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Nature-based Solutions

Katie Dawkins
(Programme Officer, Nature-based Solutions, UNEP-WCMC)

Bálint Ternyik
(Programme Officer, Nature Economy, UNEP-WCMC)

Repsol

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OVERVIEW

- Understanding Nature-based Solutions (NbS)
- Natural Climate Solutions vs NbS for Climate Mitigation
- Potential benefits of different interventions
- Risks and opportunities for NbS
- Planning NbS
- Case studies

MENTI-QUIZ

Go to www.menti.com and use the code 1459 0170

Understanding Nature-based Solutions

Katie Dawkins – Programme Officer – Nature-based Solutions – UNEP-WCMC

WHAT ARE NATURE-BASED SOLUTIONS?

"actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits" – UNEA-5, 2022

WHAT ARE NbS?

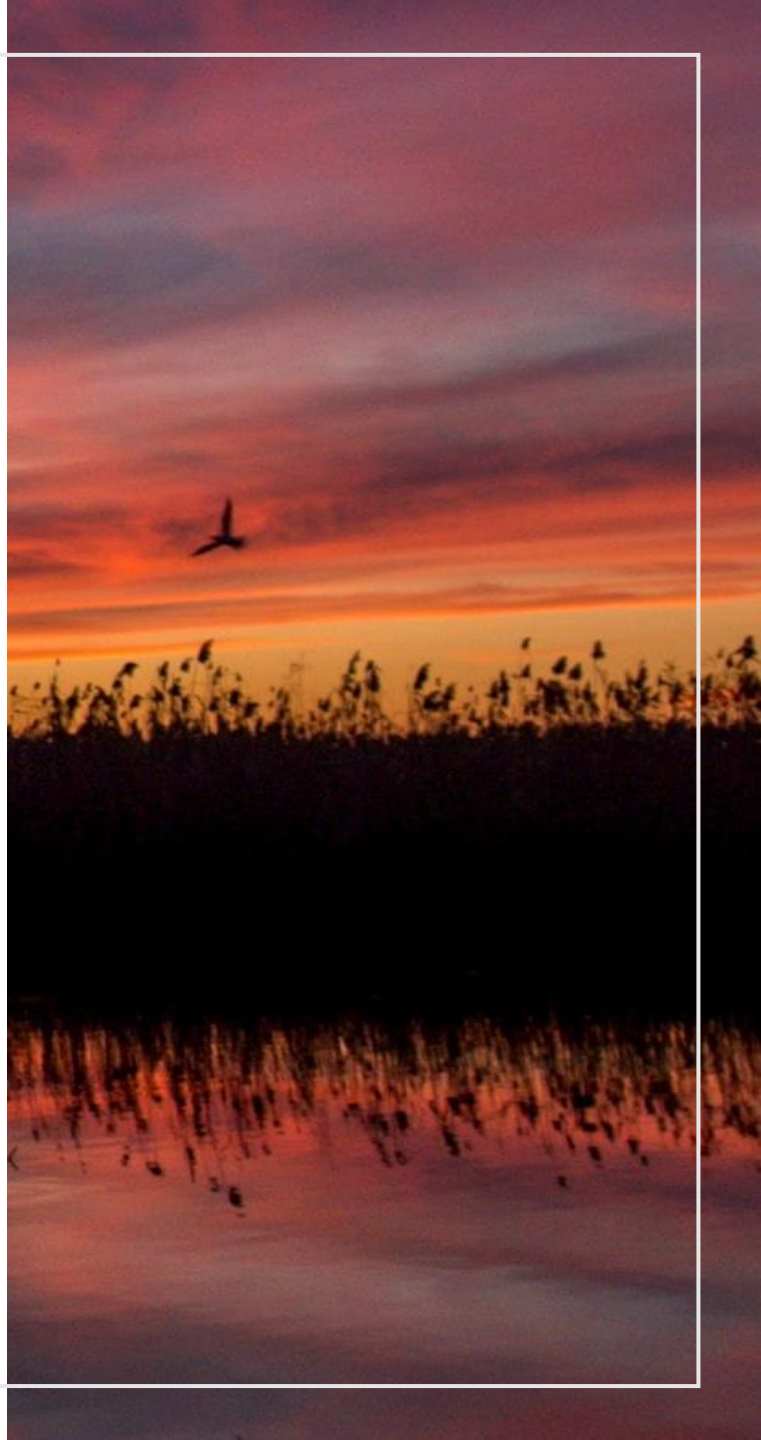
The UNEA resolution (UNEA-5, 2022) recognizes that NbS:

A- respect social and environmental safeguards

B- can be implemented in accordance with local, national and regional circumstances

C- are among the actions that play an essential role in the overall global effort to achieve the Sustainable Development Goals and address challenges

D- can help stimulate sustainable innovation and scientific research



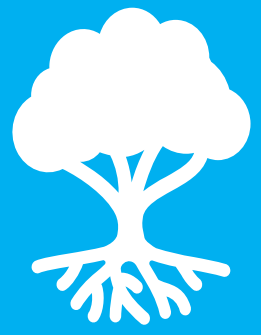
TYPES OF ACTION THAT CAN PROVIDE NbS

Different types of action can provide NbS:

- Ecosystem-based adaptation
- Ecosystem-based mitigation
- Natural climate solutions
- Green infrastructure
- Ecological engineering

Global Change Biology, First published: 01 February 2021, DOI: (10.1111/gcb.15513)

WHY NATURE-BASED SOLUTIONS?



Climate Commitments

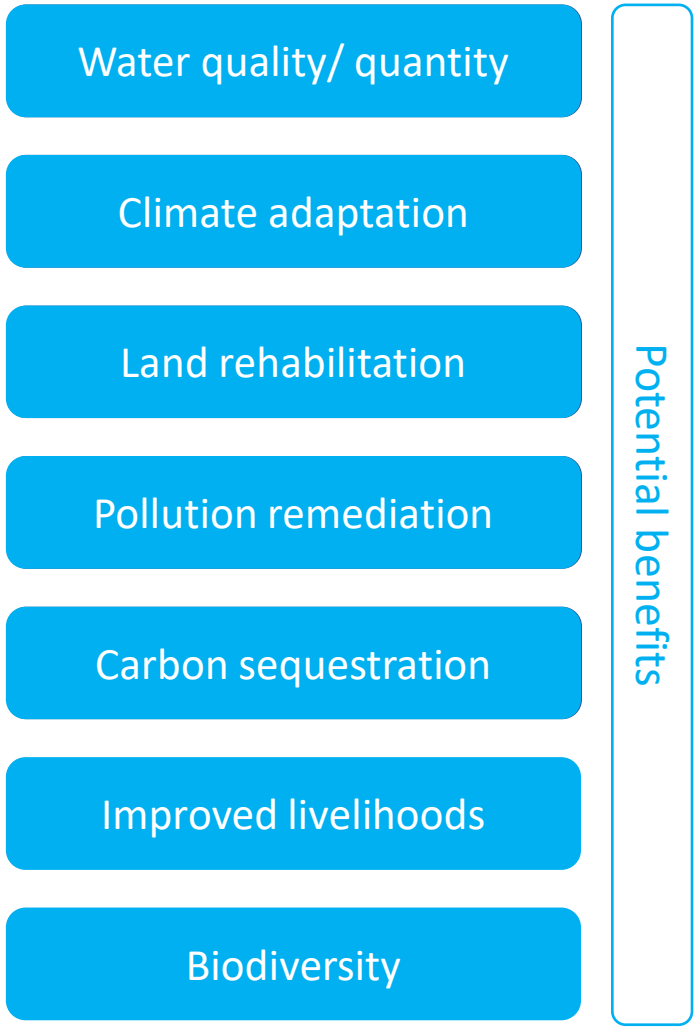
Biodiversity Commitments

Dependencies on Nature

Social Equity

BENEFITS ASSOCIATED WITH NbS

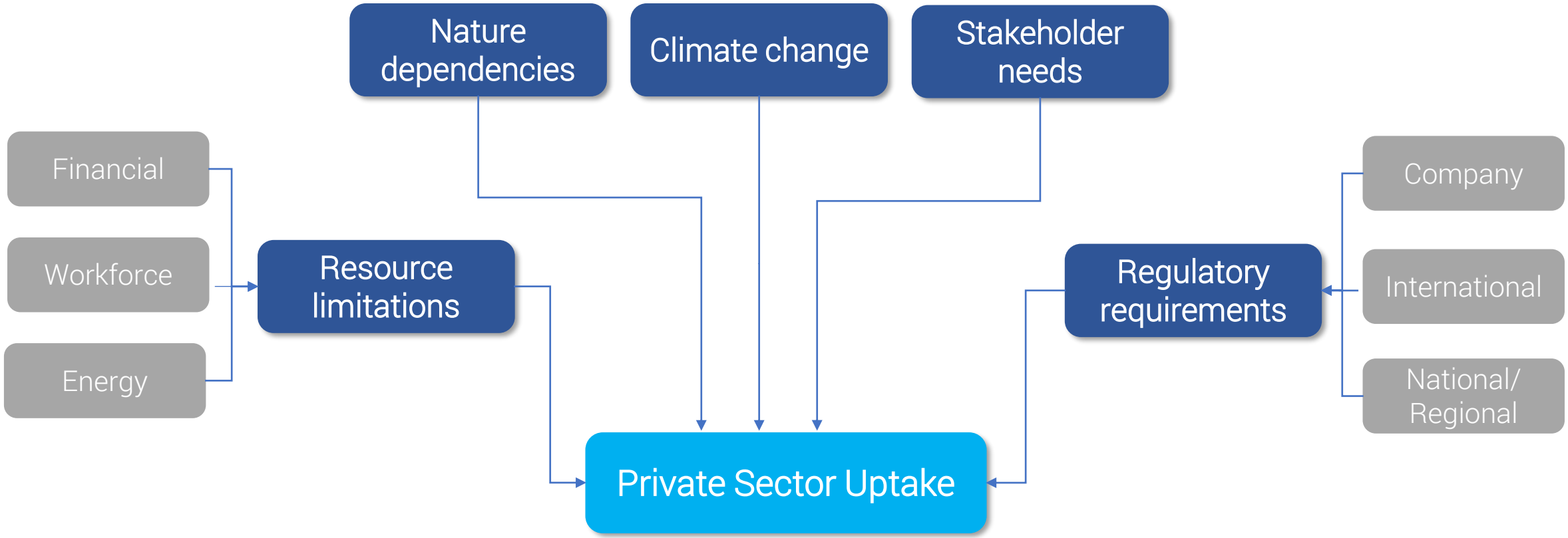
- NbS can provide substantial environmental and social benefits by maintaining and enhancing ecosystem services
- Benefits exist at multiple scales
- Understanding and assessing the value of benefits can be challenging
- But taking account of these benefits can dramatically improve the calculated cost-effectiveness of NbS



NbS WILL BE FUNDAMENTAL TO ACHIEVING GLOBAL GOALS

- Implementation of NbS at scale will be important to achieve global goals such as:
  - The Paris Agreement on climate change
  - The Kunming-Montreal Global Biodiversity Framework
  - The Sustainable Development Goals
  - Nature-positive
- NbS can support climate change mitigation and adaptation efforts, while preserving a wide range of ecosystems.
- Require robust safeguards

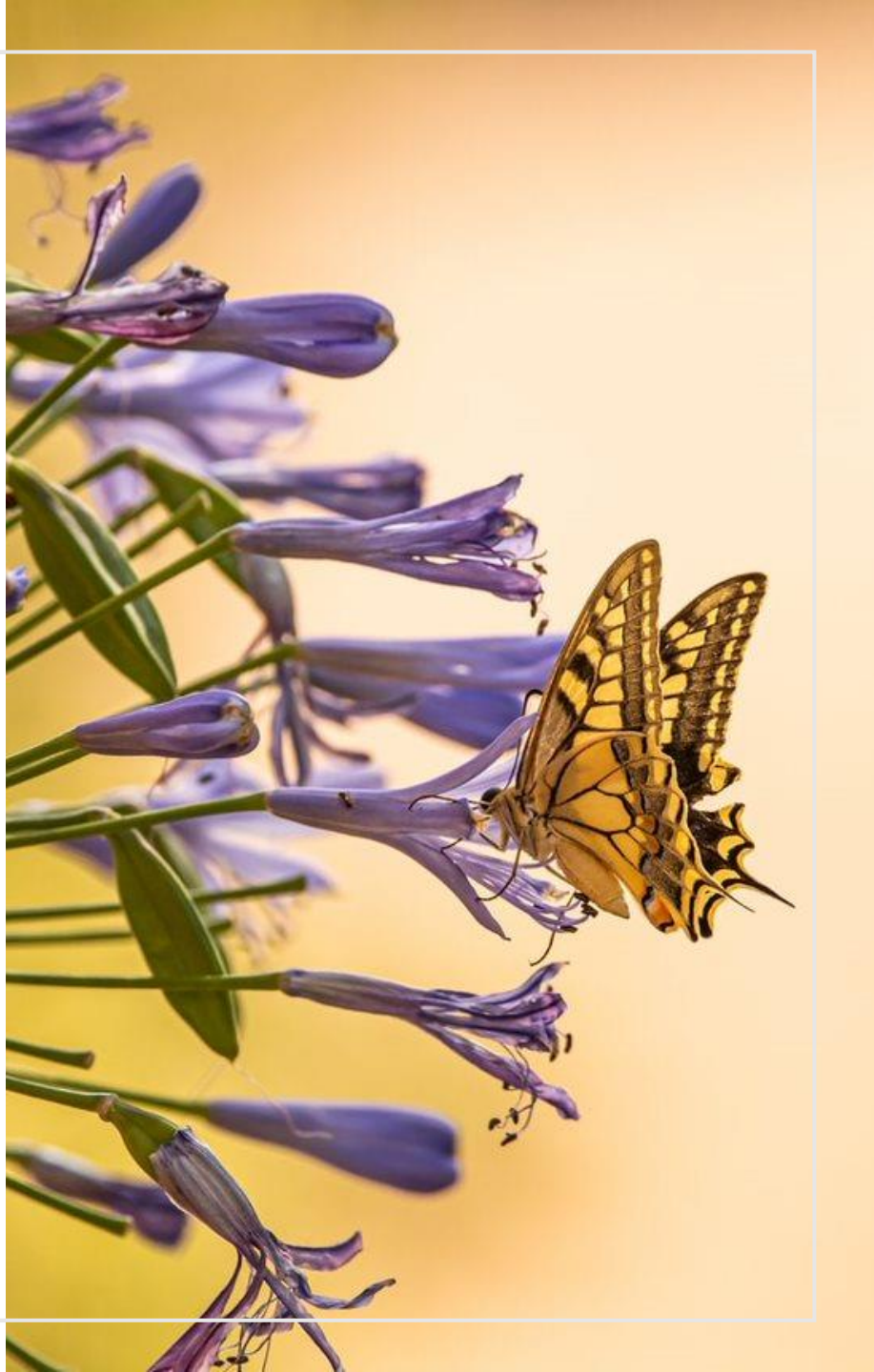
EXTERNAL DRIVERS FOR PRIVATE SECTOR UPTAKE OF NbS



INTERNAL DRIVERS FOR NbS

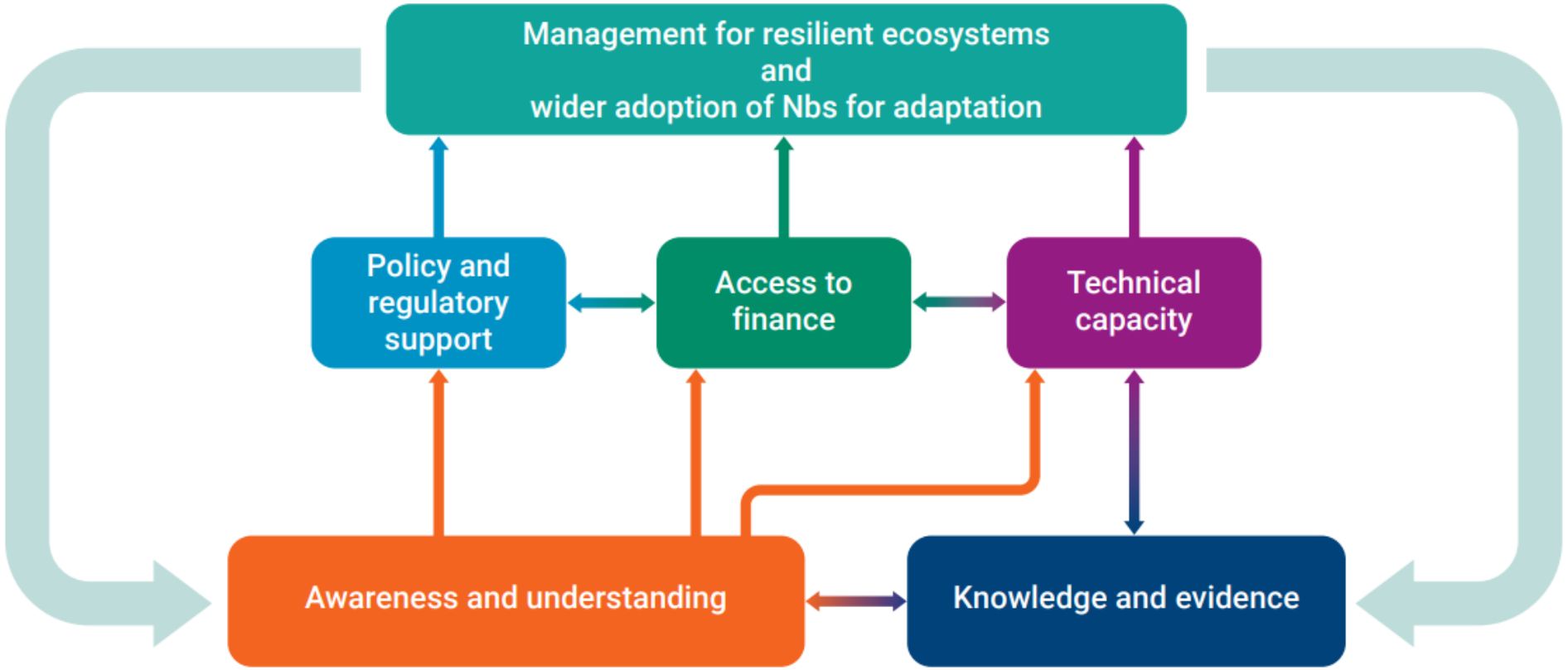
Nature-based Solutions can help to:

- Make cost-effective interventions
- Contribute to internal objectives
- Prepare for potential future regulatory / financing requirements
- Adapt to changing conditions
- Contribute to multiple needs and objectives

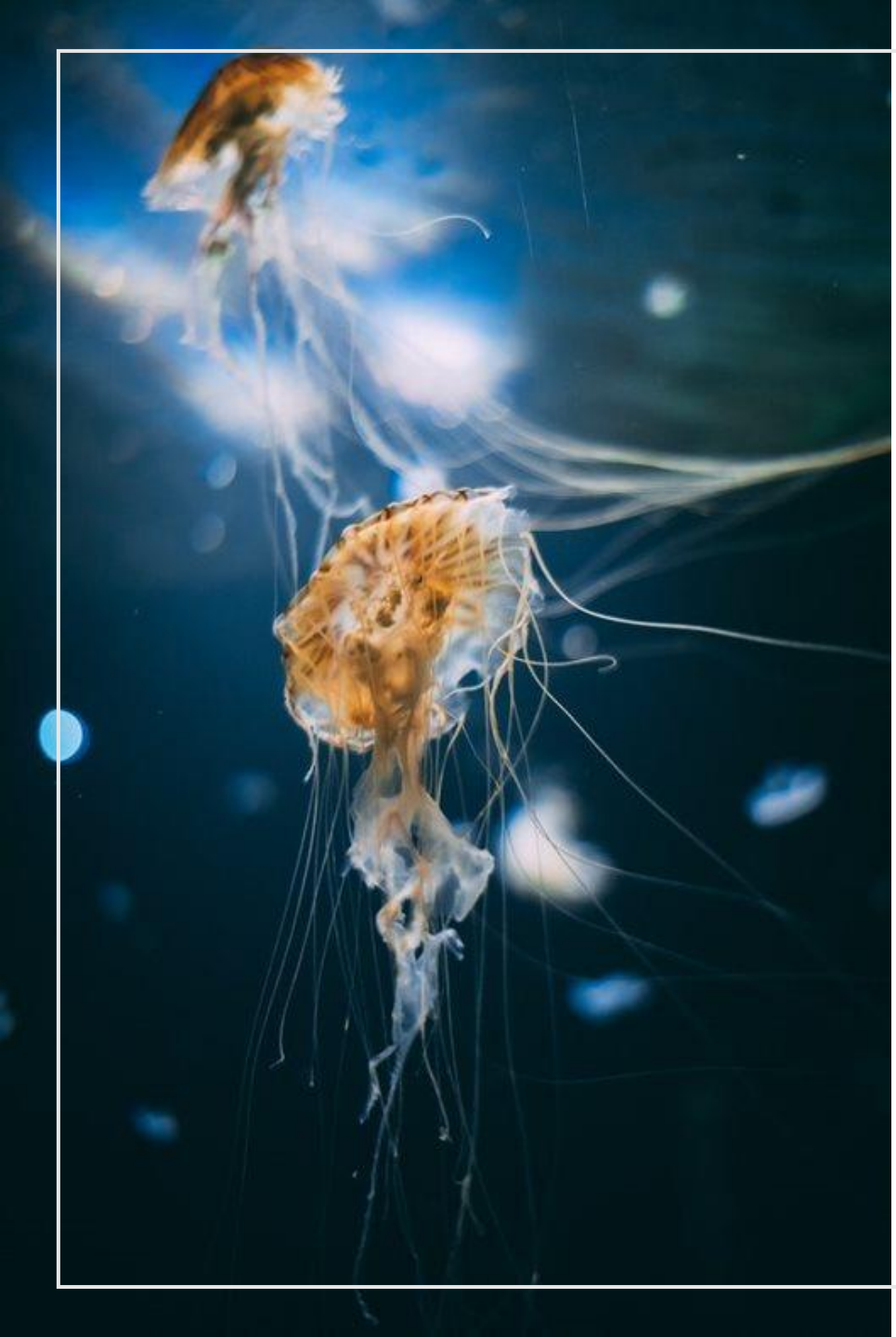


BARRIERS TO WIDER UPTAKE OF NbS

FIGURE 4 Building blocks to support improved management for ecosystem resilience and wider adoption of NbS for adaptation.



Source: Kapos, V., Wicander, S., Salvaterra, T., Dawkins, K., Hicks, C. (2019) The Role of the Natural Environment in Adaptation, Background Paper for the Global Commission on Adaptation. Rotterdam and Washington, D.C.: Global Commission on Adaptation.



OVERCOMING CHALLENGES TO SCALING UP NbS

- Routinely consider NbS for mitigating, adapting to and managing risks related to climate change, biodiversity and pollution-related risks
- Increase awareness and provide sector leadership on use of NbS through building the evidence base (monitor, evaluate, publicize)
- Support public-private partnerships and collaborative governance structures where appropriate
- Ensure proper consultation, planning and safeguards are integrated into project implementation, alongside monitoring, evaluation and management

Natural Climate Solutions VS NbS for Climate Change Mitigation

Bálint Ternyik – Programme Officer – Nature Economy – UNEP-WCMC

WHAT ARE NATURAL CLIMATE SOLUTIONS?

There isn't a widely accepted definition of Natural Climate Solutions.

"*Natural climate solutions are conservation, restoration and improved land management actions that increase carbon storage or avoid greenhouse gas emissions in landscapes and wetlands across the globe.*" – The Nature Conservancy

Natural Climate Solutions can sometimes be considered Nature-based solutions (often termed Nature-based Solutions for Climate Change Mitigation) **IF** they meet certain criteria.

BUT NCS aren't always NbS

TYPES OF NCS

- Solutions that **Protect** ecosystems, particularly those with high carbon stocks and that are under pressure of conversion i.e. avoided forest conversion
- Solutions that **Manage** ecosystems, such as changes to agricultural practices
- Solutions that **Restore** ecosystems, like restoring forests to increase carbon sequestration

THE POTENTIAL OF NATURAL CLIMATE SOLUTIONS

NCS are already available and have been shown to remove carbon dioxide from the atmosphere through biological sequestration

Source: UNEP & IUCN 2021. Nature-based solutions for climate change mitigation

NATURAL CLIMATE SOLUTIONS AT A GLANCE

- NCS can be NbS if they also deliver other benefits e.g. for biodiveristy and human well- being
- A narrow focus on climate change mitigation can lead to actions that:
  - Provide no or limited benefits for biodiversity, communities etc.
  - Have unintended negative consequences
- For example, planting an area of non-native monocultures may sequester carbon, but will have limited / no benefits for biodiversity and people, and may have negative consequences

PITFALLS TO AVOID WHEN WORKING WITH NATURAL CLIMATE SOLUTIONS

- Implementing actions in inappropriate locations e.g. tree planting on peatland
- Not considering the longevity of actions e.g. implementing NbS in areas that will be developed in the near future
- Lack of consultation so interventions don't have community benefits, or have negative consequences e.g. restricted access to important resources

Planning, data and consultation are key to avoiding potential pitfalls!

Potential benefits of different interventions

Katie Dawkins – Programme Officer – Nature-based Solutions – UNEP-WCMC

FORESTS

- Many forests areas are subject to pressure from land-use change and overextraction
- Local communities, wildlife, company operations and other industries may rely on the ecosystems services provided by forests, such as water regulation, soil and substrate management (e.g. reduced erosion, sedimentation, risk of landslides etc) and recreation and / or employment opportunities
- Healthy forests can sequester carbon - while burning of forests can result in substantial carbon emissions
- Protecting, conserving, restoring, sustainably using and managing forests can provide a range of benefits

WETLANDS

- Many wetland ecosystems are under threat from land-use change, overextraction, pollution etc.
- Local communities, wildlife, company operations and other industries may rely on fresh **water** supplies provided by wetlands (among other ecosystem services)
- Healthy wetlands can sequester carbon - while drained peatlands have substantial carbon emissions
- Protecting, conserving, restoring, sustainably using and managing wetlands can provide a range of benefits

MANGROVES

- Many mangroves are under pressure from e.g. pollution and overexploitation
- Local communities, wildlife, company operations and other industries may rely on **coastal protection** provided by mangroves (among other dependencies)
- Mangroves can be important for livelihoods e.g. nurseries for fish populations that support fishing
- Healthy mangroves can sequester carbon
- Protecting, conserving, restoring, sustainably using and managing mangroves can provide a range of benefits

Risks and Opportunities for NbS

Bálint Ternyik – Programme Officer – Nature Economy– UNEP-WCMC

RISKS

- Coastal landscapes are under threat from erosion by sea level rise, storm surges and land-use change
- Operations in coastal areas may be disrupted and assets may be damaged as a result
- Where coastal protection measures are needed, grey infrastructure, nature-based solutions and/or hybrid approaches offer different advantages and disadvantages

GREY INFRASTRUCTURE

- Operational as soon as complete
- Limited (although often long) lifespan
- Potential to impact on coastal ecosystems and disrupt natural processes
- Often built to withstand certain conditions or extreme events, but not adaptable with changing conditions
- Benefits may be fewer if used on their own but can be used in conjunction with other approaches
- Embodied carbon in concrete

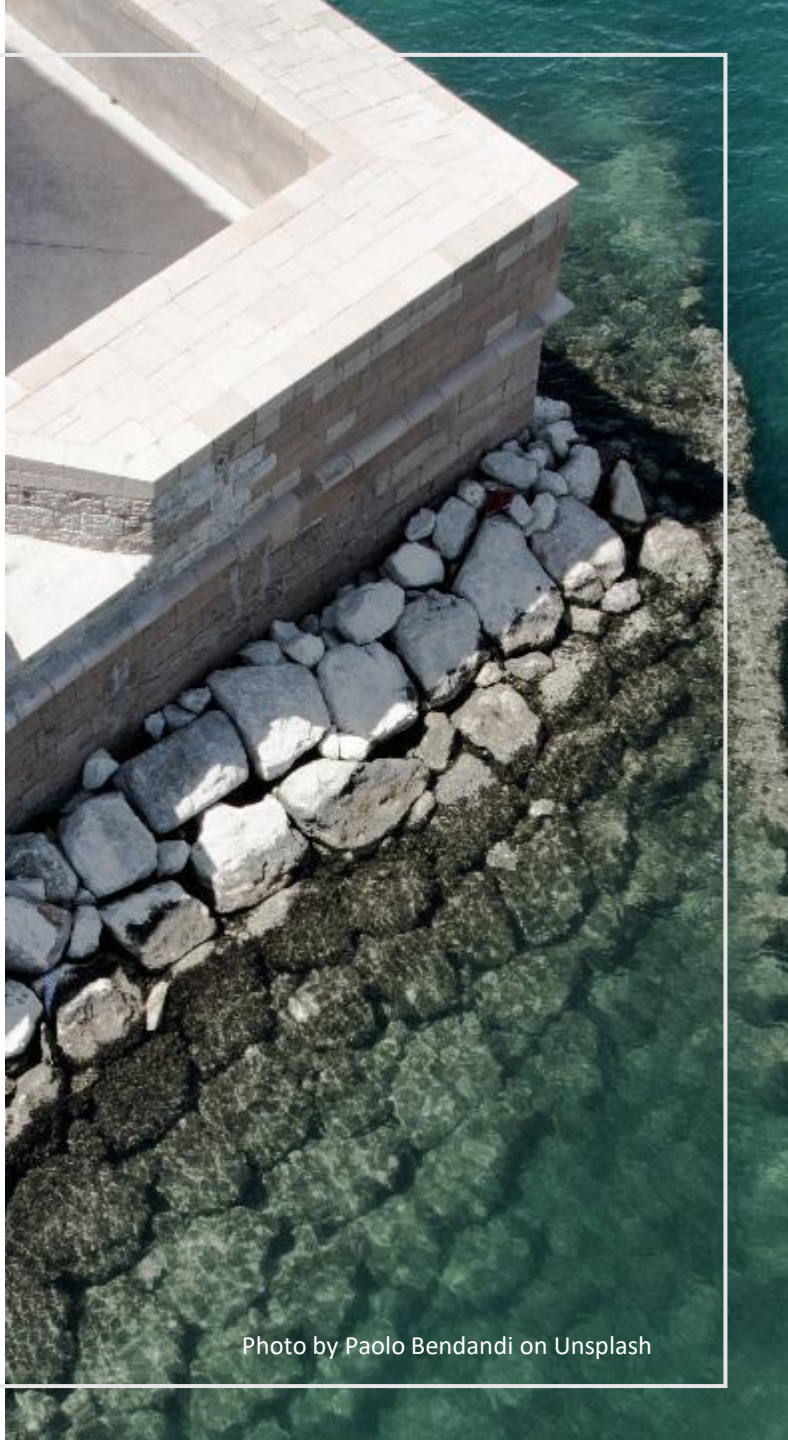


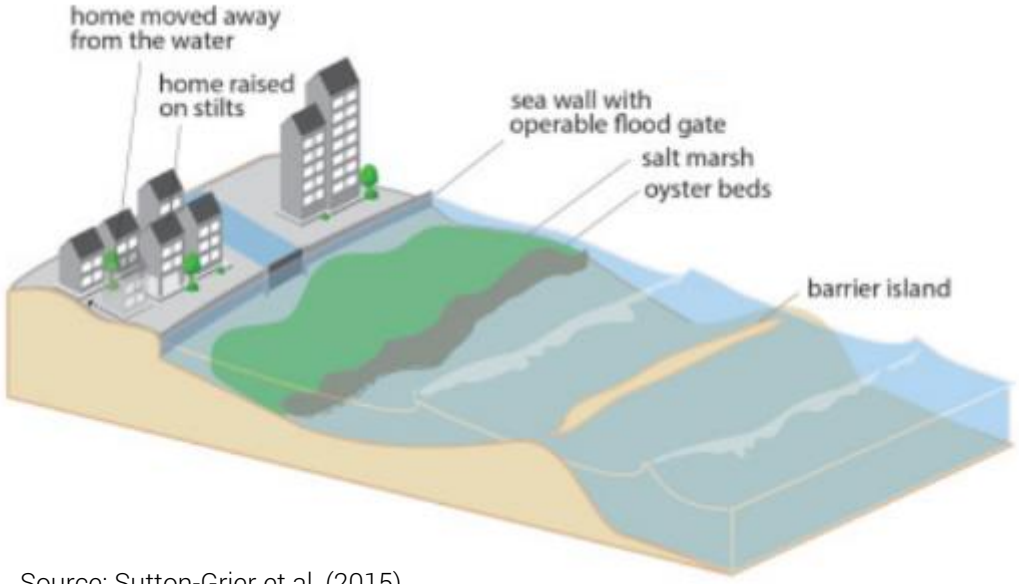
Photo by Paolo Bendandi on Unsplash

NATURE-BASED SOLUTION

- Takes more time until fully “operational”
- Provides benefits e.g. habitat for wildlife and livelihood opportunities for communities
- Can lead to enhanced carbon sequestration or help protect carbon stores
- Potential to adapt to changing environments
- Vulnerabilities e.g. to pollution
- Can be cheaper to implement and maintain than traditional grey infrastructure

HYBRID SOLUTION

- Combines grey and natural solutions
- Can provide benefits (e.g. habitat, recreation, carbon sequestration)
- Enhances the effectiveness of and/or the reduces requirement for grey infrastructure
- Can be used in areas where NbS alone cannot meet a need
- Relatively ‘new’ approach



Source: Sutton-Grier et al. (2015)

MANGROVES

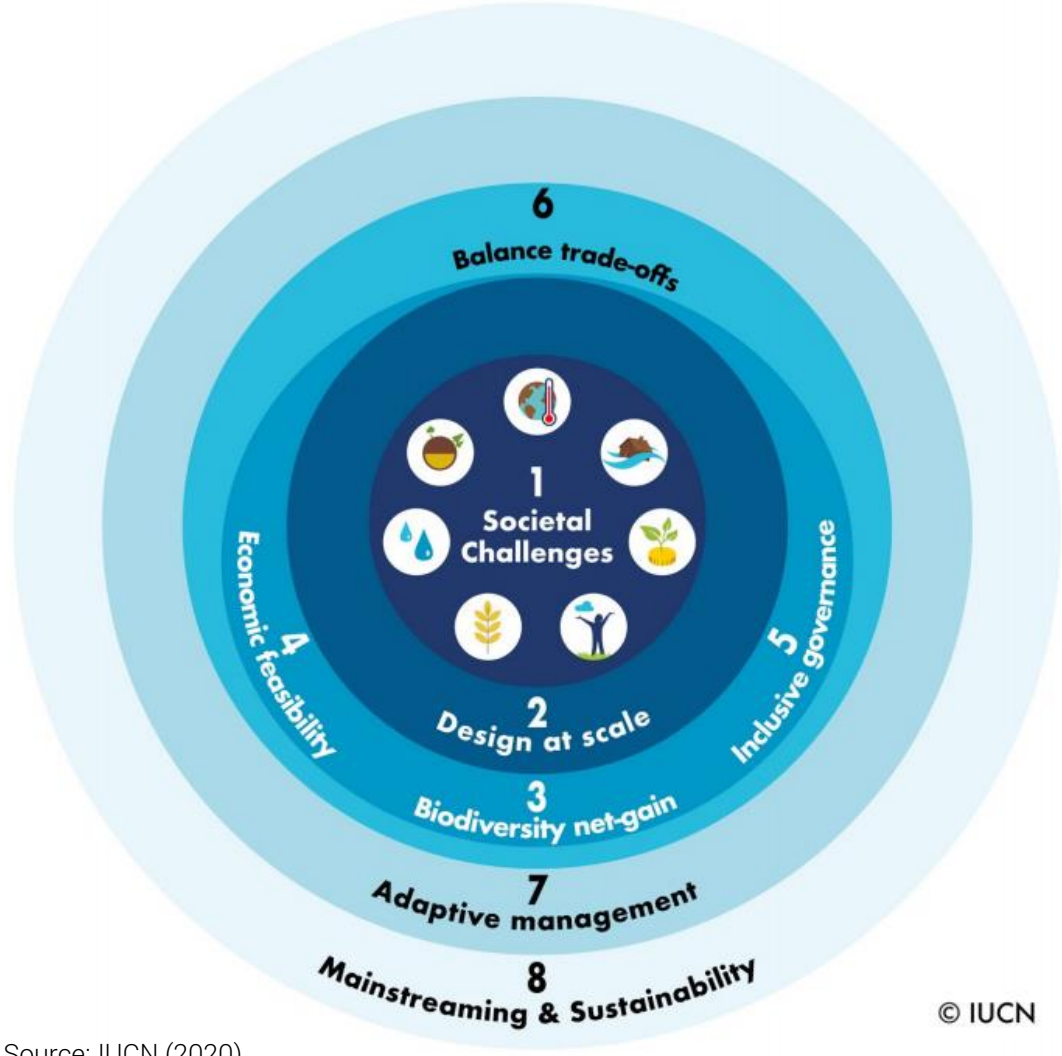
Planning Nature-based Solutions

Katie Dawkins – Programme Officer – Nature-based Solutions – UNEP-WCMC

CONSIDERATIONS FOR IMPLEMENTING EFFECTIVE NbS

- Multiple options
- Uncertainty
- Long-term
- Stakeholder buy-in
- Safeguards
- Addressing pressures

IUCN GLOBAL STANDARD FOR NbS



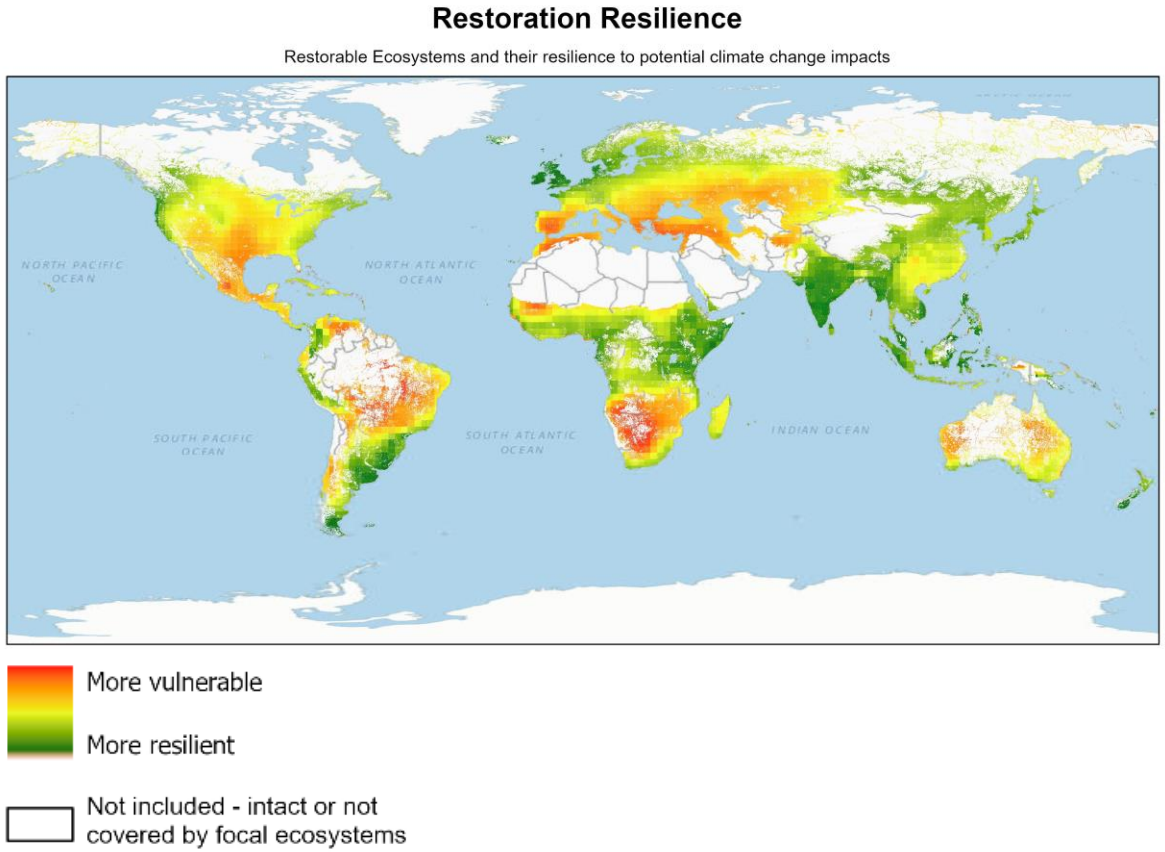
Source: IUCN (2020)

ENGAGEMENT

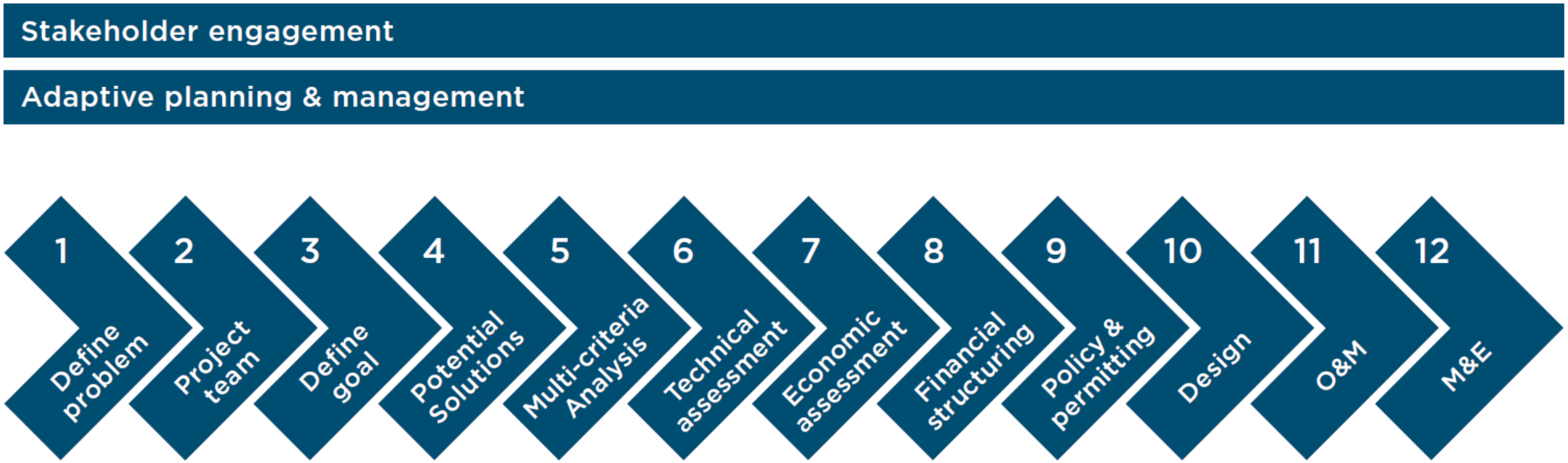
- Robust Environmental and Social safeguards (e.g. IUCN Standard, REDD+, ESG)
- Early, meaningful and ongoing consultation
- Challenges identified and prioritised by stakeholders
- Effectively address challenges, using adaptive management where needed
- Good governance

SCREENING AND EARLY PLANNING FOR NbS

- Stakeholder engagement
- Identify, understand and target benefits
- Screen for suitable sites to support NbS objectives and long-term success
- Consider potential synergies and trade offs



PLANNING FOR IMPLEMENTATION

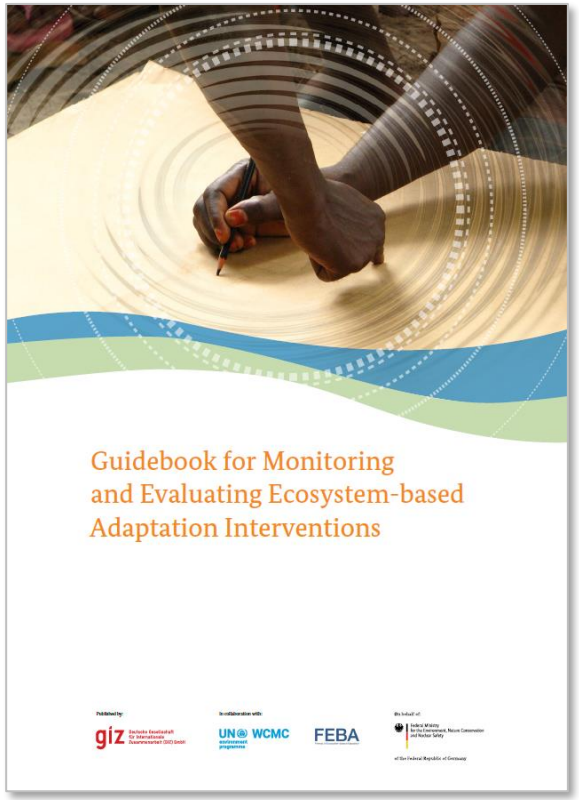


Source: IDB 2020

MONITORING AND EVALUATION

Four steps to keep in mind when designing and rolling out an M&E process for NbS:

1. Developing a results framework
2. Defining indicators and setting a baseline
3. Operationalising the monitoring and evaluation system
4. Using and communicating the results

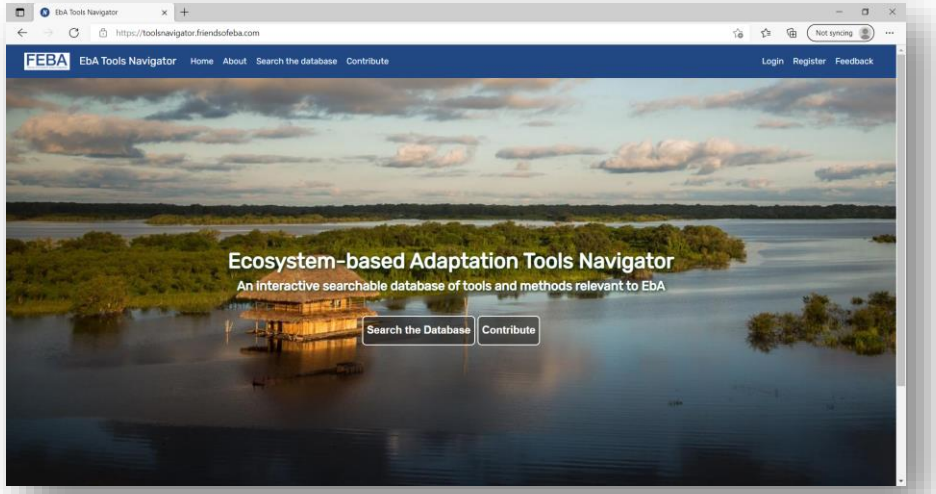


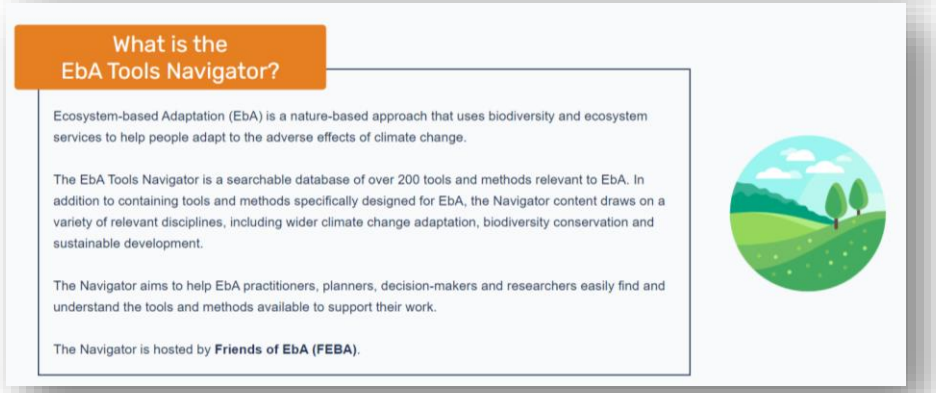
DEFINING INDICATORS, BASELINES AND TARGETS

- Focus on outcome and impact indicators that represent key aspects of the system the NbS is set in
- Link indicators to the results framework
- Indicators need to be context-appropriate – there are no commonly accepted “best” impact indicators yet

ECOSYSTEM-BASED ADAPTATION TOOLS NAVIGATOR

- Searchable database of over 280 EbA-relevant tools and methods
- Find and understand available tools and methods that support one or multiple stages of EbA from *Planning* to *M&E* and *Mainstreaming*
- Additional information such as *resources, time, skills and training required, accessibility, target audience, etc.*





Use cases and case studies

Bálint Ternyik – Programme Officer – Nature Economy– UNEP-WCMC

USE CASE #1: ECOLOGICAL ENGINEERING FOR FLOOD RESILIENCE

- **Challenge**: Populated areas are increasingly under pressure from flooding events
- **Solution**: Implementation of natural catchment measures and floodplain storage
- **Benefits**: Natural habitat protection, community greenspaces, landscape beautification, carbon sequestration
- **Actors involved**: Environmental agencies, local and national park authorities, universities, local communities

Source: Institution of Civil Engineers (2016)

USE CASE #2: ECOSYSTEM-BASED ADAPTATION FOR COASTAL PROTECTION

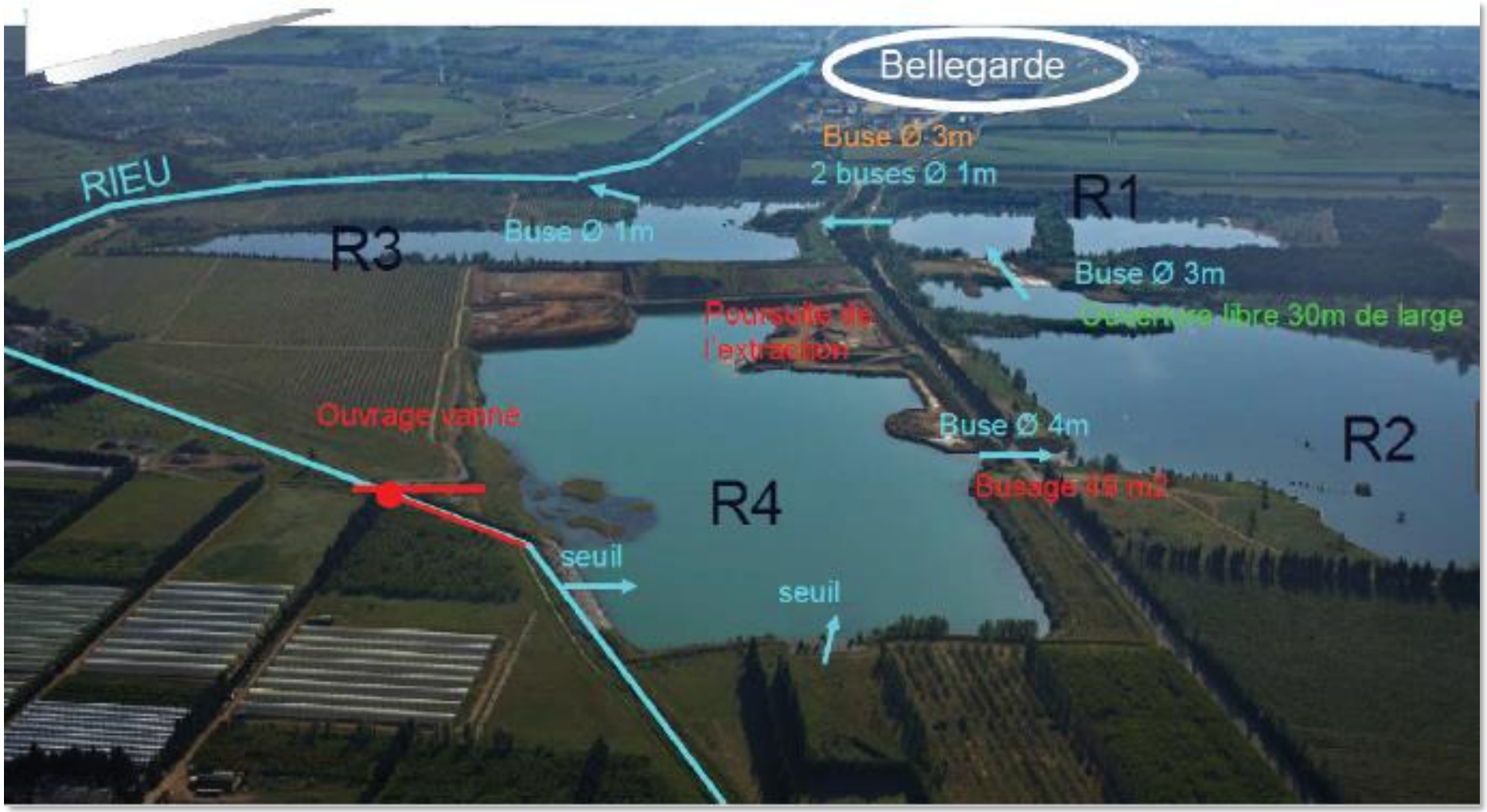
- **Challenge**: Coastal communities and business operations are threatened by flooding and erosion caused by storm surges
- **Solution**: Restoration and sustainable use of mangroves which protect the coastline
- **Benefits**: Habitat provision, increased fish stocks, carbon sequestration
- **Actors involved**: Local communities, businesses, NGOs, donor agencies, experts, government

Source: Marine Conservation Institute (2018)

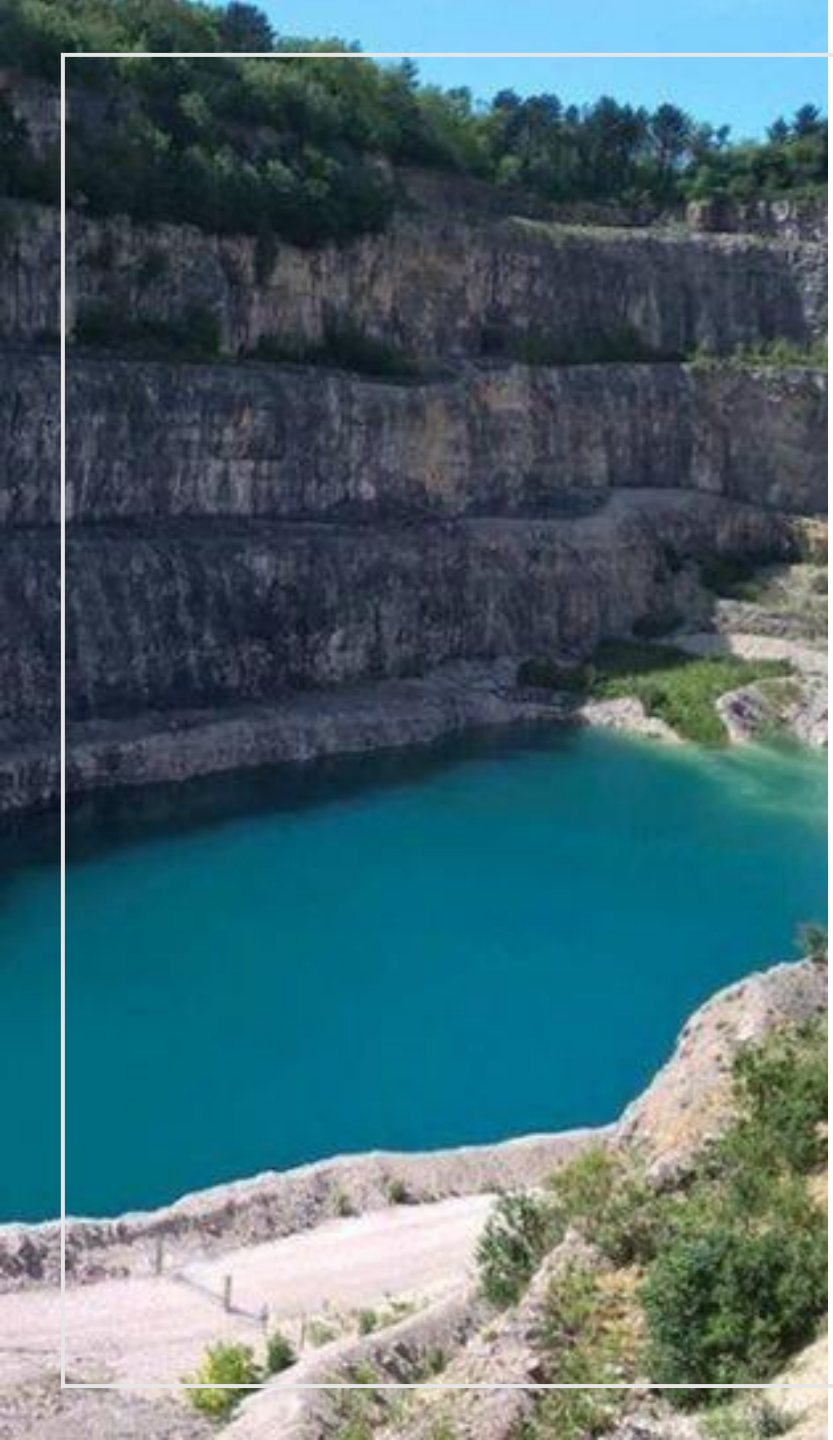
USE CASE #3: RESTORATION AND SUSTAINABLE MANAGEMENT OF FORESTS TO REDUCE FIRE RISK

- Challenge: Communities, businesses and ecosystem services are at increasing risk of forest fires
- Solution: Restoration and sustainable use of forests to manage density, improve structure and reduce invasive species
- Benefits: Reduced fire risk with potential for many other benefits
- Actors involved: Local communities, businesses, NGOs, donor agencies, experts, government and associated agencies

QUARRY BROWNFIELD SITE, BELLEGARDE/ FRANCE



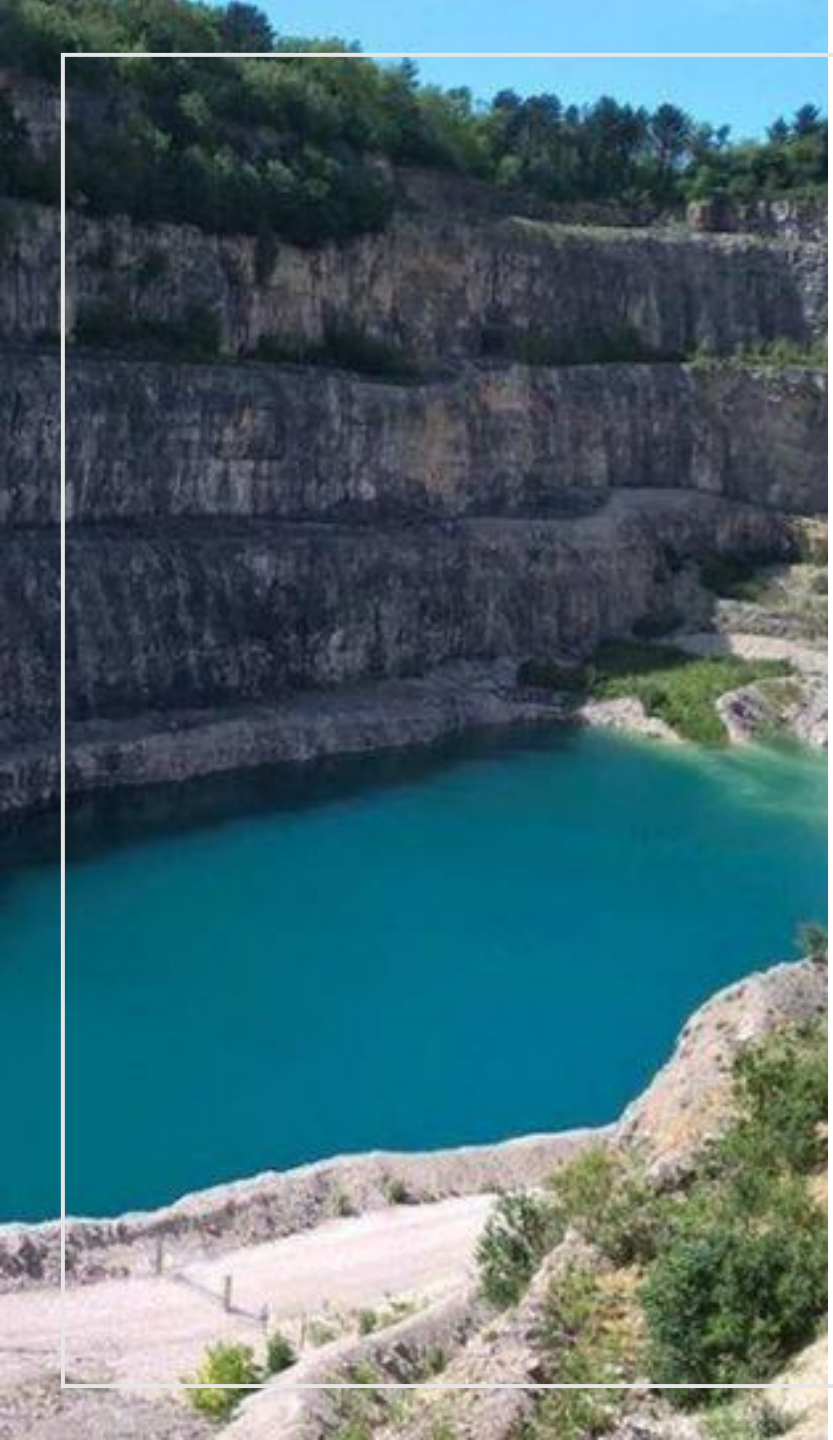
Source: WBCSD (2015) Natural Infrastructure Case Study: Water management and flood prevention in France.



CHALLENGE AND ACTIONS TAKEN

Challenge: Seasonal flooding of sites and adjacent communities (disruption of operations and safety risks)

Actions: Expand flood prevention infrastructure through quarry rehabilitation and creation of wetlands



OUTCOME AND BENEFITS

Outcome: Reduced flood risk to operations and local communities

Benefits: Habitat creation for a variety of species, regulating Ecosystem Services (such as water purification)

NIMR OIL FIELDS, NIMR / OMAN

Source: WBCSD (2015) Natural Infrastructure Case Study: Produced water treatment using reed beds.

CHALLENGE AND ACTIONS TAKEN

Challenge: Need to dispose of / reduce contamination in water

Actions: Construction of a four-tier gravity-based wetland which removes oil from water via microbes, with modular capacity

OUTCOME AND BENEFITS

Outcome: Reduces costs of treating and reinjecting produced water (98% reduction in power consumption)

Benefits: Habitat creation for fish and migratory birds, improved system resilience, carbon sequestration

Summary

Katie Dawkins – Programme Officer – Nature-based Solutions – UNEP-WCMC

NATURE-BASED SOLUTIONS

- Can be applied at a range of scales and in a wide variety of contexts
- Actions to protect, conserve, restore, sustainably use and manage ecosystems
- Address social, economic and environmental challenges, including:

  biodiversity loss, climate change mitigation and adaptation, land degradation, desertification, food security, disaster risks, urban development, water availability, poverty eradication, inequality and unemployment, social development, sustainable economic development, human health, ecosystem services

- Require engagement, consultation, safeguards, monitoring and adaptive management
- Are key to achieving important global goals.

MENTI-QUIZ

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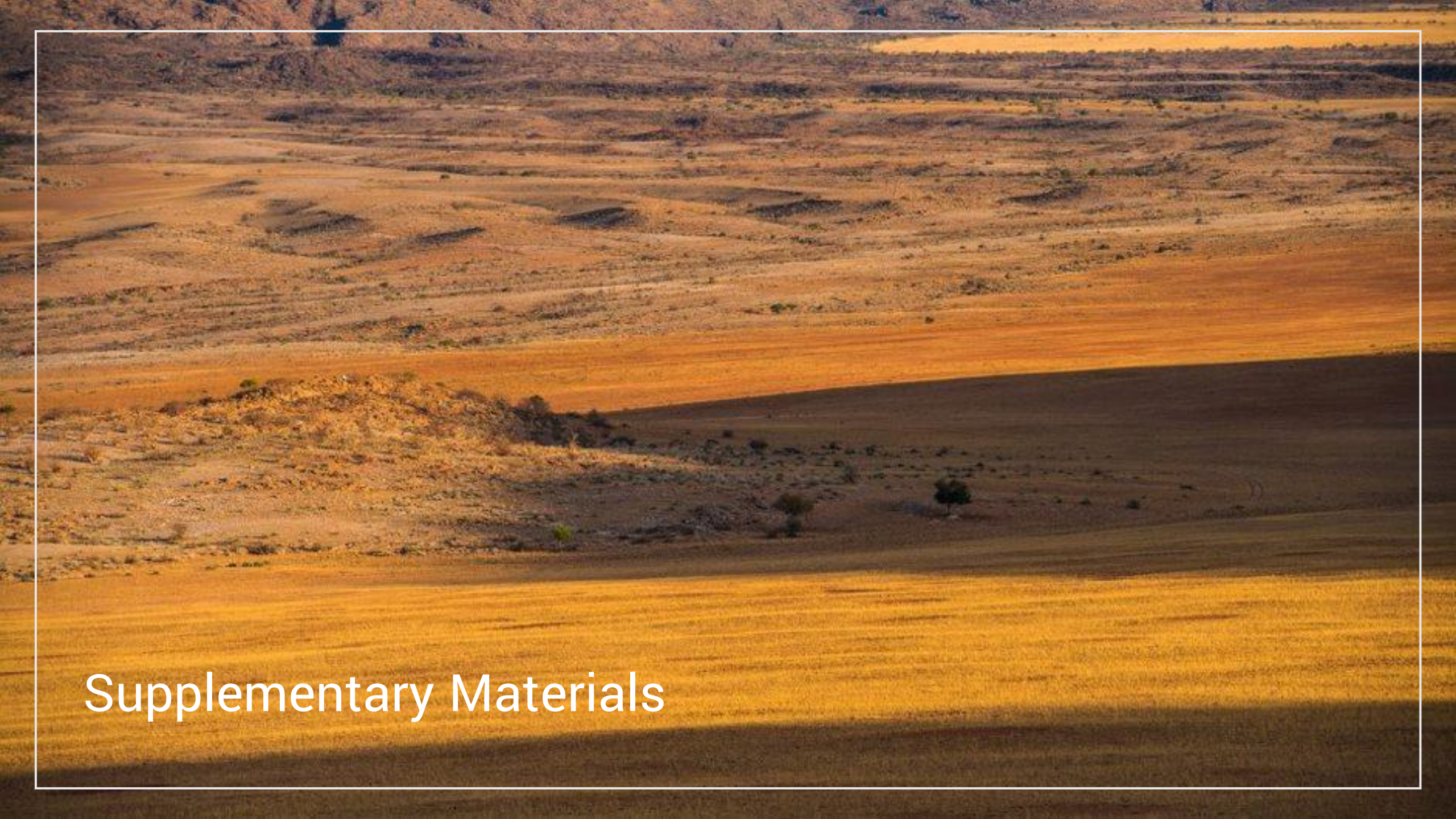

Supplementary Materials

RESOURCES & GUIDANCE

Nature-based Solutions

- IUCN Global Standard for Nature-based Solutions
- Increasing Infrastructure Resilience with Nature-Based Solutions: a 12-step technical guidance document for project developers
- Strategies for Operationalizing Nature-Based Solutions in the Private Sector
- Nature-based Solutions Handbook
- Decision-making in a nature positive world
- Nature Based Solutions For Climate Change Mitigation
- Nature-based Solutions: Opportunities and Challenges for Scaling Up

RESOURCES & GUIDANCE

Ecosystem-based Adaptation (EbA)

- Ecosystem-based Adaptation Tools Navigator: searchable database of EbA-relevant tools
- Guidebook for Monitoring and Evaluating Ecosystem-based Adaptation Interventions
- Adapt now: a global call for leadership on climate resilience

Green / Gray Infrastructure

- Practical guide to implementing green/ grey infrastructure