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# Creating biodiversity safeguards for nature-based solutions for climate change mitigation and adaptation

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## Abstract

There have been many trials and pilot experiments to mainstream biodiversity into the climate change regime through initiatives like REDD+ and Ecosystem based approaches. Nature-based Solutions (NbS) are being viewed as yet another opportunity to synergize climate and biodiversity actions. However, NbS is being promoted more as a climate solution than a biodiversity solution, while the word “nature” makes it seem like it may be good also for biodiversity. Past experiences show that not all forest-based projects conserved biodiversity, while some turned out to be harmful due to their “mitigation centric” approach. Carbon sequestration by ecosystems is just a part of the overall services it provides, which include a range of provisioning, supporting, regulating and cultural services. All these are not accounted for when we focus on mitigation. This has led to a fear among the conservation community whether these solutions actually focus on biodiversity or just climate. It is important that NbS considers the overall value of nature beyond its carbon sink capability. Therefore, the socio-ecological systems mechanism needs to be well studied, both through the biodiversity and climate lens, to keep proper safety nets for biodiversity and dependent communities. In this background, this paper discusses: (i) trade-offs associated with former forest-based mechanisms under the climate regime; (ii) path shown by different organizations and researchers for the implementation of NbS; and (iii) ways to introduce biodiversity safeguards for NbS, considering social-ecological interactions. NbS is seen as a broad-spectrum solution and must advocate biodiversity conservation and sustainable development. NbS is taking an important position in both CBD and UNFCCC negotiations and future COPs will be instrumental in deciding the guidelines for NbS. This paper will add to the ongoing debate also using the available literature on NbS since its inception.

*Keywords: Nature; CBD; UNFCCC; forest-based mitigation; safeguards; biodiversity; community*

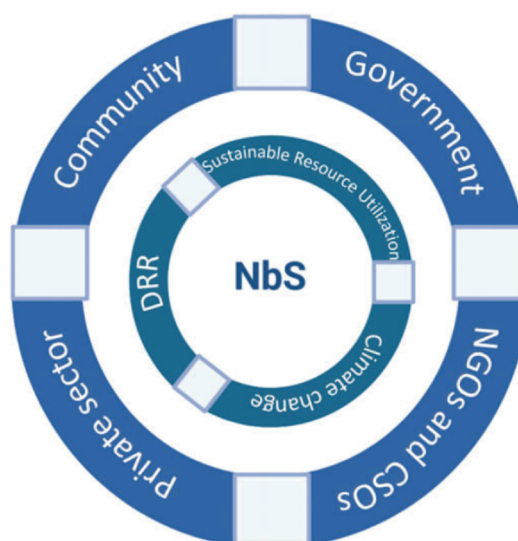
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## Introduction, scope and main objectives

The Nature based solutions (NbS) have started to gain more relevance and weight at various international forums, including at the United Nations Framework Convention on Climate Change (UNFCCC) and Convention on Biological Diversity (CBD). This is increasingly worrying the international biodiversity community as to what impacts it could have on biodiversity conservation efforts in the long run. This paper is driven by that concern and aims at suggesting ways to create safeguards, reflecting on the history of biodiversity coverage in the UNFCCC negotiations and how it conflicted with the biodiversity goals.

Overtime, it is recognised that land and water are important links between biodiversity and climate change, and effectively managed natural areas make us less vulnerable to the changing climate. Such management can also potentially reduce the risk and exposure to the communities. The world has started to contemplate options that allow and assist nature to heal itself for sustenance of nature's benefits to the society (Gupta and Dube 2021). Probably, this is the main reason behind bringing forth the Ecosystem-based Adaptation

(Secretariat of CBD 2009; UNFCCC 2017) to effectively adapt to the adverse effects of climate change while strengthening the community and ecosystem resilience of communities and ecosystems. NbS includes the aforementioned in addition to disaster risk reduction and engaging a wide range of stakeholders from the government, community, private sector and non-governmental organisations (Figure 1).



**Fig. 1:** Multiple stakeholders and benefits approach of the NbS (Gupta & Dube, 2021).

NbS is deemed to have multiple benefits, but only if it is implemented in a proper manner. If NbS is promoted more as a climate solution than a biodiversity solution, it may impact biodiversity negatively. Past experiences show that not all “nature” or land-based projects conserved biodiversity, while some turned out to be harmful due to their “mitigation centric” approach. Carbon

sequestration by ecosystems is just a part of the overall services it provides, which include a range of provisioning, supporting, regulating and cultural services. All these are not accounted for when we focus on mitigation. Therefore, in addition to equally focusing on adaptation, it is important to keep proper safety nets for biodiversity and dependent communities when the NbS is implemented on the ground. To establish the need for such safety nets, the upcoming sections discuss the trade-offs associated with former forest-based mechanisms under the climate regime, and learnings for effective implementation of NbS with safeguards. The latter part establishes the need for the introduction of biodiversity and community safeguards for NbS, considering research and current debate on NbS. It is seen as a broad-spectrum solution and must advocate biodiversity conservation and sustainable development. NbS is taking an important position in both CBD and UNFCCC negotiations and future COPs will be instrumental in deciding the guidelines for NbS. This paper will add to the ongoing debate using also the available literature on NbS since its inception.

## Biodiversity and Forests under UNFCCC

It is highly recognised that biodiversity conservation is central to climate change adaptation and mitigation. The UNFCCC Conference of the Parties (COP) decisions on biodiversity started at COP 6 through the Bonn Agreements (Table 1), when LULUCF was first recognised as an important carbon sink, and Afforestation/Reforestation projects under the Clean Development Mechanism (CDM) of the Kyoto Protocol were given a go ahead. Eventually, that became one of the most celebrated land-based activity for climate action and adaptation. Most COP decisions later that linked climate and biodiversity focused on forestry as a sink, while REDD (Reducing Emissions from Deforestation and Forest Degradation), that came up in Bali, was recognised to also have co-benefits. Developing countries, including India, played an important role in bringing in conservation in REDD to make it REDD+.

**Table 1:** Decisions linked to forests and biodiversity under UNFCCC

COPs	Decisions on biodiversity
COP 6	<b>Bonn Agreements:</b> Affirms the principles of LULUCF contribute to the conservation of biodiversity and sustainable use of natural resources.

	Requests the SBSTA to develop definitions and modalities for including A/R projects under the CDM, including impacts on biodiversity and natural ecosystems.
<b>COP 7</b>	<b>Decision 11/CP.7:</b> Requests the SBSTA to develop definitions and modalities for including A/R project activities under Article 12 in the first commitment period, taking into account impacts on biodiversity and natural ecosystems, among others. <b>Decision 5/CMP.1:</b> The implementation of land use, land-use change and forestry activities should contribute to the conservation of biodiversity and sustainable use of natural resources.
<b>COP 8</b>	<b>Decision 1/CP.8:</b> Calls for national sustainable development strategies integrating more fully climate change objectives in key areas such as water, energy, health, agriculture and biodiversity.
<b>COP 9</b>	<b>Decision 19/CP.9:</b> Takes into account the impacts of A/R CDM projects on biodiversity and natural ecosystems. The PDDs should include analysis of the environmental impacts, including impacts on biodiversity and natural ecosystems.
<b>COP 13</b>	<b>Decision 2/CP.13:</b> Recognises that REDD can promote co-benefits and may complement the aims and objectives of other relevant international conventions and agreements. Demonstration activities should be consistent with sustainable forest management, noting the relevant provisions of the UNFF, the UNCCD and the CBD.
<b>COP 15</b>	<b>Decision 4/CP.15:</b> Recognises the importance of promoting sustainable management of forests, including biodiversity, that may complement the aims and objectives of national forest programmes and relevant international conventions and agreements.
<b>COP 16</b>	<b>Decision 1/CP.16:</b> The REDD+ actions must be consistent with the conservation of natural forests and biological diversity. Encourages developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (paragraph 70).
<b>COP 17</b>	<b>Decision 2/CP.17:</b> REDD+ should promote poverty alleviation, biodiversity benefits, ecosystem resilience, and the linkages between adaptation and mitigation.
<b>COP 19</b>	<b>Decision 11/CP.19:</b> Modalities for national forest monitoring systems <b>Decision 15/CP.19:</b> Addressing the drivers of deforestation and forest degradation.
<b>COP 20</b>	<b>Decision 1/CP.20:</b> All Parties to take into account joint mitigation and adaptation approaches for the integral and sustainable management of forests (mitigation-oriented) & Recognize the importance of greenhouse gas emissions by sources and removals by sinks resulting from landuse change and forestry activities for understanding mitigation contributions.
<b>COP 21</b>	<b>Decision 1/CP.21:</b> Notes the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth. (Paris Agreement) Parties should take action to conserve and enhance, as appropriate, sinks and reservoirs of greenhouse gases as referred to in Article 4, paragraph 1(d), of the Convention, including forests. (Paris Agreement) Recognizes the importance of adequate and predictable financial resources, including for results-based payments, as appropriate, for the implementation of policy approaches and positive incentives for reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. (Para 54)
<b>COP 23</b>	<b>Decision 7/CP.23:</b> the Standing Committee on Finance will integrate financing for forest-related considerations into its 2018 workplan
<b>COP 26</b>	<b>Draft Decision CMA.3:</b> Emphasizes the importance of protecting, conserving and restoring nature and ecosystems to achieve the Paris Agreement temperature goal,

	including through forests and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by protecting biodiversity, while ensuring social and environmental safeguards
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COP 26 tried to bring more focus towards biodiversity, especially on its integration into climate action planning at the national levels. It highlighted, during discussions, that land and water are important links between biodiversity and climate. Effectively managed natural areas make us less vulnerable to climate change, reducing the risk and exposure. Although this received a fair response from the Parties, nature was not 100% accepted as a solution to climate change, as it is a “victim” of climate change, and cannot be treated as just “recipient” of carbon.<sup>1</sup> Certain side-events saw strong comments on the inclusion of appropriate safeguards for the local communities and nature if these were to be implemented. This exhibits the fear in the minds of many stakeholders.

### **Forestry-based mechanisms: Trade-offs for biodiversity and community**

Table 1 clearly shows the inclination of UNFCCC decisions and thus, the Parties, towards forests as relevant sinks, instead of the whole set of ecosystem services it provides. However since the Paris Agreement emphasis is given to biodiversity protection as well. But it looks more a rhetoric than reality, unless its implementation is seen on the ground. For example, the CDM afforestation/reforestation (A/R) projects focused mainly on carbon sequestration and lack disincentives for destruction of biodiversity, mainly as the decisions of COP were inclined towards carbon sequestration. Therefore, CDM-related carbon sequestration initiatives relied more on the use of fast-growing plant species for fast carbon uptake, but ecosystem degradation (Díaz et al. 2009). There was little attention on the role ecosystem-based approaches (Cowan et al. 2009). Forest carbon projects that ignore social or biodiversity impacts are likely to have higher leakage and non-permanence risks (Pilgrim et al. 2011).

One such example was the private sector CDM forestry projects in India, which were found to be damaging to the biodiversity hurting the adaptive capacity of local communities since their main objective is to acquire industrial raw materials by planting monocultures while earning carbon offset funds on the side. Public sector and NGO projects in India were, on the other hand, found to be biodiversity-friendly as their primary objective was to benefit the local communities by planting multiple indigenous fruit, fodder and firewood species. Projects in Brazil were found to have similar dynamics as private sector projects in India, and the projects in China were more like Indian public sector and NGO projects (Gupta 2015).

The A/R CDM gave several lessons. These include lack of biodiversity safeguards; lack of social safeguards; lack of detail in socio-economic assessments; promotion of potentially damaging afforestation and reforestation activities; lack incentives to stop or slow down deforestation; skipping the concept of adaptation; lack of synergies with other related conventions like CBD; and chances of double counting, leakage and non-permanence (Gupta and Dube 2018).

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## **Path towards effective and safe implementation of NbS**

The European Commission organised a workshop on mobilizing up-scaling of Nature-based Solutions for climate change throughout 2020 and beyond in February 2020. It noted that there is unprecedented political momentum and window of opportunity for scaling up NbS with the changing narrative from ‘nature or people’ to ‘nature and people’. However, its uptake requires more clarity and standardization. It suggested action on two fronts: creating an enabling environment to scale up existing initiatives and projects; and, developing a strategic vision and global movement for NbS (European Commission 2020). The commission also defined NbS as solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide

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<sup>1</sup> Personal observation during UNFCCC COP-26 in Glasgow, UK.

environmental, social and economic benefits and help build resilience (EU 2020). This shows that countries are looking forward to a holistic implementation of NbS that provides multiple benefits.

The University of Oxford also organized NbS Digital Dialogues in July 2020. It stressed that biodiversity is essential for restoring and managing resilient landscapes. However, it said, that there is lack of investment in selecting suitable tree species for afforestation and reforestation. Therefore, future effects of climate change on NbS ecosystems need to be factored into NbS planning, and biodiversity indicators are needed to measure and monitor the success of NbS, requiring a landscape approach to management (University of Oxford 2020).

At COP 26, the World Bank talked about mainstreaming of biodiversity, mentioning that low income countries could lose 10% of GDP every year due to loss of biodiversity. Climate change is a critical driver of biodiversity loss, putting 160 million ha of marine and coastal protected areas and 10 million ha of terrestrial area at risk. The United Nations Convention on Combating Desertification stressed on land restoration as a means of combating climate change and conserving biodiversity. Discussions were inclined on the integrated actions on climate change and biodiversity. Countries are already trying to link CBD targets with UNFCCC goals. About 60% of countries identify biodiversity as an adaptation priority. In the NDCs received in 2021, this has risen to 75%. It is comparable to agriculture, health and water resources.<sup>2</sup>

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## The safeguard approach

Green infrastructure can help meet several goals across sectors and may also be cost-effective, healthy and sustainable (Kabisch et al. 2016). Ma et al. (2014) suggest natural regeneration of forests instead of carbon monoculture solutions, and integration of ecological restoration into climate approaches. Ecosystem-based adaptation which yielded much better results than A/R may be used as a learning for creating safeguards for NbS. Such learnings include adaptive transition, leading to sustainability (Scarano 2017; Reid et al. 2018).

To implement NbS effectively with appropriate safeguards, it is important to combine qualitative aspects with quantitative targets that concern the community and various ecosystems services reflecting on the “nature-human” harmony. Increase in forest cover must be seen in light of biodiversity targets being achieved. Many countries are working towards such integration. The key is to define broader initiatives and goals that can show the way towards transformation beyond carbon sequestration.

IUCN provides a criteria for self-assessment that relies on balancing trade-offs, inclusive governance, biodiversity net gain, adaptive management, mainstreaming and sustainability (IUCN 2019). Such criteria assessed using both quantitative and qualitative approaches can be helpful in providing multiple benefits, in addition to reducing loss and damage associated with climate change. UNEP adaptation gap report (UNEP 2021) finds that NbS are a source of investment with the potential to reduce climate risks and vulnerability, while providing economic, environmental, and social inclusion. Infact, COVID-19 recovery stimulus packages also provide an opportunity for green and resilient recoveries. There is significant focus on ecosystems restoration. This is likely to push new finance towards nature recovery, instead of pure carbon sinks of fast growing species.

What is needed is a balance that is somewhere between a completely protected area system that bars local community interference completely, and a monoculture that destroys biodiversity. NbS must provide strength to the indigenous and local communities, unlike most other solutions that further stress local livelihoods or threaten their dependence on nature. There is a need to work together to stop deforestation, protect ecosystems to improve resilience to climatic changes. Restoration is the key to achieve that, guided by NbS that focus on broader set of goals.

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<sup>2</sup> Personal observations during UNFCCC COP-26 in Glasgow, UK.

In addition, NbS must be recognised more like a joint mitigation and adaptation approach including sustainable food production and forest management, in the context of climate change. UNFCCC must also now align equally with the post-2020 Global Biodiversity Framework, and Sustainable Development Goals. COP 26 did not produce a solid outcome on NbS, however, there is hope from the concurrent discussions that upcoming COPs will be more thoughtful of such actions, in light of other needs, including that of indigenous peoples and need for disaster risk reduction. A harmonized definition of NbS in the context of major multilateral environmental agreements must be considered so as to streamline action.

Biodiversity needs to be integrated properly in UNFCCC decisions that includes modalities and provisions for community-based and ecosystem-based adaptation. Its inclusion in both market and non-market mechanisms, must come with an approach which is beyond just safeguarding but rather enhancing biodiversity and community resilience. This will also facilitate inclusion of, and mainstreaming biodiversity in national adaptation planning processes.

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## Conclusions

The UNFCCC decisions so far make clear the inclination towards more “sink” inclined activities, although biodiversity has started to figure in recently in the climate debate. Various organisations have put forth the need to factor in the relevant safeguards for NbS. However, this in effect, will be implemented only if UNFCCC considers the safeguard approach that goes beyond just conserving biodiversity or maintaining environmental integrity, which was also a part of CDM. Although CDM never incentivised biodiversity destruction, it did not also provide disincentives to not do so. This time, forest based mechanisms or solutions should include safeguards in addition to indicators that align with the post-2020 global biodiversity framework of the CBD, to facilitate implementation of a holistic NbS. The lessons include: lack of social and biodiversity safeguards, lack of detail in socio-economic assessments, promotion of monocultures; lack incentives to stop or slow down deforestation; and skipping the concept of adaptation. The safeguards for NbS must include: ecosystem services accounting, biodiversity enhancement indicators, livelihoods enhancement indicators, adaptation focus, resilience against loss and damage, and inclusive governance.

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