the watershed and at a local level can provide climate adaptation services.

Conservation here involves joining these areas of land together to maintain and improve ecological integrity for the benefit of wildlife and people. [WWF Landscapes](#) have been structured in two levels:

- A. Landscape (also referred as “umbrella” landscape).
- B. Operational Landscape

Umbrella landscapes are areas of global biological importance identified as a conservation priority for WWF that have a clear and well-defined strategic intent for conservation. They tend to be well defined systems falling within a WWF Priority Place, an ecoregion or a Key Biodiversity Area and respond to the Little Sustainable Landscape Book definition: “the Little Sustainable Landscape Book definition mentioned above”.

WWF Operational Landscapes are normally smaller and more homogeneous than “Umbrella” landscapes and are the units at which WWF executes the strategy, delivers conservation activities on the ground.

¹⁰ IUCN (2020). Orientación para usar el Estándar Global de la UICN para soluciones basadas en la naturaleza. Unmarco fácil de usar para la verificación, diseño y ampliación de las soluciones basadas en la naturaleza. Primera edición. Gland, Suiza: UICN

The Global Landscapes Forum defines the “[landscape approach](#)” as “balancing competing” land use demands in a way that is best for human well-being and the environment. It means creating solutions that consider food and livelihoods, finance, rights, restoration and progress towards climate and development goals. A landscape approach is a way of managing the landscape through long-term collaboration among multiple stakeholders, with the purpose of achieving sustainable landscapes.

It involves convening keystakeholders to build consensus about landscape management and decision making. A landscape approach is useful when there are diverse resource requirements, interactions and interdependencies in resource management, and a need for sustained commitments by stakeholders to meet sustainable landscape objectives. WWF’s Sustainable Landscape Initiative has further guidance on this approach.

The following considerations proposed below are a mix of considerations taken from the [WWF Bankable Nature Solutions Programme](#). WWF Netherlands aimed to help practitioners design and implement a successful landscape-scale NbS project. These are aligned to Criterion 2 of the IUCN Global Standard, the WWF Programme Management Standards, the NbS internal Training Sessions for Practitioners and the WWF Social Policies and Guidance on Inclusive Conservation:

1. Establishing a multi-stakeholder platform with all the stakeholders involved: Identify the interactions between society, economy and the environment within and outside the area of your project;
2. Understand the flow of ecosystem services in the ecosystems, including novel, latent and sustained services;
3. Building shared understanding: Design a common understanding and goals with the stakeholders involved including contingency measures to prevent potential risks and other trade-offs;
4. Collaborative planning and vision: Incorporate other complementary interventions occurring in the area of interest;
5. Effective implementation: Landscape level programs are designed for the long-term and therefore need to be secured from changes in government, donor, corporate or NGO policy to ensure sustainability; and
6. Learning and impact: Monitoring for adaptive management and accountability throughout the life cycle of the project.

In addition, in a given landscape, a nature-based solutions intervention could find synergies with other traditional and technological solutions. The essence of the landscape-scale approach is to put people together to work on a common solution. Landscape-scale NbS is not about upscaling or downscaling, it is about deep scaling, changing values and relationships.

VI. EFFECTIVELY MANAGE TRADE- OFFS

It is very important to recognize and identify potential trade-offs in nature-based solutions. Criteria 6 of the IUCN Global Standard refers to trade-offs and the importance of identifying them and negotiating equitable outcomes. However, often trade-offs are inadvertently or purposefully overlooked by practitioners. This can be for the following reasons:

- Trade-offs are often invisible to those making decisions;
- Trade-offs are not always explicit or obvious;
- They can be complex and all of their intertwined elements are not always evident; and
- Trade-offs can be differently perceived and experienced.

Galafassi, D., T. Daw, L. Munyi, K. Brown, C. Barnaud, and I. Fazey. 2017. Learning about social-ecological trade-offs. Ecology and Society, Vol. 22(1):2. <https://doi.org/10.5751/ES-08920-220102>

Key questions to ask to identify trade-offs are:

- Who benefits and who carries the costs of the interventions?
- How significant are the costs vs the benefits in the perceptions of those affected?
- What are the alternatives and what are their costs/benefits?

Some of the trade-offs identified so far have been grouped in four types:

TYPE OF TRADE-OFFS	DESCRIPTION	EXAMPLES
1 Biophysical	Biophysical constraints restrict the supply and demand of different ecological and human benefits, making trade-offs inevitable ¹⁰	- Choosing between biodiversity and societal challenges (loss of income and/or productivity, land competition with other activities, access right restrictions,etc.) - Prioritizing one ecosystem services (nature’s contribution to people) over the other¹¹: Material uses of nature (provisional ecosystem services) are more likely to lead to trade-offs rather than synergies, on the other hand non-material and regulating uses generate synergistic benefits
2 Governance	It takes into account the differing rights to resources and values of the stakeholders, including different sources of knowledge	- Western Science and local / indigenous knowledge - Difference between stakeholders with different values (i.e. cross and multi-sectoral differences) - Power relations between stakeholders - those with power over those without. Often the decision made is a matter of who has more power - Implementing top-down, exclusive (non-participatory) decision-making. - Restricting / criminalising access or use by rights-holders of natural resources, including land. - Using different decision support tools (CBA)
3 Scale	They take into consideration the space of trade-offs generated outside the intervention’s direct and indirect area of influence	- Global priorities (societal challenges) over local priorities (e.g. a carbon mitigation project is good for people on a global scale but may compromise people at a local scale by neglecting other practices): a forest carbon project may have great value for the global community in terms of reducing climate change emissions; however in the past such initiatives have come at the cost of local peoples’ access rights. WWF does not support initiatives that negatively affect resource users / owners, but where this may be possible, engage with the project affected people to identify equitable solutions. The duality between achieving the triple synergy (people, climate and nature) through NbS does not mean that other trade-offs won’t appear in other scales. - Environmental problems moves elsewhere (leakage in forest climate solutions)
4 Temporal	They take into consideration the timeframes of trade-offs generated outside the intervention’s direct and indirect area of influence	- Short-term vs long-term benefits (i.e. short-term jobs vs. permanent sustainable ones; longer time frames to achieve results) - Prioritizing current ecosystem services over future and unknown services: Current ecosystem services (Sustained services) are often chosen in a fast-forward climate scenario landscape neglecting services that are currently not used but could be value in the future (latent services) or emerging ones from new biophysical and social context (novel services)¹²
5 Cost and benefits	It involves the imbalance in allocation of costs and benefits	- More benefits for men than for women - Increasing vulnerability of a certain group - Economic benefits over cultural and non-economic values - Gentrification and forced displacement of marginalized communities - Uneven class benefits (higher class people

Source: Chapter 8. In Pérez-Cirera et al., 2021.

¹⁰ Lu, N., Liu, L. and Yu, D. and Fu, B. (2021). Navigating trade-offs in the social-ecological systems. Current Opinion in Environmental Sustainability, Vol. 48, pp. 77-84

¹¹ Cavender-Bares, J., S. Polasky, E. King, and P. Balvanera. 2015. A sustainability framework for assessing trade-offs in ecosystem services. Ecology and Society 20(1): 17.

¹² Lavorel, S., Locatelli, B., Colloff, M. and Bruley, E. (2020). Co-producing ecosystem services for adapting to climate change. Philosophical Transactions of the Royal Society B, Vol. 375, pp-



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Trade-offs are aspects of complex dynamics in interdependent social-ecological and economic systems.¹³ One of the most documented trade-offs associated with nature-based solutions (and related concepts) are the biophysical constraints (1 in the table above).^{14,15} The win-win scenario may not always be possible, for this reason. Explicitly considering trade-offs from the outset (‘trade-off thinking’) will help people to identify existing shortcomings, improve management approaches, and make the most feasible choice under limited conditions. The other three types of trade-offs are considered to potentially affect communities, greater society and the economy. Desirable outcomes should be acceptable and forward-looking by understanding and balancing the multiple trade-offs at a certain scale, and must be negotiated in a fair and transparent manner. Some principles taken into consideration to reduce and manage trade-offs are:

- Planning intervention at a landscape and seascape scale can reduce biophysical constraints.¹⁶ For more information on landscapes, see the section below;
- Ecosystem services associated with economical benefits are only one type of benefits that could determine other services. Always try to take into account other ecosystem services such as cultural ones in your intervention;
- Adaptive management is central to nature-based solutions: Choices made in the intervention at one particular time, doesn’t mean they cannot be negotiated at a later stage. Monitoring and evaluation of decisions and activities and managing adaptively is required throughout the interventions;
- Inclusive decision-making spaces where stakeholder interaction across multiple sectors and scales such as multi-stakeholder platforms are critical to cultivate collective equity, fair and just consensus building actions where top-down and bottom-up approaches are merged.^{17,18}
- Public participation is critical to ensure transparency, equality and joint ownership of NbS.^{19,20}
- Adhering to WWF’s Social Policies on Human Rights, Gender and Indigenous Peoples, and following our principles of social equality and, partnerships. These are also linked to the SDGs, specifically:
 - SDG5 - Gender equality: A robust NbS intervention should not promote any form of discrimination based on gender.
 - SDG8 - Decent work and economic growth: nature-based solutions must encourage entrepreneurship and job creation that guarantees fair income and safe working conditions.
 - SDG10 – Reduced inequalities: A robust NbS should recognize the social, economic and political inclusion and needs of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.
 - SDG16 – Peace, justice and strong institutions: Ideally NbS should develop effective, accountable and transparent institutions while ensuring responsive, inclusive, participatory and representative decision-making at all levels. These characteristics have to involve a distributional justice where accessibility, availability, and other aesthetic aspects of NbS are distributed among the community²¹.

VII. POTENTIAL COLLATERAL EFFECTS TO CONSIDER

Collateral effects consider all the potential negative consequences or ecosystem disservices that may arise from nature-based solutions and that can harm biodiversity, human rights, the economy or human health. Following the examples provided by nature-based solutions, it is vital to recognize that there may well be some potential negative consequences (collateral effects) during any of the stages of the project (prior implementation, during implementation or post implementation). Adhering to the IUCN Global Standard can assist to mitigate or avoid some of the collateral effects listed opposite:

Here are some considerations to be aware of
(please note this is not an exhaustive list):

Collateral effects affecting ecosystems structures:

- Bringing nature to cities or close to human settlements can invite all forms of biodiversity. While people may appreciate certain wildlife species such as birds, they may dislike others (e.g. snakes, spiders, large carnivores, rodents). It is vital to communicate the importance of all aspects of biodiversity and its wide contribution as a whole to human society.
- Increased human-wildlife conflict: This is relevant in rural areas and also urban areas.
- The lack of wildlife diversity in a landscape and the overabundance of specific species can disrupt the integrity of the entire ecosystem. People may be affected as a result - for example, through the exacerbation of allergic pollen reactions due to wind-pollinated plants.

Collateral effects affecting human rights:

NbS may undermine customary rights to, and use of, land and natural resources which may result in the following (not an exhaustive list):

- Ethnocentrism: judgement of other cultures / values according to another culture / values preconceptions (for example, eating of wild meat is traditional in many countries but abhorrent in others)
- Cultural appropriation: the unacknowledged or inappropriate adoption of elements of a marginalised culture by members of a dominant culture
- Loss of livelihoods: when use of resources that underpinned livelihoods is restricted through the implementation of the NbS
- Loss of customary natural resource management governance systems and traditional knowledge: if the NbS imposes a different one(eg. a “western” governance system and “modern science” imposed on traditional one and not integrating traditional knowledge in management)
- Criminalisation: when people’s traditional use of natural resources is made illegal and they have no other options to fulfil their livelihood, cultural or spiritual needs

¹³ Galafassi, D., T. Daw, L. Munyi, K. Brown, C. Barnaud, and I. Fazey. 2017. Learning about social-ecological trade-offs. Ecology and Society, Vol. 22(1):2. <https://doi.org/10.5751/ES-08920-220102>

¹⁴ Cavender-Bares, J., S. Polasky, E. King, and P. Balvanera. 2015. A sustainability framework for assessing trade-offs in ecosystem services. Ecology and Society 20(1): 17. <http://dx.doi.org/10.5751/ES-06917-200117>

¹⁵ Deng, X., Li, Z. and Gibson, J. A review on trade-off analysis of ecosystem services for sustainable land-use management. J. Geogr. Sci. 26,953–968 (2016). <https://doi.org/10.1007/s11442-016-1309-9>

¹⁶ García-Llorente, M., I. Iniesta-Arandia, B. A. Willaarts, P. A. Harrison, P. Berry, M. del Mar Bayo, A. J. Castro, C. Montes, and B. Martín-López. 2015. Biophysical and sociocultural factors underlying spatial trade-offs of ecosystem services in semiarid watersheds. Ecology and Society, Vol. 20(3):39. <http://dx.doi.org/10.5751/ES-07785-200339>

¹⁷ Bowen, K., Cradock-Henry, N., Koch, F., Petterson, J., Häyhä, T., Vogt, J. and Barbi, F. (2017). Implementing the “Sustainable Development Goals”: towards addressing three key governance challenges - collective action, trade-offs, and accountability. Current Opinion in Environmental Sustainability, Vol 26–27, pp 90-96

¹⁸ Martin, J., Scolobig, A., Linnerooth-Bayer, A. Liu, W. and Balsiger, J. (2021). Catalyzing Innovation: Governance Enablers of Nature-Based Solutions. Sustainability 2021, 13(4), 1971; <https://doi.org/10.3390/su13041971>

¹⁹ Rasmussen, L., Niels, F., Olesen, R. and Shackleton, S. (2021). Socio-economic outcomes of ecological infrastructure investments. Ecosystem Services, Elsevier, vol. 47(C).

²⁰ Wamsler, C., Wickenberg, H., Hanson, J., Olsson, A., Stalhammar, H., Björn, F., Gerell, D., Oskarsson, T., Simonsson, E., Torffvit, F., Zelmanlow, F. (2020). Environmental and climate policy integration: Targeted strategies for overcoming barriers to nature-based solutions and climate change adaptation. Journal of Cleaner Production, Vol 247

Collateral effects affecting economic activities:

- The need for subsidies or higher investment into the NbS intervention, especially at the early stages: It is possible that NbS approaches could have higher investment costs compared to technical works, even when NbS provides significant higher benefit and co-benefits²². Likewise, some sort of subsidies during the first years of the implementation may be required. For example, in the transition towards an agroecology farm in Cuba, the cost of implementation was higher during the first three years during which time support mechanisms from the government were needed²³.
- Regular monitoring and ongoing maintenance of the intervention: NbS actions might need more regular maintenance and monitoring than traditional approaches. For example, in afforestation and reforestation projects the maintenance of newly planted seedlings in the field is a crucial project component that affects the survival of the seedlings and the sustainability of reforestation initiatives. Primary causes of reforestation failure, other than inappropriate technologies, are the poor maintenance and protection of reforestation sites²⁴.
- Damage to the infrastructure (both urban and rural): Using nature can be unpredictable and may thus can damage hard infrastructure damages when there is a lack of technical maintenance or capacity. Lack of understanding, poor management of ecosystems or the use of the wrong species can increase costs of operations, also resulting in damage to infrastructure (“ecosystem disservice”). For example, tree roots damaging pavement and roads in the urban contexts.

Collateral effects affecting human health:

- Nature-related employment can entail high-risk jobs, including human-wildlife conflict: Working with nature may expose people to wildlife interactions or other nature-related risks. For instance, FAO considers forestry as a high-risk practice, game guards / rangers may come into high-risk wildlife situations, and there are several health and safety considerations that have to be considered when working in nature
- Increase insecurity and criminality: security within urban and peri-urban ecosystems is a well-documented issue for cities in the northern hemisphere, while in the southern hemisphere (eg. South Africa, Lima and Bogotá) these are perceived as areas with increasing criminality.
- Increase of water-borne vector diseases: Creation of wetlands have a direct positive impact in increasing mosquito populations. It is vital that wetland creation, expansion and management plans take into account the effects that wetland management might have on mosquito populations, nuisance-biting levels, and public and veterinary health. It is also necessary that such biodiversity initiatives have the knowledge and tools to enable them to assess and manage this impact as their work proceeds. It is crucial that environmentally-friendly mitigation strategies and wetland site locations are chosen with mosquito life histories in mind in order to minimise or avoid potentially deleterious effects²⁵.

VIII. ADHERING TO WWF PROGRAMME MANAGEMENT STANDARDS

WWF has robust [programme and project management standards](#) that should be followed in the design of all projects and programmes, including nature-based solutions. These include the 5 stages of programme implementation: Define; Design; Implement; Analyze and Adapt and Share.

An area of weakness identified in the Effort Mapping was the difficulty to show evidence of impact (both societal and biodiversity). As such it is critical that good indicators are developed against which progress can be measured, and critically, baselines must be established at the outset. See Section 4 for further guidance.

Nature is much less predictable and harder to measure than technical fixes, as such monitoring and evaluation are critical to sustainable nature-based solutions and to ensure that programmes are managed adaptively.

IX. ALIGNING TO EXISTING WWF (AND OTHER) PROGRAMMES, INCLUDING PRACTICE INITIATIVES, AND REGIONAL AND COUNTRY PROGRAMMES

As with all programmes and interventions that WWF designs, it is important to align with existing interventions underway and not to duplicate governance and institutional arrangement. NbS interventions will have the greatest impact at landscape, basin or seascape scale, so where possible integrate new interventions with other programmes, be they NbS or other programmes. Integrating interventions will also reduce competition for resources, avoid replication of activities / structures and thus wasting money; and also reduce unnecessary complexity for implementing offices who need to report differently on multiple programmes in the same areas / thematics.

When you are planning a NbS intervention (e.g.: if a donor approaches you with funding for “NbS”):

- Identify what (WWF landscape, Initiative) institutional structures are already in place, and how the new intervention can be integrated in that, rather than setting up new institutional structures;
- Identify what other similar WWF programmes, projects and Initiatives related to NbS already exist and where the new intervention could contribute / improve it;
- Identify what other WWF non-NbS interventions exist in that landscape and whether the new NbS intervention could support that programme / integrate with it.

The above should also be applied to non-WWF programmes, where our support could achieve greater impact by partnering with other organizations.

A number of Country Offices, Regional Offices, Landscapes and Practice Initiatives include nature-based solutions as a key component of their strategies. It is important that any new interventions support those priorities, rather than being developed as stand-alone interventions to simply suit a donor request for proposals. *Before embarking on the design of a new NbS intervention, contact the respective Practices and Regional Offices to understand what nature-based solutions interventions are already underway.*

²² Peng, L. and Jim, C. (2015) Economic evaluation of green-roof environmental benefits in the context of climate change: the case of Hong Kong. Urban For Urban Green, Vol. 14, pp. 554–561

²³ Lucantoni, D. (2020). Transition to agroecology for improved food security and better living conditions: case study from a family farm in Pinar del Río, Cuba. Agroecology and Sustainable Food Systems, Vol. 44, Issue 9, pp. 1124-1161.

²⁴ Le, H.D., More than just trees: Assessing reforestation success in tropical developing countries, Journal of Rural Studies (2011), doi:10.1016/j.jrurstud.2011.07.006

²⁵ Medlock, J.M., Vaux, A.G. Impacts of the creation, expansion and management of English wetlands on mosquito presence and abundance – developing strategies for future disease mitigation. Parasites Vectors 8, 142 (2015).



4. MEASURING EFFECTIVENESS OF THE NATURE-BASED SOLUTIONS INTERVENTION

I. IUCN GLOBAL STANDARD INDICATORS

As mentioned previously, IUCN has developed a Global Standard of NbS that builds a common language and understanding while ensuring quality of the interventions. It includes 28 indicators that can guide the design and monitoring of the WWF interventions, but do not include specific indicators to measure effectiveness.

II. SOCIETAL CHALLENGES INDICATORS (GLOBAL TO LOCAL)

Indicators to address societal challenges

It is critical that WWF nature-based solutions interventions have clear and measurable indicators for addressing the societal challenges. Table 3 shows a list of possible indicators that can be used to provide evidence to address the identified societal challenge. We must also identify how the NbS intervention can contribute to other national and international agendas such as the UN Agenda 2030 on the [Sustainable Development Goals](#), [the Paris Agreement](#), the [Zero Draft of the Global Biodiversity Framework](#), and the [Sendai Disaster-Risk Reduction framework](#). The following field-based indicators also aim to show how your results can contribute to these agendas.

Additionally to the SDG columns, as described above there are some other SDGs that are innate in NbS (SDG5, SDG10, SDG16 and SDG17) - See Trade-offs section.

Other SDGs are conditional on the geographical location of the project: The following SDGs (SDG11- Sustainable cities and communities, SDG14- Life below land, and SDG15- Life on land) could be addressed by an NbS intervention depending on the geographical location (Go to Annex 2 for more information).

Lastly, there are some NbS that do not directly address a SDG but could perfectly complement them:

- SDG4 (Quality Education): NbS according to IUCN's definition cannot be inspired by nature but educational programs certainly are required as enabling conditions for the promotion of nature-based solutions;
- SDG7 (Clean energy): Renewable energy projects are not nature-based solutions. IUCN defines these spectrum of projects as derived from nature. Nevertheless, some NbS interventions are considered to reduce energy consumption such as urban forests in cities;
- and SDG12 (Responsible Consumption): Even though they are certain nature-based solutions that rely on a responsible use of the natural resources (co-management of fisheries, community-based forestry), this SDG centers more on the notion of supply and demand market chains and targets to achieve a circular economy. Circular economy is a concept aside from NbS but their combined use could enable transformative change.

Societal Challenge	Field-based indicator	Reference	Support towards SDG goals ²⁸	Support towards other international frameworks
Climate change mitigation	Area of terrestrial or marine land under improved and effective management that contributes to green-house emission reductions. Please provide the answer in hectares (ha)	GCF, GEF and WWF	SDG13 (13.2), SDG14 (14.2 and 14.5) and SDG15 (15.1, 15.2, 15.3, 15.4, 15.5)	PA - Article 5 GBF - Target 2
	Carbon reduced or avoided by restoration, management and/or conservation. Please provide the answer in tones of carbon per hectare per year - baseline year	GCF, GEF	SDG13 (13.2), SDG14 (14.5), SDG15 (15.1, 15.3 and 15.4)	PA- Article 5
Climate change adaptation and disaster risk reduction	Number of people and/or communities whose vulnerability is reduced. Please provide the answer in number of people (men and women).	GCF and WWF	SDG1 (1.5), SDG2 (2.4), SDG5 (5.5 and 5.b), SDG8 (8.3, 8.5 and 8.9), SDG9 (9.3 and 9.4), SDG13 (13.1), SDG14 (14.b)	SF - Target B, Target G and Priority 3 and 4 PA - Article 7 and 8
	Extent of areas that reduce the vulnerability of people and local communities. Please provide the answer in ha	WWF	SDG2 (2.4), SDG3 (3.d), SDG11 (11.5)	SF - Target D PA - Article 7
	Reduction of climate and non-climate disaster risks and impacts (e.g. flood peak and drought; coastal flood and erosion - wave heights and speed; less frequency of events; runoffs; sediment loss; fires incidence) to people and/ or infrastructure via different methods such as sustainable drainage systems; protection and restoration of floodplains, wetlands including saltmarshes, mangroves, corals; tree restoration in slopes	Kumar et al (2021), FAO and WWF	SDG1 (1.5), 3 (3.d), SDG11 (11.b)	SF - Target D and priority 3 PA - Article 7 and Article 8
Food security	Type(s) of sustainable food production that is implemented to address food security.	GEF and WWF	SDG2 (2.4), SDG9 (9.4), SDG14 (14.7), SDG15 (15.2)	GBF - Target 4 and 8
	Number of people that have increased food security. Please provide which metric did you use to measure this indicator	FAO and WWF	SDG2 (2.1 and 2.2), SDG5 (5.a)	SF - Priority 3 PA - Article 2, 4 and Article 7 GBF - Target 8
	Have you seen a change in productivity or yields per area per season? Please provide the answer with a brief description of the methods used to record this.	FAO, CI and WWF	SDG2 (2.3), SDG8 (8.1 and 8.3)	GBF - Target 9
	Are you seeing an increase in the quality of nutritious diets? Please provide the answer with a brief description of the methods used to record this.	FAO	SDG2 (2.2) GBF - Target 9	GBF - Target 9
	Which adopted food security-related practices are addressing food security? For example, agroforestry, etc.	WWF	SDG1 (1.5), SDG2 (2.2), SDG5 (5.a), SDG8 (8.2), SDG14 (14.b)	SF - Target B and priority 3 PA - Article 2 and Article 7 GBF - Target 8
Water security	Water supplied or available from water bodies -including groundwater, aquifers, and baseflow restoration. Please provide the answer in m3	Kumar et al (2021), CI and WWF	SDG6 (6.3, 6.4 and 6.6), SDG15 (15.1)	GBF - Target 2
	Pollution (nutrients) filtered - including water quality improvement and soil moisture regulation. Please provide the answer in m3	Kumar et al (2021), and WWF	SDG6 (6.3), SDG14 (14.1), SDG15 (15.8)	GBF -Target 5 and Target 6
	Invasive alien species retained. Please provide which metric you used to measure this indicator.	WWF	SDG6 (6.6) SDG15 (15.1) GBF - Target 2	GBF - Target 2
Human health	Net air and/or water quality increased: Please for air provide the answer in PM2.5 or PM10; and for water in temperature, acidity (pH), dissolved solids (specific conductance), particulate matter (turbidity), dissolved oxygen, hardness and suspended sediment.	CI and FAO	SDG3 (3.9), SDG6 (6.3), SDG14 (14.1)	GBF - Target 11
	Increased green areas. Please provide the indicator in m2 of green area per person.	Kumar et al (2021), CI and FAO	SDG1 (1.5), SDG3 (3.d), SDG11 (11.b), SDG13 (13.1)	PA - Article 7
	Morbidity/fatalities reduced and/or health-related diseases reduced due to human-nature interactions - including wildlife encounters, hazardous jobs, etc. Please provide the answer in number of people (males and females)	FAO, Kumar et al (2021), GCF, Ci and WWF	SDG3 (3.9), SDG8 (8.6), SDG11 (11.5 and 11.6) SDG12, SDG15	GBF - Target 3
	Access to safe, inclusive and accessible green and blue public spaces. Please provide the answer in number of people (men and women)	Ci and WWF	SDG3 (3.9), SDG5, SDG11 (11.7)	GBF - Target 11
	Psychological and physical well-being increased. Please provide the answer in number of people (men and women)	FAO	SDG3 (3.9) GBF - Target 11	GBF - Target 11

Table 5.
Indicators to address societal challenges

PA: Paris Agreement ([link](#))
SF: Sendai Disaster Reduction Framework ([link](#)) and global targets ([link](#))
GBF: Post 2020 Global Biodiversity Framework - Zero Draft Updated ([link](#))
Source: FAO ([link](#)); GCF ([link](#)); GEF ([link](#)); CI - Conservation International ([link](#)); IBD; and WWF Effort Mapping; WWF and ILO ([link](#)); Dinerstein et al²⁷; Kumar et al.²⁸
²⁶ Full list of SDGs indicators ([link](#))

III. SOCIAL WELLBEING INDICATORS (LOCAL LEVEL)

This is linked to the “Societal Challenges” indicators, however it is important to recognize that often an intervention that contributes globally to a societal challenge such as climate change, can also have negative impacts at the local level. As such, WWF should pay particular attention to ensuring that the interventions benefit the people at the local level too. (See also the section on Trade-offs.)

Wellbeing is at its most simplest, about the aspirations and ability of people to “live well” and how individuals experience their situation. It goes beyond only income and even employment, and includes factors such as equity (social, political, environmental and economic), health, access to resources, housing, sustainable livelihoods, food security, education, empowerment (rights, voice, decision-making), political influence, social capital, personal security, cultural respect, spiritual freedom, resilience to external shocks (economic, political or environmental) and environmental quality.

However, wellbeing is as much subjective (how an individual perceives their wellbeing) and objective (how it can be quantified). Wellbeing indicators are often specific to the context in which the nature-based solutions are being developed and implemented, and as such must be identified in discussion with the community at whom the NbS is targeted at the local level. Improving wellbeing is also very much linked to the SDGs.



IV. BIODIVERSITY INDICATORS

Indicator	Reference	Target SDGs	Support towards international frameworks
Calculations on the protection of species, ecosystems and genetics diversity (Shannon-Wiener diversity index; alpha, beta and gamma diversity), including keystone or flagship species.	CI, SEP and Dinerstein et al 2020	SDG14 (14.5, 14.a and 14.c) SDG15 (15.1, 15.4, 15.5, 15.6 and 15.9)	GBF - Target 1
Number of biological corridors to enhance connectivity between landscapes and assist species movement	CI and Dinerstein et al 2020	SDG15 (15.1, 15.4, 15.5, 15.6 and 15.9)	GBF - Target 2 and Target 3
Quantity of habitat for species (nursery for marine species, macrorefugia) protected	Dinerstein et al., 2020; Pascual et al	SDG14 (14.5, 14.a and 14.c) SDG15 (15.1, 15.4, 15.5, 15.6 and 15.9)	GBF - Target 2 and Target 3
Number of enhance ecosystems resilient to climate change and other threats (pest egulation, pollination, water and air regulation, soil formation, ocean acidification)	CI; Dinerstein et al., 2020; Pascual et al	SDG14 (14.1, 14.2, 14.3, 14.4, 14.6, 14.a and 14.c) SDG15 (15.2, 15.3, 15.8 and 15.9)	PA - Article 5 and Article 7 GBF - Target 5, Target 6, Target 7 and Target 10

Table 6.
Biodiversity indicators

CI: Conservation International
Dinerstein, E., Joshi, C. Vynne, A. T. L. Lee, F. Pharand-Deschênes, M. França, S. Fernando, T. Birch, K. Burkart, G. P. Asner, D. Olson. (2020). A “Global Safety Net” to reverse biodiversity loss and stabilize Earth’s climate. Science Advances, Vol. 6, no. 36, eabb2824 DOI: 10.1126/sciadv.abb2824
Source: Own contribution

²⁷ Dinerstein, E., Joshi, C. Vynne, A. T. L. Lee, F. Pharand-Deschênes, M. França, S. Fernando, T. Birch, K. Burkart, G. P. Asner, D. Olson. (2020). A “Global Safety Net” to reverse biodiversity loss and stabilize Earth’s climate. Science Advances, Vol. 6, no. 36, eabb2824 DOI: 10.1126/sciadv.abb2824
²⁸ Kumar, P., Debele, S., Sahani, J., Rawat, N., Marti-Cardona, B., Alfieri, S., Basu, B., Sarkar, A., Bowyer, P., Charizopoulos, N., Jaakko, J., Loupis, M., Menenti, M., Mickovski, S., Pfeiffer, J., Pilla, F., Pröll, J., Pulvirenti, B., Rutzinger, M., Sannigrah, S., Spyrou, C., Toumenvirta, H., Vojinovic, Z and Zieher, T. (2021). An overview of monitoring methods for assessing the performance of nature-based solutions against natural hazards, Earth-Science Reviews, 103603, ISSN 0012-8252, <https://doi.org/10.1016/j.earscirev.2021.103603>

V. ECONOMIC INDICATORS

Economic indicators could include:

- Contributions to national economy;
- Employment created (national and local level);
- Income;
- New business opportunities;
- Reduced spend on disaster relief;
- Reduced spend on infrastructure (replacement new).

5. ENABLING CONDITIONS AND OVERCOMING SYSTEMIC BARRIERS TO NATURE-BASED SOLUTIONS

Below is a summary of key enablers / barriers to consider when developing nature-based solutions.

I. POLICY (NATIONAL / LOCAL POLICIES WHICH ENABLE NATURE-BASED SOLUTIONS LOCALLY)

1. When designing a nature-based solutions intervention, identify relevant policies and plans (including identification e.g.: relevant regulations, taxes, subsidies, tenure policies etc. identify relevant policies and plans (including identification e.g.: relevant regulations, taxes, subsidies, tenure policies etc.) which can support or hinder the intervention) which can support or hinder the intervention, looking beyond only the “conservation” aligned ones, for example national development plans, SDG workplans, climate change, agriculture, etc.
2. One of the activities in your NbS programme could also include influencing relevant policies in-country to provide a legal foundation for future NbS, such as development, climate change, agriculture policies.

II. FUNDING

1. Funding is needed to sustain NbS (as any other project). Decision-makers (public or private) charged with resolving a societal challenge will want to see cost-effectiveness analysis to make funding decisions. This analysis should also help identify different sources of funding, from the design to ongoing functioning of the nature-based solutions. Those can be philanthropic capital, public funding, private financial flows, etc;
2. Economic actors are often looking for the “business case” to invest in NbS vs other types of activities, such as ecological vs hard infrastructure. Externalities and co-benefits should also be included in this analysis, in order to better influence their investments;
3. Some companies are also seeking to offset their damaging activities by investing in environmental or social projects (“offsets”) or as part of their environmental, social, and governance (ESG) programme. Nature-based solutions can provide both societal as well ecosystem benefits and are thus good opportunities for this. Is important that NbS do not become tools to give companies a “pass” to reduce their negative environmental impacts. For more information, refer to the Guidance of Nature-based Solutions for Climate Mitigation.

III. CAPACITY BUILDING

As NbS is a “new” concept, it is likely that WWF will need to support partners in understanding what nature-based solutions are, and how NbS can support communities to improve their wellbeing and countries to achieve their development or climate objectives, while enabling sustainable biodiversity use. The NbS Steering Committee organized in July 2021, a three-day internal NbS Training Sessions for practitioners which is available for all the network. These training sessions aim to build a solid understanding and capacities around the elements that constitute high quality NbS interventions. For more information click [here](#).

Additionally, WWF offices have developed more detailed reports on enablers and barriers to NbS which you can refer to for further information:

Powering Nature: Creating the conditions to enable nature-based solutions.

To read the report, [click here](#)

Systemic NbS Report, WWF-UK report.

For more information, contact [Clement Metivier](#)

Overcoming the barriers of NbS, WWF Global Science Team.

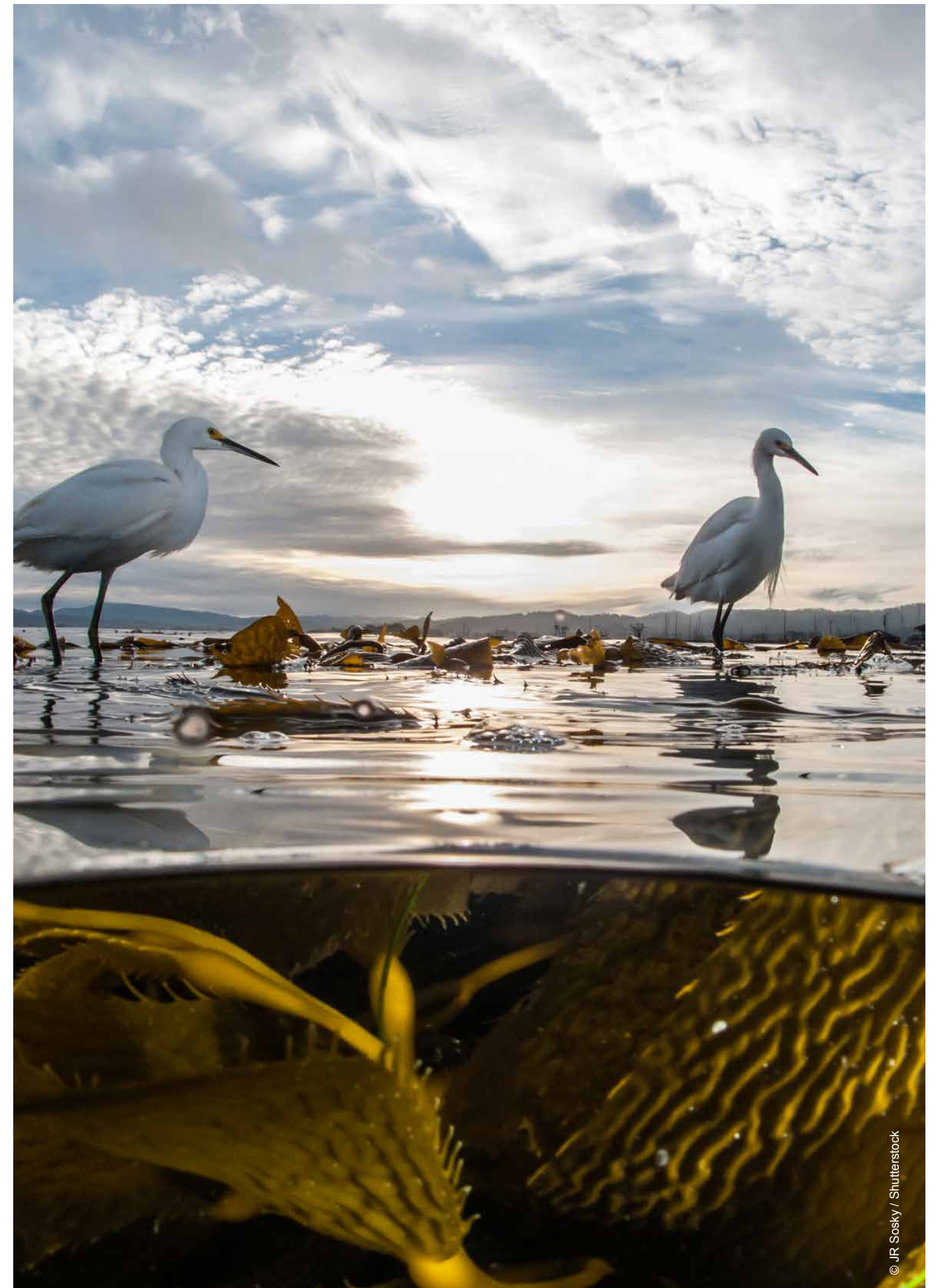
For more information, contact [Jeff Opperman](#)



SECTION III: TAKEAWAY MESSAGES

REFLECTIONS

- NbS is still an evolving concept and some knowledge gaps are still reported. The evolution of the concept to respond to the current needs provide opportunities to expand our work. New ways to implement NbS and breakthrough insights are expected.
- The design and implementation of NbS have traditionally focused on specific projects in specific places. This spotlight on “project level” interventions is welcome to demonstrate what successful, sustainable NbS look like. However, these efforts alone will not be enough to effectively deliver benefits for climate, biodiversity, and people over the long term. In fact, stand-alone investments in many different NbS projects can become inefficient if the pressures of unsustainable production and consumption are not addressed. In order to maximize nature’s potential to respond to the interrelated crises of climate change and biodiversity loss, it is critical to eliminate a series of systemic barriers (such as unsustainable supply chains, harmful agricultural subsidies and a lack of finance) while at the same time unlocking a series of systemic enablers. High-impact, landscape-scale NbS will be effective only if actions are taken simultaneously within those systems, alongside efforts to protect and restore natural habitats.
- All NbS interventions in which WWF is involved must adhere to the principles of inclusive conservation, our Social Policies, as well as the WWF ESSF. It is critical that any NbS we design and implement is done so in collaboration with the people who will be affected by it, especially at the local level. The potential impacts on indigenous and local communities must be identified at the outset of the initiative, and equitable solutions must be agreed with the affected people’s participation.
- Be aware of the likelihood of trade-offs and the importance of identifying these at the outset of the project, but also ongoing throughout its lifespan, ensuring the affected stakeholders are engaged in discussions on these, and that an equitable solution is negotiated. Trade-offs need to be identified at different stages of the project, at the outset and also throughout the process, and continually monitored. Discussions and negotiations on these must take into account the views of all stakeholders involved including IPLC, women, youth and other marginalized communities.
- There are differing interpretations, eg. between the EU and IUCN. Be aware of these when developing your proposals and interventions, and remember that WWF adheres to the IUCN definition.
- NbS is often one element of a strategy, intertwined with policy + non NbS activities
- Not all of our conservation work is or will be NbS, and that is fine, as we do not have to repackage all of our work as NbS, but all NbS is conservation in that it must sustainably manage and improve biodiversity .
- It is very important that we do not try and label all of our work as NbS, as this only undermines the concept and the case to support these.
- We must manage the “nature” in NbS for change: climate, natural systems, human induced and over space, scales and time
- Always have a long-term perspective - even if the funding is short-term
- NbS, even those aimed at addressing climate change, are also vulnerable to climate impacts and risks. As such we must ensure that the climate risks to the NbS are identified and addressed
- Cost-effectiveness analysis will help decision makers “choose” NbS over other solutions to the same societal challenge
- Lastly - this document does not have all the answers, but hopefully points practitioners in the right direction to find the needed resources that enable us to start designing and implementing NbS.



8. ANNEXES

ANNEX 1: NbS GOVERNANCE AND STRUCTURE AND THE SDGs

The framework of NbS is directly linked to the Sustainable Development Goals (SDGs). The protection of nature (biosphere) is the baseline to fulfill all the SDGs (See Figure 3).

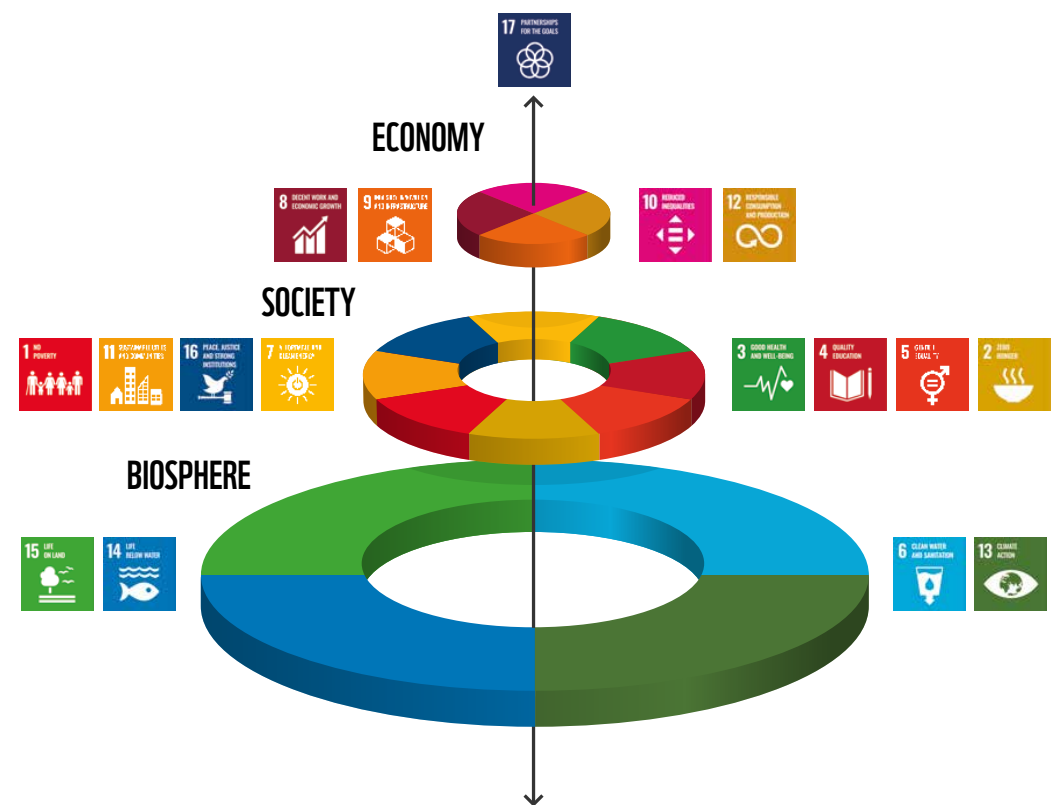


Figure 3
Contributions to Agenda 2030
Source: Stockholm Resilience Center, 2020. ([Link](#))

The Global Standard dedicates Criteria 5, 6, 7, and 8 to explain the desirable attributes in the form of successful NbS interventions. In this aspect, there are four SDGs that are considered innate when following the principles of the Global Standard.

- **SDG5 - Gender equality:** NbS should not promote any form of discrimination based on gender
- **SDG10 - Reduced inequalities:** Criterion 5 mentions that NbS should allow for the active participation of all people who may be directly or indirectly affected from the start to end of the intervention. And in the case that stakeholders are subject to inequality, inequity and marginalisation, in terms of their power, social position, culture or financial status, the underlying causes should be understood and all efforts made to reduce or avoid such inequities as much as possible (IUCN, 2020). A robust NbS should give spaces to indigenous communities, women, youth actors, and other marginalized groups.

- **SDG16 - Peace, justice and strong institutions:** Ideally NbS should provide these types of justices (Toxopeus et al., 2021):
 - **Distributional justice:** Involves questions of how access to (green, nature-based) amenities is distributed in society (assessing availability, accessibility, attractiveness and other aspects), but also how the costs and benefits accruing from those amenities are distributed among the population.
 - **Procedural justice:** Concerns the level and form of civil participation in decision-making around urban nature interventions. Interrogating procedural justice in NbS involves asking questions about the extent to which the planning, design, implementation and evaluation of urban NbS projects is open to input by citizens, who is represented (or not) in these participatory processes, and how much do these processes in fact influence decision-making
 - **Recognition justice:** Refers to the recognition of different needs, values, and preferences that depend on people's (intersectional) identities and characteristics, such as gender, race, age, ethnicity
- **SDG17 - Partnership for goals:** The global standard calls for NbS to have a landscape-scale in terms of identifying the interactions between society, economy and the environment within and outside the area of your project and design a common understanding and goals with the stakeholders involved and if possible to incorporate your NbS with other intervention (Criterion 2).

A High-Quality NbS should incorporate these SDGs if planned according to the Global Standard of IUCN.

NbS

Address one or more societal challenge	Provide biodiversity net benefits (Criterion 3)	Provide these benefits for society and institutions
Climate change and/or	13 CLIMATE ACTION	Against any form of discrimination on the basis of gender, recognise the participation and involvement of all actors regardless of age, religion, race, ethnic origin or economic status
Food security and/or	2 ZERO HUNGER	Develop transparent, effective, accountable, inclusive and participatory decision making at all levels Criteria 5 and 6
Water security and/or	6 CLEAN WATER AND SANITATION	Seeking synergies with other interventions or partnerships with other organisations Criteria 2 and 8
Disaster-risk reduction and/or	11 SUSTAINABLE CITIES AND COMMUNITIES	
Nature and Economic benefit y/o	1 NO POVERTY 8 DECENT WORK AND ECONOMIC GROWTH	
Human Health	3 GOOD HEALTH AND WELL-BEING	

ANNEX 2: FROM THEORY TO PRACTICE

NbS present a valuable opportunity for WWF to emphasize and to showcase nature’s value and potential for human development. They are also opportunities to assist us with social, climate and nature benefits synergistically.

WWF is working to enable and facilitate sustainable development in our landscapes, and NbS can be a key approach to do so - working to achieve human development, but in a way that ensures a healthy environment. It is important that we demonstrate that NbS are a powerful tool for social and human development, rather than primarily a nature conservation intervention and that development and nature conservation need not be seen in competition. Nature can provide society with cost-effective and resilient alternatives to grey infrastructure, or as complementary to it. NbS are also a means to connect urban ecosystems with peri-urban and rural ecosystems in landscapes, creating biological corridors that will enhance overall biodiversity.

Covid 19 has shown us the perils of unsustainably exploiting nature. NbS provide a practical pathway for a “fairer, greener, smarter” post Covid19 recovery (WWF and ILO, 2020), and can also assist us to avoid future pandemics

Importantly, NbS can support Indigenous Peoples and Local Communities (ICCA) by ensuring that their priorities are addressed and by enabling them to lead on NbS development and implementation.

ENDNOTES

1 IUCN (2021). *Nature-based solutions for people and planet*. Available at: <https://www.iucn.org/theme/nature-based-solutions>

2 Nature4Climate (2020). *NbS Briefing Room*. Available at: <https://nature4climate.org/NbS-briefing-room/>

3 Galafassi, D., T. Daw, L. Munyi, K. Brown, C. Barnaud, and I. Fazey. 2017. *Learning about social-ecological trade-offs*. *Ecology and Society*, Vol. 22(1):2. <https://doi.org/10.5751/ES-08920-220102>





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