

Nature-based solutions and the G20

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Abstract: Nature-based solutions (NBS) and ecosystem-based approaches have assumed importance in the past three G20 presidencies. The G7 has emphasised the role of NBS too. The approach aims to ‘conserve, manage, and restore natural and modified ecosystems in ways that address social, economic, and environmental challenges’. The Indian presidency also proposes the concept of LiFE (Lifestyles for Environment) which involves lifestyle transformation at the individual and community levels. This paper focuses on the need to evolve a common understanding of the NBS despite a variety of nomenclatures used, and scale it up for further implementation.

Introduction

Nature underpins the functioning of all societies, providing a wide range of benefits which are often termed ‘ecosystem services’. However, where ecosystems are degraded and biodiversity is lost, the capacity of nature to deliver these benefits is reduced. The term ‘nature-based solutions’ refers to actions that conserve, manage and restore natural and modified ecosystems in ways that address a range of social, economic and environmental challenges (UNEP, 2022). So while this term is relatively new and alternative terms are preferred by some, the concept of nature-based solutions builds on a long-standing recognition of our dependence on nature. Moreover, it emphasises the positive role that working with nature can play in addressing diverse challenges.

In recent years, the importance of nature-based solutions has been

increasingly emphasised by the G20. The previous three Presidencies have all highlighted this. Under the Presidency of Saudi Arabia in 2020 the Leaders Declaration acknowledged “the importance of fostering synergies between adaptation and mitigation, including through nature-based solutions and ecosystem-based approaches” (G20, 2020). In 2021, the G20 Rome Leaders’ Declaration, under the Italian Presidency, committed to “scale up and encourage the implementation of Nature-based Solutions or Ecosystem-based Approaches as valuable tools providing economic, social, climate and environmental benefits including in and around cities, in an inclusive manner and through the participation of local communities and indigenous peoples” (G20, 2021). The Indonesian Presidency in 2022 renewed the commitment to “step up efforts to halt and reverse biodiversity

loss, including through nature-based solutions and ecosystem-based approaches, support climate mitigation and adaptation, enhance environmental conservation and protection, sustainable use and restoration, responding to natural disasters, reduce ecosystem degradation, enhance ecosystem services and to address issues affecting the marine and coastal environment” (G20, 2022).

Under Indian Presidency of the G20, there are already strong signals of building the earlier commitments. The Environment and Climate Sustainability Working Group has identified one of its three priority areas as arresting land degradation, accelerating ecosystem restoration and enriching biodiversity (G20, 2023a). The LiFE (Lifestyles for Environment) programme, with its focus on changing individual and community action to promote an environmentally conscious lifestyle, provides a broader, supportive context for this priority. Additionally, there are also links to the G20 High Level Principles on Lifestyles for Sustainable Development, including through Principle 1 (promote linkages between development, environment and climate agendas and their associated goals), Principle 5 (mainstream sustainability of all components/aspects of the economy) and Principle 7 (recognise and amplify the role of local communities, local and regional governments and traditional knowledge in supporting sustainable lifestyles) (G20 2023c).

The G20’s increased attention to nature-based solutions is reflected in the wider landscape of global decision-making. There are references to nature-based solutions included in both the Sharm el-Sheikh Implementation Plan (United Nations Framework Convention on Climate Change, 2023) agreed at

UNFCCC COP 27 and the Kunming-Montreal Global Biodiversity Framework (Convention on Biological Diversity, 2023) CBD COP 15.

The recent Presidencies of the G7 have also emphasised the importance of nature-based solutions. This is shown in the Communiqués issued by the Climate and Environment Ministers of both the UK and Germany Presidencies in 2021 and 2022 respectively. The UK document recognises “the crucial role of nature-based solutions in delivering significant multiple benefits for climate mitigation and adaptation, biodiversity and people” and the Ministers committed to “strengthen their deployment and implementation” (G7, 2021). In the German Communiqué, the ministers committed to “substantially increase our national and international funding for nature by 2025 including increased funding for nature-based solutions” (G7 2022). To the extent that there is support for building closer alignment between the G7 and G20, nature-based solutions may be one policy issue where such alignment may be possible.

It should also be noted that in 2022 the United Nations Environment Assembly (UNEA) agreed resolution 5/5 entitled “nature-based solutions for supporting sustainable development” (UNEP, 2022). A number of G20 countries, including Argentina, Australia, Brazil, Canada, France (on behalf of the European Union), Russia, South Africa, UK and USA played a leading role in the negotiation of the resolution. It includes a definition of nature-based solutions which states: *nature-based solutions are 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, resilience and biodiversity benefits (UNEP, 2022). This is the first multilaterally agreed definition of nature-based solutions. The resolution also calls for inter-governmental consultations on nature-based solutions.

These consultations are taking place in 2023 and one of the issues that is being addressed is the diversity of terms that are used in this context. As already mentioned, sometimes the term 'nature-based solutions' is coupled with the expression 'ecosystem-based approaches'. There are also a wide range of other terms that are used to refer to what some would regard as specific types of nature-based solution. These include ecosystem-based adaptation; ecological infrastructure; conservation agriculture; regenerative agriculture; and eco-disaster risk reduction. This paper does not address the various definitions of terminology further, on the grounds that many of these other terms do embody similar ideas and perspectives.

In addition to the recent political commitments to scaling up the use of nature-based solutions, expressed by leaders of the G20, the extensive use of nature-based solutions in many G20 countries should also be noted. Illustrations of these, covered in subsequent solutions, provide an explication of the concept of nature-based solutions and offers some recommendations for consideration of the G20.

Concept of Nature-based Solutions

To understand the concept of nature-based solutions, it helps to distinguish three different elements in the concept. First, nature-based solutions

involve working with different types of ecosystems, natural or modified. These systems may be terrestrial (e.g. forest, farmland, mountain and urban), freshwater (e.g. river, lake, peatland and wetland) and coastal and marine (e.g. mangrove and salt marsh).

Second, nature-based solutions use and work with nature in different ways, which can be broadly categorised as involving the conservation, sustainable management, or restoration of ecosystems. In practice, nature-based solutions often involve combinations of these types of action. For example, regenerating degraded areas may include components of both conservation and active restoration. Importantly, nature-based solutions often involve hybrid solutions where "green/blue infrastructure", such as woodland strips, green roofs, and wetlands, among others, are combined with "grey infrastructure" such as dams, pumps, retaining walls and storm drains to provide various benefits from flood control, to cooling effects, biodiversity benefits, and human wellbeing (European Environment Agency, 2015; European Commission, 2015; Kabisch, Korn, Stadler & Bonn, 2017).

Third, nature-based solutions are, as the name makes clear, solution-oriented (Albert, *et al.*, 2019), reflecting the fact that they can be used to address a range of social, economic, and environmental challenges (International Union for Conservation of Nature, 2020; UNEP, 2022) such as climate change and disaster risk reduction, land degradation, biodiversity loss, and unemployment. In addition, nature-based solutions are often explicitly targeted at more than one challenge, and able to deliver benefits across a range of goals. For example, nature-based solution for adaptation to

climate change such as conservation and restoration of mangroves can help reduce coastal flood risk. If well designed and implemented, it may also increase carbon uptake and storage, conserve biodiversity and provide opportunities for sustainable livelihoods (UNEP, 2021). Investment in nature-based solutions for disaster risk reduction, along with integrating gender-responsive policies, can enhance the community-based adaptive capacities, and contribute to gender equality and empowerment (United Nations Office for Disaster Risk Reduction, UNEP & Partnership for Environment and Disaster Risk Reduction, 2021).

The three dimensions of nature-based solutions – the type of ecosystem where the intervention is made, the different ways in which these interventions work

with ecosystems, and the different kinds of social, economic and environmental challenge which they address – entail that there is a wide diversity of nature-based solutions, varying along these three dimensions (see Table 1).

In addition to the types of nature-based solutions that are summarised in Table 1, there is a growing body of research that focuses on the opportunities for and benefits from the implementation of nature-based solutions in G20 countries.

- Food security among the rural poor in India is closely linked to poverty and agricultural productivity. A study of smallholder farmers in Odisha compared the conventional tillage of maize with an approach utilising conservation agriculture techniques, including reduced tillage

Table 1: The Three Elements of Nature-based Solutions

Type of Nature-based Solution	Three elements		
	Working with Different Ecosystems	Working with Ecosystems in Different Ways	Addressing Challenges
Combination of natural biocontrol products for coffee crops, improving habitats for natural enemies of insect pests, and promoting agroforestry practices to provide shade for the coffee plants (CABI, 2021a; 2021b).	Farmland; plantations	Sustainable Management	<ul style="list-style-type: none"> • Pest regulation • Economic development • Climate adaptation
Restoration of natural forests under community management and promotion of agroforestry for carbon storage and diversified local livelihoods (United Nations Development Programme, 2022)	Forests; farmland	Sustainable management Restoration	<ul style="list-style-type: none"> • Climate change mitigation • Land degradation • Food security • Biodiversity loss
Introducing wildlife management in protected areas to support wildlife-based tourism to diversify pastoralist livelihoods (Chausson, Turner, Seddon, Chabaneix, Girardin, Kapos, V. et al., 2020; Osano, Said, Leeuw, Moiko, Kaelo, Schomers et al., 2013).	Grasslands; pastoral lands	Conservation Sustainable Management	<ul style="list-style-type: none"> • Biodiversity loss • Poverty alleviation

Table 1 continued...

Blocking drains and rewetting peatlands to re-establish their hydrology, and where needed apply paludiculture to support livelihoods (Strack, Davidson, Hirano & Dunn, 2022; Tanneberge, Appulo, Ewert, Lakner, Brolchain, Peters, <i>et al.</i> , 2021).	Peatlands	Conservation Sustainable Management Restoration	<ul style="list-style-type: none"> • Climate change mitigation • Water security • Biodiversity loss • Land degradation
Riparian buffer and floodplain management and restoration to manage flooding and reduce infrastructure assets at risk (Kapos, Wicander, Salvaterra, Dawkins & Hicks, 2019).	Rivers; floodplain	Conservation Sustainable Management Restoration	<ul style="list-style-type: none"> • Climate change adaptation • Disaster risk reduction
Constructed or restored wetlands for water filtration and pollution abatement, flood control and restoration of biodiversity (Nagabhatla, 2018).	Freshwater (wetlands)	Sustainable Management Restoration	<ul style="list-style-type: none"> • Disaster risk reduction • Water security • Biodiversity loss
Network of effectively managed marine protected areas to maximise conservation of biodiversity while protecting the assemblage of fished species harvested outside the protected areas, benefiting local fisheries (Grorud-Colvert, Claudet, Tissot, Caselle, Carr, Day, <i>et al.</i> , 2014; Eggermont, Balian, Azevedo, Buemer, Brodin, Claudet, J <i>et al.</i> , 2015).	Marine / Coastal	Conservation	<ul style="list-style-type: none"> • Biodiversity loss • Poverty alleviation • Food security
Restoration and conservation of seagrasses aiming to stabilise sediments while providing habitat for invertebrates and fish (Nature-based Solutions Initiative 2022; Kapos, Wicander, Salvaterra, Dawkins & Hicks, 2019).	Marine / Coastal	Conservation Restoration	<ul style="list-style-type: none"> • Biodiversity loss • Disaster risk reduction • Pollution
New assemblages of organisms for green roofs and walls to mitigate city warming and clean polluted air (Eggermont, Balian, Azevedo, Buemer, Brodin, Claudet, J <i>et al.</i> 2015; European Commission, 2015).	Urban	Sustainable Management	<ul style="list-style-type: none"> • Climate change adaptation • Pollution • Health and wellbeing
Renaturalisation of abandoned urban areas via community-based green space to promote cultural identity and recreational spaces (URBiNAT, 2022).	Urban	Sustainable Management Restoration	<ul style="list-style-type: none"> • Health and wellbeing • Sustainable cities & communities
Protection of key micro-headwaters by local community agreements, while restoring mountain wetlands (Peru Ministry of Environment, 2019).	Mountains/ highlands; wetlands	Conservation Restoration	<ul style="list-style-type: none"> • Water security • Poverty alleviation

Sources: Compiled from Various Sources.

and intercropping with cowpeas. This led to an improved maize yield of 60-70 per cent (Chan *et al.*, 2017)

- Brazil's Atlantic forest is one of the most degraded biomes in the country. While it remains a biodiversity hotspot and plays an important role in water provision, it needs restoration. One study has urged the value of agroforestry, as practiced by smallholder farmers, as an important means of restoring the forest. The studies note that the smallholders have reported higher soil moisture on their plots and higher proportions of household food produced on their farms. They also emphasise the importance of full inclusion of smallholder farmers in the planning and implementation of restoration, with appropriate policy support and access to finance (Shennan-Farpon, Mills, Souza, & Homewood, 2022).
- A South African study of the potential contribution of ecological infrastructure argues that while the development agenda may increase the potential risk of degradation of the natural environment it also creates opportunities to demonstrate how the rehabilitation and maintenance of ecological infrastructure can provide a complementary mechanism for contributing to development objectives. The study cites research showing that the livelihood benefits from urban wetlands in Cape Town is worth \$1,570/ha/year. Further, investment in ecological infrastructure can contribute to job creation as well. The study cites the well-known Working for Water programme which removes invasive species to improve ecosystem services, including water supply. The programme employs around 9,000 people per year, of whom about 50 per cent are women. The programme

has increased from supporting 10 projects in 1995 to over 300 projects in 2015 (Cumming *et al.*, 2017).

- In a different context, a study from India makes some similar points to the South African research. It also emphasises the importance of combining ecosystem-based approach with engineered water resource governance and management. The study focused on the semi-arid landscapes of the Banas Catchment in Rajasthan and note that engineered solutions enable the technically efficient extraction and distribution of water toward areas of demand, whether urban or agricultural. But they also argue that this is not combined with resource regeneration which can lead to many adverse ecological and human consequences. In this case, the restoration or establishment of groundwater recharge practices, particularly in the upper catchment is recommended. These re-charge practices are largely ecosystem-based (Everard *et al.*, 2018).

The diversity of these examples, across different ecosystem, with different forms of intervention and serving to address different challenges, gives an indication of the broad range of nature-based solutions. It also illustrates the diversity of terminology that is used in this context, including terms such as ecosystem-based approaches, conservation agriculture, agroforestry and ecological infrastructure.

Way Forward

The severity and urgency of the various challenges that societies face implies that if nature-based solutions are to deliver for people and biodiversity in a changing world, they need to be substantially and rapidly scaled up (Dick *et al.*, 2017).

The solutions broadly split into two categories. The first category comprises different types of nature-based solutions and second category covers actions that contribute to building a common understanding of nature-based solutions.

Types of Nature-based Solution

Different nature-based solutions can be classified along three different dimensions (the type of ecosystem they focus on; the type of intervention they involve; and the social, economic or environmental challenge that they address).

Some of those include the followings:

Action to address land degradation and accelerate ecosystem restoration

This would build on the work of the Saudi Arabia Presidency on addressing land degradation and reflect India's priorities, including on the restoration of abandoned mine sites and of forest fire impacted areas. It would represent a significant contribution to the UN Decade on Ecosystem Restoration (UNEP and FAO of the United Nations) in addition to the Ganges River Rejuvenation (UNEP and FAO of the United Nations, 2022), which is one of the Decade's ten Flagship programmes.

Highlight the contribution of nature-based solutions to the creation of employment

The contribution of nature-based solutions to creating sustainable jobs, including for youth, is being increasingly recognized (ILO, UNEP and IUCN, 2022). This focus would be consistent with the Chair's summary from the G20 Foreign Ministers' meeting in March 2023, which noted that the "digital economy and green transitions are fundamentally

changing the nature of work and leading to new jobs and tasks. Skilling, re-skilling and upskilling of the workforce, particularly under-represented workers, including women, youth and persons with disabilities, is essential" (G20, 2023b). Such an initiative would also build on the Mahatma Gandhi National Rural Guarantee Scheme, which is the world's largest Public Employment Programme and currently by far the largest source of nature-based solutions related employment.

Scale up the use of nature-based solutions for climate change

The use of nature-based solutions for climate mitigation can make significant contribution to address environmental and economic challenges in the short term (UNEP & IUCN, 2021). It will be vital to acknowledge that the use of nature-based solutions does not replace the need for rapid, deep and sustained reductions in greenhouse gas emissions from fossil fuel usage. G20 political leadership on this issue could play a significant role.

Build a Common Understanding of Nature-based Solutions

Several terminologies are used in the context of nature-based solutions. In the commitments to support nature-based solutions, including those made under the previous presidencies of the G20, the term has always been coupled with 'ecosystem-based approaches'. The same linkage is also found in the Sharm el-Sheikh Implementation Plan and the Global Biodiversity Framework.

The diversity in the terminology that is used to describe nature-based solutions reflects both the different institutional contexts in which the term and its synonyms have emerged, and the wide range of challenges that these solutions can address. Nevertheless, this diversity

is one barrier to building a common understanding.

The G20 is well-placed to promote development of a common understanding of nature-based solutions including through the dissemination of examples of best practices and the development of guidelines for the implementation of such solutions. This play a complementary role to the broader inter-governmental consultations on nature-based solutions that are currently being supported by the United Nations Environment Programme.

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