



**NATURE-BASED SOLUTIONS
INITIATIVE**



**UNIVERSITY OF
OXFORD**

Nature-based Solutions

Promise, evidence, challenges

Nathalie Seddon

Professor of Biodiversity | University of Oxford
Director | Nature-based Solutions Initiative

www.naturebasedsolutionsinitiative.org



- ❖ Nature-based Solutions (NbS) involve **working with and enhancing nature** to address societal goals
- ❖ NbS is an umbrella concept for a multitude of related terms, such as ecosystem-based adaptation (EbA), natural climate solutions (NCS), and eco-disaster risk reduction
- ❖ The concept is grounded in the knowledge that **healthy natural and managed ecosystems produce a diverse range of services** on which human wellbeing depends
- ❖ Extent to which nature brings benefits depends on **how we implement Nature-based Solutions**



Nature as an ally

Examples of Nature-based Solutions

- **Bringing green and blue infrastructure into urban landscapes** to help with cooling and flood abatement, while reducing air pollution and providing other major health benefits
- **Protecting grasslands, forests and wetlands in catchments** to secure and regulate water supplies, and protect communities and infrastructure from floods, soil erosion and landslides
- **Restoring coastal habitats** (mangroves, kelp, reefs and salt marshes) to protect communities and infrastructure from storm surges, salt water intrusion and erosion
- **Planting trees among crops and crops among trees** to stabilise or enhance yields in dryer more variable climates



NbS also have climate change mitigation benefits

- ❖ c.23% global GHG emissions over past decade came from land use change (half from deforestation); land carbon sink stored c. 28% (grasslands, forests, wetlands, coastal habitats, peatlands and agricultural lands incl. soils)
- ❖ Ecosystem stewardship secures these carbon stocks whilst reducing emissions
- ❖ Greatest potential in tropical nations with low GHG emissions and high forest cover
- ❖ **We must avoid turning these carbon sinks into carbon sources**

Global momentum for Nature-based Solutions



- High Ambition Coalition for Nature and People
- Global Deal for Nature in China 2020
- UN Nature Summit 2020
- Nature-based Solutions to Climate Change Manifesto
- WEF 2020: Trillion Trees Platform
- NBS major theme at the UK COP26



NEW YORK DECLARATION ON
FORESTS

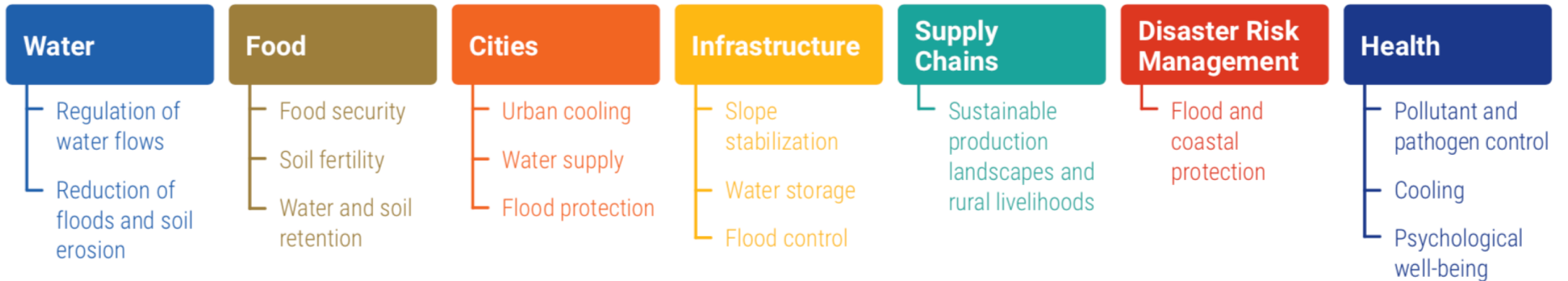


Problem with current policy targets for Nature-based Solutions



- **Encourage planting with single, non-native species** (easier to plant and manage, easy route to market for products *but* low resilience and < carbon stored than intact habitats)
- **Overlook or risk inadvertently replacing other carbon-rich habitats** (i.e. wetlands, peatlands, grasslands)
- **Focus on carbon** (e.g. plantations, bioenergy crops) **overlooks many other benefits**

Nature helps us adapt to climate change in multiple ways



...and at relatively low cost

Cost-effectiveness of NbS



- Benefits of **mangrove restoration** (i.e. fisheries, forestry, recreation and disaster risk reduction) are up to 10 times the costs
- **Coastal defence projects**: NbS 2-5 times more cost-effective compared to engineered structures
- **Saltmarshes**: 23.2 Bn US\$ pa avoided property damage 1980-2007
- **Reefs**: Annual damages from flooding would double and costs from storms would triple in absence of reefs globally

¹ Global Commission on Adaptation. 2019 Adapt now: a global call for leadership on climate resilience

² Narayan S et al. 2016 The effectiveness, costs and coastal protection benefits of natural and nature-based defences. PLoS ONE 11

³ Browder G et al. (2019) World bank report. See <https://www.wri.org/publication/integrating-greengray>.



Nature-based Solutions to Global Challenges

Science • Policy • Practice

The Nature-based Solutions Initiative is an interdisciplinary programme of research, policy advice and education based at the University of Oxford. It brings together natural, physical and social scientists with economists, governance and finance experts from across the University and beyond. Its mission is to enhance understanding of the potential of Nature-based Solutions to address global challenges and increase their sustainable implementation worldwide.



01 Science

Explore our [bibliography](#) for the latest publications on NbS and locate scientific evidence for the effectiveness of Nature-based Solutions to climate change impacts using our [Evidence Platform](#)



02 Policy

Discover [how the world's nations](#) are planning for the impacts of climate change and [learn how](#) to increase climate ambition through Nature-based Solutions



03 Practice

Find out more about our in-country programmes and read about [Nature-based Solutions in action](#) from across the globe

What do good NbS look like?



- **Protection** of *intact* ecosystems (higher carbon sequestration, more resilient, support livelihoods)
- **Restoration** of wide range of ecosystems, not just forests (coastal, grasslands, peatlands, etc)
- **Support biodiversity**, i.e. lots of different species (more resilience to pests and diseases)
- **Implemented by local people** (avoid land grabs; incentivise stewardship; benefit the poor)
- Involve **careful tree-planting** – right species in the right places (diverse plantations, not at the cost of natural grasslands, peatlands, etc)

Case-study: Humbo, Ethiopia

*Community-based forest
restoration for improved livelihoods
and climate change resilience*



Photo: Humbo before the project, and one year on

Activities

Reforestation: Farmer-managed natural regeneration of 2,728 Ha of degraded native forests with living tree stumps

Land rights: Government granted legally binding tree user rights, which gave communities confidence they would benefit from restoration efforts

Capacity-building: Village cooperatives with local government support, with training in forest management, leadership, financial and cooperative management

Pro-poor: Vulnerable households supported with alternative livelihood opportunities (vegetable and honey production) during initial phase

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Photo: Humbo before the project, and one year on

Outcomes

Mitigation: c.870,000 tonnes of CO₂ equivalent removed in 2006-2036

Adaptation: Reduced soil erosion and flash flooding, greater groundwater recharge and higher crop productivity.

Livelihoods: Sustainable production of wood and other forest products; fodder for livestock (more grass thru improved land management); carbon credits sales reinvested in community-driven activities (e.g. micro businesses such as livestock husbandry).

Up-scaling: Humbo's success stimulated the Government of Ethiopia to call for a 15 million hectare scale-up

Tree-planting Lake District

- 150k *native trees* planted in Haweswater Reserve
- Sustainable Catchment Management Programme of United Utilities and RSPB
- Improved carbon sequestration, water quality and biodiversity
- Hill farms run as viable businesses



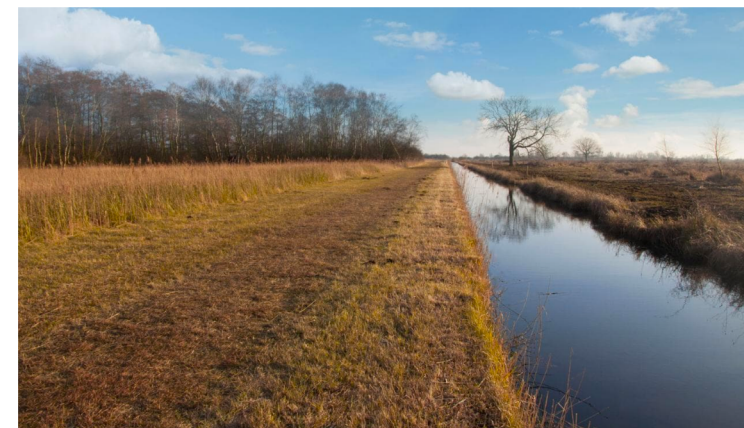
Restoring natural grasslands South Downs

- Restoration from winter cereal fields
- Protected a housing estate from muddy floods for c20 years
- Lowered flood-risk by reducing the area contributing to runoff, and by stopping valley floor flows linking up.



Restoring wetlands Cambridgeshire

- Farmland adjacent to Wicken Fen Reserve restored to a mosaic of wetland and terrestrial habitats
- Net benefit to society through greater flood protection, reduced green house gas emissions and increased income from nature-based recreation

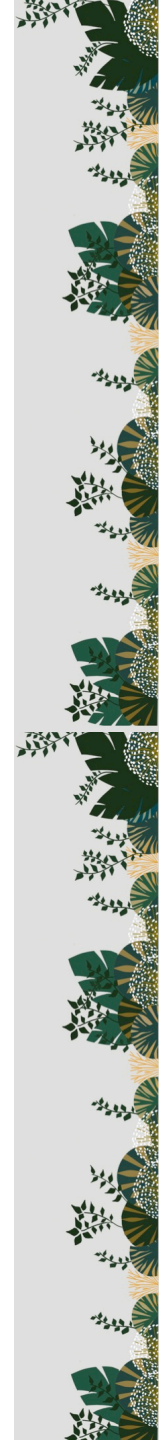


Getting the message right on NbS in 2020+

Working with the UK Government CoP26 Unit and UN agencies, in collaboration with partners from the conservation and development sectors.

Successful Nature-based Solutions:

- Are a vitally important part of the climate solution but are **not a substitute for a rapid fossil fuel phase-out** and must not delay urgent action to decarbonise our economies
- Involve the **protection and/or restoration of a wide range naturally occurring ecosystems** on land and in the sea (not just woodland/forests)
- Are implemented with **full engagement of local communities including farmers**
- **Sustain or enhance biodiversity**



Nature-based Solutions to Climate Change

Key messages for decision makers in 2020 and beyond

13 February 2020

To the Rt Hon Alok Sharma MP

Many congratulations on your appointment as President of CoP26. We are writing to you as a group of UK-based research, conservation and development organisations to offer our support in the development of your programme of work for Nature-based Solutions (NbS). In particular, we invite you to consider some clear definitions and guiding principles around NbS and their implementation that should ensure they benefit the climate, nature and people, and to encourage the adoption of such guidelines by other Parties to the UN Framework Convention on Climate Change (UNFCCC).

The potential of NbS to address the climate and biodiversity crisis is an important element of an overall strategy as they can be low-risk and cost-effective. Therefore, we welcome the new attention that is being focussed on this previously neglected area and are excited about the opportunities offered both by the Glasgow UNFCCC CoP26 and the upcoming CBD CoP15 summit.

We are also committed to ensuring that the evidence-base underpinning the application of NbS is rigorous, and will use this year to improve our common understanding of what NbS are and how they can best be implemented.

See: www.nbsguidelines.info
sent to RH Alok Sharma on 13 Feb 2020



Nature-based Solutions Initiative,
University of Oxford



Royal Society for the Protection of
Birds



Environmental Change Institute,
University of Oxford



Zoological Society of London



International Institute for Environment
and Development



Fauna & Flora International



Wildlife Conservation Society



World Wide Fund for Nature



BirdLife International



Environmental Modelling Group,
University of Aberdeen



British Ecological Society



Capitals Coalition



UK Centre for Ecology and Hydrology



Smith School for Enterprise and
Environment, University of Oxford



Department of Zoology, University of
Oxford



Naturvation, University of Durham



Environmental Investigation Agency



World Vision UK

NbS



CONFERENCE 2020



7-9 JULY
2020
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