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Rethinking Nature:

A Pathway towards
Sustainable
Development?

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Executive Summary

Nature and people are interconnected, thoroughly. But, our current approaches and actions to speed up economic growth are harming nature. Rapid industrialization, unplanned urbanization, and excessive resource utilization are changing the quality of our ecosystems and, of course, changing our climate. To ensure sustainable, healthy societies we need to learn from nature and incorporate it when solving our development and societal challenges.

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Cover Photo:

Swamp forest in Tanguar Haor
- a Ramsar Site, Sunamganj,
Bangladesh.
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It is encouraging to see that such nature-focused interventions and approaches have increasingly been talked about in recent years and been framed as the concept called 'Nature-based Solutions' (NbS). NbS is essentially an umbrella concept covering wide range of ecosystem-based, people-centric activities, where the services we get from ecosystems are harnessed. It ranges from restoring a degraded forest to protecting a wetland to building green infrastructures for resolving waterlogging in our cities. NbS bring several ecosystem-based approaches together to offer us ranges of benefits such as food and water security, poverty alleviation, biodiversity conservation and mitigation of the impacts of climate change and disasters.

In 2015, all the United Nations Member States adopted the 17 Sustainable Development Goals (SDGs). These goals integrate economic development, social equity, and environmental protection, and are to be achieved by 2030.

NbS are key to achieving these SDGs, putting nature in the centre of our development approaches. For certain goals, we can see direct links between nature and climate action (SDG 13), biodiversity conservation, ecosystems protection (SDGs 14 & 15) or water management (SDG 6). For other SDGs, there is a moderate connection with nature. We can enhance our urban resilience (SDG 11) by blending built infrastructures with natural ones. Adopting NbS can also contribute towards enhancing community empowerment and ensuring gender equality (SDGs 1, 2 & 5). There are opportunities to incorporate nature-based approaches in the rest of the SDGs, for example, to promote sustainable production and consumption (SDG 12) and to achieve economic growth (SDG 8).

Leaders, policymakers, researchers, practitioners, and local communities need to work together to promote sustainable development for society by embracing nature. In recent years, nature and NbS are gathering momentum in global climate policy discourses and conservation-related dialogues. NbS also features in countries' national planning and actions. To have successful NbS on the ground, we must follow some basic principles, implement well-thought standards and protocols, and evaluate the effectiveness of interventions to design, implement, scale-up, and finance NbS by aligning our development with nature.

Rethinking Nature:

A Pathway towards Sustainable Development?

1. Why do we need nature to develop sustainably?

We are closely connected with nature and ecosystems. We depend on nature to meet all requirements for life – clean water and air, energy, livelihoods, food, and a stable climate. Many people, mostly from underdeveloped and developing countries, are engaged directly or indirectly in natural resource-dependent activities for their livelihoods and wellbeing. Our economic growth and development also largely depend on nature, and this dependency will not reduce in the near future. However, our economic, food and lifestyle activities are having dramatic and visibly detrimental effects on our nature and ecosystems. This not only threatens biodiversity and species, but also puts our own lives at risk. Our economic growth is being achieved at the cost of destroying nature.

If we look into our food system, the agricultural production for the world's population requires more than a third of the world's land surface and nearly 75% of freshwater resources.¹ With the growing population, the demand for food is set to rise. By 2050, the Food and Agriculture Organization of the United Nations (FAO) predicts that in sub-Saharan Africa and South Asia, agricultural output would need to be more than double, whereas in the rest of the world, the projected increase would be about one-third above the current level.² If we focus on the energy sector, our renewable energy system needs to be scaled

up to move towards the goals mentioned in the Paris Agreement on climate change – agreed in 2015 to limit the global temperature rise below 2°C. For that, energy efficiency needs to be expanded in all sectors.³

For more than thirty years when we have talked about our growth and well-being, we have been talking about 'sustainable development' as an approach to solve our economic, social and environmental problems and collectively to find new ways of organizing our economies and societies for the future. In 2015 all of the UN Member States adopted the Agenda 2030 which provides a framework of 17 Sustainable Development Goals (SDGs) to eradicate poverty, protect the planet, and ensure peace and prosperity for all.⁴ We have used up one-third of the time to achieve those Goals and their 169 targets. There has been some progress but many societal challenges are far from over, especially in the wake of COVID-19 pandemic.⁵

In the question of sustainability – we cannot separate nature from our development ventures, from our well-being. We must look for the solutions to our problems in nature. We can address our challenges not only by doing-no-harm to nature, but also by embracing it, learning from it, using it sensibly. It is encouraging to see that such nature-focused approaches and interventions have gained momentum as affordable and scalable solutions. These are called 'Nature-based Solutions' (NbS).

In this article, we will look into the obvious and potential relationships between nature and the SDGs using a nature-based solutions (NbS) lens. We will also explore how taking a nature-based pathway can bring about positive social, economic, and environmental outcomes and promote sustainable development for our society.

2. What are Nature-based Solutions (NbS)?

Nature-based Solutions (NbS) involve working with and enhancing nature to help address societal challenges. They benefit both humans and biodiversity. NbS is an umbrella concept covering a wide range of ecosystem-based, people-centric activities, where goods and services we get from the ecosystems are harnessed. NbS is seen as an integrated approach to promote synergies among the SDGs. From a benefit point of view, nature-based interventions are cost effective, easier to maintain than built infrastructures, and provide long-term and multiple benefits.^{6,7}

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The term NbS has been defined in several ways. The most widely used definition is by IUCN: “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”. While IUCN definition focuses more on ecosystems to address the leading societal challenges, there are other definitions, like that from the European Commission (EC), which are broader in scope and include actions that are inspired and supported by nature.⁸

2.1 How can NbS fight multiple societal challenges?

NbS in different ecosystems offer benefits and opportunities for people to tackle global risks and societal challenges, such as biodiversity loss, food and water insecurity, disaster risk, climate change, poverty, and health risk. To address these challenges, NbS bring together several approaches, including restoration, protection, conservation of ecosystems and harnessing their services.⁹ Figure 1 illustrates how NbS integrate different ecosystem-based approaches to address different societal challenges. By addressing those, NbS offer human well-being and biodiversity benefits.

Food insecurity is one of the major issues facing the world today. Through NbS, we can generate sustainable solutions to this challenge. By managing, restoring or conserving ecosystems, we can strengthen the production, availability, access and consumption of food during uncertainties, like natural disasters. In doing so, NbS welcome traditional and indigenous knowledge to address this. Floating agriculture from Bangladesh is an example. In this traditional practice in the southern wetlands of the country, water hyacinth and other plant materials are used to prepare

rafts on stagnant waters. Once the surface biodegrades, farmers raise seedlings there and grow vegetables and other crops during the monsoon months. This age-old ecosystem-based approach offers multiple socio-economic, agricultural, and ecological benefits. It ensures food security and it enhances nutritional securities by adapting the changing climate to promoting livelihood options and poverty alleviation of rural communities living near the coastal freshwater wetlands and riverine floodplains. As this traditional practice does not require much chemical fertilizers, it does not harm the wetland environment and biodiversity.¹⁰

To ensure food security, we need water to irrigate, which makes the agriculture sector the greatest consumer of water. It is projected that globally agricultural production can be boosted by a 20% increased average crop yield through practicing greener water management. This also reduces the use of insecticides and improves the soil coverage.¹¹

Infrastructural management, supply, and utilization of water make up a significant part of our water security. While embankments and dams do offer immense benefits in ensuring irrigation, energy supply, and flood protection, they also alter the natural flow of rivers harming aquatic habitats. Conserving wetlands facilitates water security in a natural manner. It is, however, true that nature alone cannot overcome water insecurity for all. A NbS approach promotes a mixed option in some cases, by blending ‘natural or green infrastructure’ and ‘built or grey infrastructure’ for managing water resources. With a growing demand, China’s ‘Sponge cities’ utilise a number of green solutions approaches, such as green roofs, pervious pavements, rain gardens, and restoration wetlands to improve water availability in urban neighborhoods.¹²

In terms of disaster risk reduction, natural or modified ecosystems, such as mangroves, forests, and wetlands, can reduce risks from



Figure 1: Nature-based Solutions (NbS) is an umbrella concept of ecosystem-related approaches to address a wide range of societal challenges such as climate change, food insecurity, water insecurity, disaster risks, health risks, and social and economic development. Source: Cohen-Shacham et al. (2016)

flooding, drought, landslides, heatwaves, and cyclones. These ecosystems not only protect lives and properties by acting as a 'buffer' during any natural hazards, they also support quick recovery of livelihood sources after an unavoidable hazard strikes a community. Services from ecosystems have led planners to consider ecosystem-based disaster risk reduction (Eco-DRR) approach. The Bhitarkanika Conservation Area in India showed that having mangroves on the coastal belt could help rice and other crops to recover from salinity intrusion much faster.¹³ The Sundarbans — the largest mangrove forest in the world covering parts of Bangladesh and India — serves as a coastal defence mechanism against storm surges¹⁴ and protected both countries from the latest Super Cyclone Amphan that hit the coast on 20 May 2020. A recent global study on flood protection benefits of mangroves ranked Vietnam, India, and Bangladesh as the top three countries receiving greatest benefits

Putting people in the centre of NbS approach requires understanding the local customs, traditions, and power dimensions.

in terms of people protected by mangroves from coastal flood events. The study also listed the USA, China, India, and Mexico as countries receiving the greatest economic benefits from this natural infrastructure called mangroves.¹⁵ Our well-being greatly depends on a healthy environment. Ecosystems can influence human health, mental peace, safety and security, and social bonding. Although the relationship between natural resources and well-being is complex, a recent study showed that the socio-ecological condition of a person's living environment is crucial for leading a satisfying life.¹⁶ People

living in a degraded system such as the saline shrimp-farming zones in the southwest region of Bangladesh, tend to report the lowest life satisfaction, compared with people living in the riverine area or living on the forest periphery. Research also shows levels of life satisfaction can be associated with cultural and aesthetic values of an ecosystem or landscape. Moreover, ecosystems like forests, coral reefs or other native species are considered as an important source of medicines.¹⁷ About 4 billion people depend on natural ecosystems — significantly contributing to their health and well-being.¹⁸

2.2 How people's participation is fundamental to NbS?

A participatory approach involving local communities in the decision-making process and implementation arrangement is fundamental to NbS. Putting people in the centre of NbS approach requires understanding the local customs, traditions, and power dimensions. Bangladesh has a long



Figure 2: Floating agriculture - a traditional practice, Pirojpur, Bangladesh. Source: Haseeb Md. Irfanullah

history of wetland management with local community. About 25 years back, most of the initiatives were essentially focused on participatory sustainable fisheries resource management. But, gradually such collaborative approach was channeled into biodiversity conservation and climate change adaptation.^{19,20} Through raising people's awareness, facilitating participatory planning processes, building the capacity of the community to lead and to manage activities, arranging saving and loan schemes, implementing natural resource management protocols, and establishing stronger links with the local government institutions, nationally and globally important wetlands, like Tanguar Haor, Hakaluki Haor, and Baikka Beel, have shown improved biodiversity and resource management, along with better social equity and community resilience.

In the Zarga River Basin in Jordan, the community was engaged in reducing poverty and conserving biodiversity by utilizing NbS to restore and manage dryland ecosystems.²¹ Through participatory community-based management, the community needs were integrated to secure the rights of private and common ecosystem services and to promote income generating activities for all communities. The government transferred the management rights to the communities by allocating lands in support of sustainable rangeland management and built capacity of the local community through awareness raising and skill development programs to identify the beneficial plants and to assess the land restoration. Similarly, in Sanzara, Uganda, participatory adaptation planning led to implement ecosystem-based actions, like restoration of micro-catchment of the River Sipi, enhancing food and water security for the climate vulnerable communities by empowering them.²²

3. Can we put nature in the centre to achieve SDGs?

A recent report by the United Nations upheld the dire situation of nature because of our rampant actions towards it.²³ Worldwide, the human population has more than doubled since 1970 showing a 15% increase in global per capita consumption of resources. As a result, we have significantly altered and degraded three-quarters of the land-based environment and about two-third of the marine

ecosystems. In addition, loss of wetlands is currently three times faster than the loss of forests. The urban areas are also expanding at an alarming rate to accommodate the growing population. In the next 10 years, urban areas are projected to be three times larger than around 2000, which indicates further encroachment of biodiversity-rich areas and a huge decline of many species. The extinction rate of plant and animal species is currently accelerating at a scale unknown to humans, putting about 12.5%



Figure 3: A new viewpoint proposed by SRC in rearranging different SDGs in relation to biosphere, society, and economy. Source: Stockholm Resilience Centre (SRC), 2017



Figure 4: Using the framework of SRC in Figure 3, the interconnection of NbS with all tiers is illustrated. Source: <https://www.youtube.com/watch?v=paVTJtgGFFU>

of 8 million world's species on the verge of extinction in the coming decades.²⁴ All these are essentially undermining our efforts towards achieving sustainable development. Putting it into perspective, in relation to the UN SDG framework, a recent assessment warned that if we continue our current consumption and behavior without further major shift in technology and attitude, the progress towards many of the relevant SDGs would be weakened.²⁵

While in the sustainability approach, we connect different dimensions of society, economy and environment, but in practice, we treat the SDGs separately. The Stockholm Resilience Centre (SRC) proposes a different viewpoint where all the SDGs are interconnected, as illustrated in Figure 3. The SDGs directly related to our economy and society are essentially built on the SDGs related to biosphere, in other words to ecosystems and nature.²⁶

As all the goals in Agenda 2030 are to address different societal, environmental, or economic challenges, we can address these goals, either directly or partly, by putting nature in the centre and applying the nature-based solutions and approaches. The University of Oxford has recently brought in relevant global research on a comprehensive knowledge platform under its 'Nature-Based Solutions Initiative (NbSI)' (www.naturebasedsolutionsinitiative.org). In one of its communications, it presented a diagram as shown in Figure 4. Prepared based on the SRC's framework (Figure 3), this sketch shows how NbS are linked with all the 17 SDGs, but with some more than the others. Each SDG tier connects to various ecosystem-based approaches differently — NbS has the potential to enhance our approach to all of them.

The Tier 1 deals with the SDGs which are very clearly connected to nature — water, terrestrial

and aquatic biodiversity, and climate change to be specific. A well-conserved wetland and its catchment area, for example, not only enhance aquatic and terrestrial biodiversity (SDG 15), but also ensure water security (SDG 6) of the local community as well as help them to adapt to the negative impacts of climate change (SDG 13) by offering stronger ecosystem services. But while discussing NbS, we should not restrict ourselves to these biosphere-related SDGs. If we look into other tiers individually, we would see more clearly how NbS is connected to remaining 13 SDGs.

If we focus on the SDGs in the Tire 2 (Figure 4), poverty and food security are two interlinked societal challenges and can be addressed through NbS. The communities living near the Abuan Watershed Protected Area in Isabela, the Philippines, for example, were facing climate change related threats with rising temperatures and erratic rainfall.²⁷ Having support from local governments and NGOs, communities co-created cohesive solutions by planting trees alongside crop and livestock rearing. They managed to restore the soil and water quality of the watershed, which helped them to enhance their crop production and ensure food security (SDG 2). Training built their capacity to learn better farming techniques. Their livelihoods also became resilient as they could sell fruits from their planted trees (SDG 1).

Examples of natural resource management from different parts of the world — be it women groups network in Nepal,²⁸ electoral system in community-based Ramsar site management in Bangladesh²⁹ or forest landscape restoration in the Philippines and Papua New Guinea³⁰ — showed how crucial societal challenges, like gender equality and women empowerment (SDG 5), could be address through practicing NbS. Nevertheless, integrating

gender equity in implementing NbS remains a challenge often strongly influenced by culture, norms, and traditions.³¹

Shifting to an urban context, blending the current expansion of urban areas with 'green infrastructure' can change the urban landscape significantly by improving the air quality, mitigating heat effect, reducing storm-water runoff and water pollution, and reducing urban noise pollution, contributing to urban resilience (SDG 11).³² Increasing the green and blue spaces with lakes and wetlands can play an important role to regulate the microclimate. Managing and restoring the urban waterbodies can enhance the water quality³³ as well as the water drainage system. It can improve property value and human life and well-being. In Shenzhen, a south-eastern coastal city of China, for example, the authority manages stormwater in the sports centre, which has green infrastructures, like a green roof and permeable pavement, and it can hold over 60% of the annual rainfall.³⁴ By protecting three watersheds since 1990, New York City has the largest unfiltered water supply in the USA. Every year, the most populous city of the country is saving more than US\$300 million on water treatment, maintenance, and other operational costs.³⁵

The SDG 8 from the Tire 3 (Figure 4), focuses on economic growth, which is currently Gross Domestic Product (GDP) driven, which is criticized for having a bias towards short-term financial gains than long-term human, social, and environmental costs. We cannot value the benefits we receive from natural environment to their fullest extent. Even if we conduct valuation for ecosystems, often times, non-economic value from nature is largely beyond our calculation. We need to value and appreciate all these non-measurable services we receive from nature, even though monitoring and

evaluation of these services are difficult, but it is required to have a sincere measure and tracking of sustainable progress.³⁶

To make the sustainable use of natural resources, new economic approaches and models are required. There has been a new approach called 'Beyond GDP' to track the economic progress supported by World Wildlife Fund (WWF) to promote green economy.³⁷ New Zealand is also adopting innovative approaches like 'Living Standard Framework' to look into the economic, social and environmental wellbeing and integrate in country's national budget to transform the economy, improve health and wellbeing, and support a productive nation.³⁸ Also, we need to transform our economies and infrastructures with pioneering framework like 'Sustainable Blue Economy approach' if it comes to protect the health of the ocean ecosystems. The approach has principles to promote sustainable benefit, protect and maintain the health of marine ecosystems and to adopt clean technologies and promote circular economy.³⁹ To integrate nature into measuring our growth and progress, we have to embrace NbS, either alone or in combination with grey solutions, where NbS show their limits, especially under changing climate.

The SDG 17 (Partnership for the Goals) highlights the fact that

interlinkage among the SDGs and their relationship with nature uphold the need for national, regional as well as global efforts to mainstream NbS in development discourses and actions. Strong evidence is still required to advocate for the scale-up of nature-based approaches. Additionally, implementation of NbS needs resources and finance. There is a need for strategic partnership among actors to mainstream NbS into decision-making to act on all the goals towards sustainable development. Multi-stakeholder collaboration would help ensure NbS becoming a part of policy and planning processes and formulate strategies to generate cost-effective measure to implement the goals keeping nature at the centre of development actions.⁴⁰ Bold commitments and actions are needed from all the governments and non-government actors of every nation to address nature and sustainable development through an integrated approach like NbS.

4. Where do we stand on NbS in policy discourse?

NbS has gained global momentum through UN Climate Summit 2019 as one of the key action tracks.⁴¹ Also, in the IPCC's Climate Change and Land Report,⁴² Global Commission on Adaptation Report⁴³ as well as global assessment on biodiversity report,⁴⁴ NbS are endorsed.

or national policy interventions to tackle emergencies, including climate change, biodiversity loss and the current pandemic, and also to enhance community resilience by upscaling the solutions through better finance and good governance.

4.1 How is NbS recognized in global climate talks and actions?

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) acknowledges the importance of ecosystems for climate change mitigation and adaptation. It mentions the importance of conservation to reduce the greenhouse gases and the role of ecosystems to protect biodiversity. To support the Paris Agreement, nations worldwide adopted their Nationally Determined Contributions (NDCs). A recent study⁴⁵ analyzed NbS integration in the NDCs showed that 66% of 168 Paris Agreement signatory countries expressed interest in working with NbS, either including them in adaptation or mitigation or in both components. In 2020, these climate pledges are being revised and it would require the researchers to work closely with the practitioners and policy-makers to identify revised NDC targets for the benefit of the society and nature. We should remember that protection and restoration of ecosystems are better than planting miles and miles of trees and promoting single species afforestation. NbS do not promote monoculture or

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