Climate Action Network

Briefing: The Role of Ecosystems and Biodiversity for Climate Change Mitigation Ambition and Adaptation & Resilience

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Climate Action Network (CAN) is the world's largest network of civil society organizations working together to promote government action to address the climate crisis, with more than 1500 members in over 130 countries.
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1. THE CHALLENGE: Tackling multiple, interlinked global crises

People around the world are facing a compounding array of social and environmental crises: devastating climate impacts, biodiversity loss, widening inequalities, and now of course the COVID-19 health crisis. Tackling these threats separately, as has been the case in the past, is jeopardising our ability to prevent dangerous climate change, ecological collapse, eradicate poverty and to reduce the risk of future global pandemics. In this briefing we set out the transformational role that protecting and investing in natural ecosystems can play in tackling these challenges.

The science

Research from major global bodies is clear: our planet is approaching dangerous tipping points. It also underlines that the climate, biodiversity and inequality crises are deeply interlinked and need to be tackled together.

- **IPCC warns: If we want to limit global warming to 1.5ºC, an urgent phase out of fossil fuel emissions and reductions in other greenhouse gases (GHG) needs to be combined with a large-scale uptake and storage of CO_2 from the atmosphere to reach net-zero emissions by 2050**[1]**.** If climate mitigation remains weak up to 2030, the 1.5ºC goal could then only be reached by deploying Carbon Dioxide Removal (CDR) measures up to 2050 – including afforestation and bioenergy with carbon capture and storage (BECCS) – at a very large-scale, severely compromising biodiversity and food security.[2] Hence protecting, restoring and better managing natural ecosystems on land and at sea - such as forests, grasslands, peatlands, seabeds, sea grass, kelp beds and wetlands - is essential to avoid the release of ecosystem carbon stocks and ensure they act as sinks, rather than sources of carbon[3]. Biodiverse ecosystems are also more resilient, including to climate impacts[4] and thus

[1] shorter alternative if better: IPCC (2018) Global warming of 1.5 C. An IPCC Special Report on the impacts of global warming of 1. Masson-Delmotte, Valérie, et al. ": 1-9.

[2] i.e. one IPCC 1.5ºC scenario projects bioenergy crops to be needed in an area the size of Australia. See the 'P4' illustrative 1.5ºC emissions reduction scenario in the IPCC (2018) 1.5ºC Special Report Summary for Policymakers, available at: https://www.ipcc.ch/sr15/chapter/spm/

[3] IPCC (2019) Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press

[4] Ibid

play a hugely important role in adaptation, increasing the resilience of communities across different scales and landscapes[5].

- **IPBES says: Transformative change is required to save nature and the planet: meaning fundamental, system-wide reorganisation across technological, economic and social factors, including paradigms, goals and values[6].** IPBES calls biodiversity humanity's most vital 'safety net', but with around 1 million species at risk of extinction, that safety net is close to the point of breaking, just when humanity needs it most. Climate change is one of the greatest drivers of biodiversity loss, and accentuates ecosystem degradation, thus perpetuating a dangerous feedback loop of GHG emissions compromising the world's ability to meet the goals of the Paris Agreement. The IPBES also projects that bioenergy crops would be planted in monocultures, further negatively impacting biodiversity.[7]

- **IPCC/IPBES Joint Working Group says: The climate and biodiversity crises threaten nature, human lives, livelihoods and well-being around the world and they must be tackled together.** This group underlines that climate change is threatening nature and people e.g. less food and drinking water; while biodiversity loss is affecting climate change through losses in carbon sequestration and impacts on nitrogen and water cycles. Solutions are still achievable but will require transformative change with rapid and far-reaching actions of a type never before attempted. Avoiding trade-offs will entail a profound collective shift of individual and shared values concerning nature – such as moving away from the conception of economic progress based solely on GDP growth, to one that balances human development with multiple values of nature for a good quality of life, while not overshooting biophysical and social limits. Narrowly-focused actions to combat climate change can directly and indirectly harm nature and vice-versa, but many measures exist that can make significant positive contributions in both areas. To achieve these solutions, we need to address the lack of effective governance systems and mechanisms to improve integration between solutions for climate change and biodiversity.

- **The UN says: Poor, vulnerable and marginalized communities are taking the largest toll from the impacts of climate change.** The UN's World Economic and Social Survey of 2016[8] finds that the differential effects of climate change on people and communities is largely due to the prevalence of multiple inequalities, in terms of access to resources and opportunities. The global climate and ecological crises exacerbate deeply-rooted inequalities, poverty and social injustices[9].

The evidence on the ground

2020 was filled with devastating examples of ecological and climate breakdown, triggered in part by humanity's broken relationship with the natural world. 2020 was another hottest year

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[5] Ibid

[6] IPBES (2018) Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating' [press release]. Available at: https://ipbes.net/news/Media-Release-Global-Assessment

[7] IPBES (2019) Global assessment report on biodiversity and ecosystem services. Available at: https://ipbes.net/global-assessment

[8] Department of Economic and Social Affairs (2016) World Economic and Social Survey 2016: Climate Change Resilience: an Opportunity for Reducing Inequalities. UN. Available at: https://www.un.org/development/desa/dpad/publication/world-economic-and-social-survey-2016-climate-change-resilience-an-opportunity-for-reducing-inequalities/

[9] Bond UK (2019) Addressing the Triple Emergency: Poverty, Climate Change, and Environmental Degradation. Available at: https://www.bond.org.uk/news/2020/06/the-triple-emergency-environmental-degradation-climate-change-and-poverty

on record[10], and saw the most active Atlantic hurricane season on the charts[11]. Over 50 million people were affected by floods, droughts and storms[12], and forest fires raged across the world[13] resulting in the death of more than one billion native animals in Australia alone[14]. Underlining it all, the Covid-19 pandemic revealed the extent of the damage that can arise from the destruction of nature; strong evidence suggests that unsustainable environmental exploitation – especially deforestation and habitat degradation – increases the risk of zoonotic diseases making the jump from animals to humans[15],[16].

The bottom line:

Bringing down emissions drastically and protecting natural ecosystems now is the safest way to reach the 1.5ºC goal and net-zero emissions by 2050 *while at the same time ensuring nature conservation now and throughout coming decades*. Indeed, the IPCC and IPBES indicates that **large-scale deployment of land-based CDR would likely severely compromise nature conservation**; —**half of the best bioenergy production areas are situated in biodiversity hotspots**, primarily in the tropics[17],[18].

2. A SOLUTION: the role of ecosystems and Indigenous stewardship in addressing multiple global challenges

Natural ecosystems are a vital part of the solution to the climate, ecological, and social inequality crises. Healthy ecosystems also lower the risk of zoonotic diseases making the jump from animals to humans. With appropriate social and environmental safeguards (see Annex 1), actions to **protect, restore and sustainably manage nature while allowing for indigenous and community-based ecosystem management** can help both to mitigate warming and to maintain and enhance social and ecological resilience. Indigenous Peoples and Local Communities (IPLCs) play a central role in mitigating both the biodiversity and climate crises: research shows that where they have secure land tenure, levels of biological diversity and carbon storage are higher[19].

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[10] NASA (2021) 2020 Tied for Warmest Year on Record, NASA Analysis Shows [press release]. Available at: https://www.nasa.gov/press-release/2020-tied-for-warmest-year-on-record-nasa-analysis-shows

[11] NOAA (2020) Record-breaking Atlantic hurricane season draws to an end [media release]. Available at: https://www.noaa.gov/media-release/record-breaking-atlantic-hurricane-season-draws-to-end

[12] Global Centre on Adaptation (2020) State and Trends in Adaptation Report 2020. Available at: https://www.cas2021.com/press/documents/reports/2021/01/22/state-and-trends-in-adaptation-report-2020

[13] WWF, BCG (2020) Fire, forest and the Future: a crisis raging out of control? Available at: https://wwfeu.awsassets.panda.org/downloads/wwf_fires_forests_and_the_future_report.pdf

[14] Anadolu Agency (2020) Wildlife loss in Australia much bigger than it appears. Available at: https://www.aa.com.tr/en/environment/wildlife-loss-in-australia-much-bigger-than-it-appears/1704885#:~:text=%22The%20fires%20have%20burnt%208.5

[15] IPBES (2020) Workshop Report on Biodiversity and Pandemics of the Intergovernmental Platform on Biodiversity and Ecosystem Services. Available at: https://ipbes.net/sites/default/files/2020-12/IPBES%20Workshop%20on%20Biodiversity%20and%20Pandemics%20Report_0.pdf

[16] Faust, C. L., et al. (2018) Pathogen spillover during land conversion. Ecology Letters, 21(4), 471– 483. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/ele.12904

[17] Santangeli, A., et al. (2012) Synergies and trade-offs between renewable energy expansion and biodiversity conservation - a cross-national multifactor analysis.*Global Change Biology. Bioenergy* 8.6 (2016): 1191-200. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/gcbb.12337

[18] Central America, Southwestern South America, tropical Africa and South East Asia some key areas at most risk for bioenergy conversion another threats (non-bioenergy conversion, and climate change). See: Hof, C. et al. (2018) Bioenergy Cropland Expansion May Offset Positive Effects of Climate Change Mitigation for Global Vertebrate Diversity. *Proceedings of the National Academy of Sciences - PNAS* 115.52 (2018): 13294-3299. Available at: https://www.pnas.org/content/115/52/13294

[19] Stevens, S. (2014) *Indigenous Peoples, National Parks, and Protected Areas*. Tucson: University of Arizona. Available at: https://www.jstor.org/stable/j.ctt183pbn5 ; Schuster, R. G, Ryan R, Bennett, J. R. et al. (2019),

To conserve nature's integrity now and into the future, **fossil-fuel phase out** and economy-wide emissions reductions must be urgently conducted in parallel to protecting, restoring and sustainably managing nature. This is required in order to avoid the need for Parties to rely in future decades on large-scale CDR such as BECCS in the name of reaching the 1.5ºC goal. There is also a key need to avoid 'false solutions' today such as bioenergy from wood biomass, which political leaders currently view as a climate 'solution' despite the severe warnings by over 500 scientists that they undermine climate and biodiversity goals including net-zero emissions.[20]

Ecosystems and climate change mitigation

Reaching the Paris Agreement temperature goal requires minimizing the carbon stock in the atmosphere by rapidly reducing emissions from fossil-fuels and resource use and maximising carbon stocks in the biosphere. Natural ecosystems play two major, distinct roles in climate change mitigation by **sequestering** atmospheric carbon through photosynthesis and **storing** it in biomass and soils. **The stability and longevity of the large carbon reservoirs in the biosphere is critically dependent on biodiversity, which provides ecosystems with their resilience and adaptive capacity.**

- **Carbon storage:** The main mitigation value of natural land and ocean ecosystems resides in the maintenance of their accumulated carbon stocks. The conversion and degradation of terrestrial ecosystems contributes up to 5.5 billion tons of CO_2e emissions into the atmosphere each year[21]- a volume similar to the global emissions of all road vehicles annually[22], whilst the trawling of the global ocean each year is estimated to release 1.47 billion tonnes of aqueous CO_2 emissions annually, a volume similar to the global aviation industry[23]. **Halting biodiversity loss and avoiding further emissions through the protection of remaining high-carbon ecosystems is the most effective, important and urgent nature-based mitigation strategy.**

- **Sequestration:** Historically, the land and ocean sinks have absorbed about one-half of human-generated CO_2 emissions[24]. However, these important sinks are rapidly becoming saturated as fossil-fuel emissions continue to climb, and ongoing loss and degradation of nature is further compromising their capacity to take-up anthropogenic carbon. **It is therefore vital that ecosystems on land and at sea are protected, restored and managed sustainably to ensure they act as sinks, rather than sources, of carbon.** A much-cited estimate is that nature and ecosystems can provide around 30% of the cost-effective solution needed for a >66% chance of keeping warming well below 2ºC by 2030 (Griscom et al. 2017[25], 2019[26]). However, crucial to acknowledge is that **achieving this absolutely depends on rapid decarbonisation action by phasing out fossil-fuels**, as the carbon balance of many ecosystems will

Vertebrate Biodiversity on Indigenous-managed Lands in Australia, Brazil, and Canada Equals That in Protected Areas. *Environmental Science & Policy* 101 (2019): 1-6. Available at: https://www.rcinet.ca/en/wp-content/uploads/sites/3/2019/07/Schuster-et-al-Indigenous-lands.pdf

[20] Woodwell Climate Research Center (2021) Letter Regarding Use of Forests for Bioenergy. Available at: https://www.woodwellclimate.org/letter-regarding-use-of-forests-for-bioenergy/

[21] IPCC (2020) Special Report on Climate Change and Land. Available at: https://www.ipcc.ch/srccl/

[22] IEA (2019) Transport sector CO_2 emissions by mode in the Sustainable Development Scenario, 2000-2030, IEA, Paris. Available at:https://www.iea.org/data-and-statistics/charts/transport-sector-co2-emissions-by-mode-in-the-sustainable-development-scenario-2000-2030

[23] Sala, E., et al. (2021) Protecting the global ocean for biodiversity, food and climate. Nature 592, 397–402. Available at: https://www.nature.com/articles/s41586-021-03371-z

[24] Friedlingstein P., et al. (2020) Global Carbon Budget. Earth System Science Data, 12, 3269–3340. Available at: https://www.globalcarbonproject.org/carbonbudget/20/publications.htm

[25] Griscom, B. W., et al. (2017) Natural Climate Solutions." *Proceedings of the National Academy of Sciences - PNAS* 114.44: 11645-1650. Available at: https://www.pnas.org/content/114/44/11645

[26] Griscom, B. W., et al. (2019) We Need Both Natural and Energy Solutions to Stabilize Our Climate." *Global Change Biology* 25.6 (2019): 1889-890. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.14612

likely be adversely affected if temperatures reach beyond 1.5ºC. At the same time, carbon uptake by ecosystems essentially replaces the amount of carbon depleted from the biosphere by human activities in the past[27].

If scaled up, and carried out alongside rapid fossil-fuel phase out, actions to protect, restore and sustainably manage nature with a right-based approach can make an important contribution to mitigating climate change this century[28]. However, in order for those mitigation benefits to materialise in later years, these **actions (such as restoration) need to be carried out without further delay, given that in natural ecosystems, sequestration and storage take place over a long period of time.**

Ecosystems and adaptation

Healthy ecosystems play a vital role in both reducing the vulnerability of societies to environmental shocks caused by climate change, and in increasing the resilience of the ecological system[29]. Ecosystem-based adaptation (EbA) defined by the Convention on Biological Diversity (CBD) as "the use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change"[30] can help maintain and increase resilience and reduce vulnerability of ecosystems and people to climate impacts, as part of an overall adaptation and development strategy. For example, EbA helps to reduce exposure to the impacts of climate change (e.g. restoring and protecting our coastal ecosystems helps to defend against flooding) and through participatory and rights-based approaches, actions working with nature can help to build adaptive capacity of local communities[31]. Crucially, natural ecosystems underpin the existence of all people through the provision of basic needs, including food and water, especially essential for the world's most marginalized populations - including people living in poverty, rural communities and Indigenous Peoples - who rely deeply on nature for their resources and livelihoods.

Ecosystems, global health and prosperity

The coronavirus global health crisis poses a major challenge but also an **unprecedented opportunity to introduce policies and actions that accelerate the shift towards a just and green transition**, through embedding nature more explicitly into our systems, especially given the links that have been drawn between the degradation of nature and pandemic risk. There are key opportunities to strengthen the enforcement of environmental regulations, which better legislate for and implement biodiversity and ecosystem protection, and more generally better recognise the role of nature in creating a more healthy and resilient future. The Dasgupta Review[32] made it clear that a truly prosperous and resilient future for all depends on transforming our economic systems to embed and appropriately value nature. Now more than ever, as the world rebuilds, it is clear that decisions made today will shape our societies and

[27] Mackey, B., et al. (2013) Untangling the confusion around land carbon science and climate change mitigation policy, *Nature Climate Change* 3: 552-557. Available at: https://www.nature.com/articles/nclimate1804

[28] Girardin, C., et al. (2021) Nature-based Solutions Can Help Cool the Planet - If We Act Now. *Nature (London)* 593.7858: 191-94. Available at: https://www.nature.com/articles/d41586-021-01241-2

[29] Barber, C.V., et al. (2020). The Nexus Report: Nature Based Solutions to the Biodiversity and Climate Crisis. F20 Foundations, Campaign for Nature and SEE Foundation. Available at: https://www.foundations-20.org/wp-content/uploads/2020/11/The-Nexus-Report.pdf

[30] Convention of Biological Diversity (2009) Connecting biodiversity and climate change mitigation and adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Technical Series No. 41. Secretariat of the CBD, Montreal. Available at: http://www.cbd.int/doc/publications/cbd-ts-41-en.pdf

[31] Seddon, N., et al. (2020) Global Recognition of the Importance of Nature-based Solutions to the Impacts of Climate Change. *Global Sustainability* 3 Global Sustainability, Vol.3. Available at:https://www.cambridge.org/core/journals/global-sustainability/article/global-recognition-of-the-importance-of-naturebased-solutions-to-the-impacts-of-climate-change/31E756CC7792FB9DF717E3DAEE1381AC

[32] Dasgupta, P. (2021) The Economics of Biodiversity: The Dasgupta Review. Abridged Version. (London: HM Treasury). Available at: https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review

economies for decades to come. In this context, it becomes crucial to ensure that the climate and nature agendas move forward together with the breadth and urgency required.

The bottom line:

By effectively deploying solutions through nature, we can protect and enhance carbon stocks and sinks in line with Article 5 of the Paris Agreement, and also improve adaptation and resilience towards climate change in line with Article 7.2 of the Paris Agreement. Crucially, appropriately safeguarded actions to support, protect, restore and better manage nature - such as the conservation of primary and intact ecosystems, the restoration of degraded land and seascapes, ecosystem-based adaptation and agroecology- **allow us to address the climate and ecological crises in tandem, simultaneously delivering multiple benefits to society.** To ensure the 'permanence' or 'longevity' of nature protection and restoration actions carried out today, it is also key that economy-wide emission cuts be conducted in parallel this decade, so as to avoid that biodiversity-rich ecosystems protected today be converted in coming decades to bioenergy crops or BECCS, in the name of reaching the 1.5ºC goal through very-large scale CDR deployment.

3. Barriers to progress in the UNFCCC process

In the UNFCCC processes there are a number of issues that lead to negative outcomes for climate and nature: the way that carbon from natural systems is accounted for, how forests are defined and the lack of recognition of the role of oceans in the process.

No negotiations on measures to operationalise the ecosystems provisions of the Paris Agreement

While nature is not on the negotiating agenda at COP26, there are vital provisions under the UNFCCC and the Paris Agreement that must be operationalised in order to achieve integrated action to tackle climate change and biodiversity loss. These include the **ecosystem provisions of Article 4.1 (d) of the Convention, Article 5 of the Paris Agreement, and the text in the preamble of the Paris Agreement stating the "importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity"**. Additionally, in **paragraph 15 of COP decision 1/CP.25,** Parties recognized the need to address biodiversity loss and climate change in an integrated manner. In order to deliver synergistic climate and biodiversity action, **Parties need to reaffirm, strengthen and operationalize this important principle in the COP26 decision text.**

Forest definition: The current definition of "forest" used by the UNFCCC has serious flaws which leads to perverse outcomes for nature, climate and people. Replacing primary and intact forest landscapes with monoculture tree plantations devastates biodiversity, ecosystem integrity and stability, and leads to severe losses in ecosystem services, livelihoods and community resilience to climate change impacts. However, the definition does not distinguish between different types of forested landscapes (monoculture plantations are treated as equal to complex biodiverse natural forests); it cannot be used to address issues of degradation as it is limited to forest cover, thus obscuring important changes in forest structure, biodiversity and carbon stocks from being seen; it allows areas that are 'temporarily destocked' to still count as forested, with a loose definition of 'temporary'; and it sets the bar for deforestation so low that in many biomes, ecosystem collapse will have occurred long before the threshold is reached.

Accounting: Policies and accounting systems should reflect the real emissions that the atmosphere receives and should not encourage and incentivise activities that degrade natural ecosystems or their ability to store and sequester carbon. However, land use and forestry accounting under the Convention and the Kyoto Protocol, and widely taken forward by Parties

under the Paris Agreement, leads to enormous volumes of greenhouse gas emissions going unaccounted. This is because:

- Large-scale emissions from bioenergy are ignored from both the harvesting of forests for biomass combustion but also counted as zero when this biomass is burned in power plants, creating a substantial loophole that incentivises biomass burning and ecosystem destruction and has negative climate impacts.[33,34]
- Emphasis is often on carbon flows, rather than carbon stocks. Often, the foregone sequestration potential of forests and carbon pools such as forest soils are not considered.[35]
- Reporting of net flows conceals the activities that result in gross emissions or removals.
- Carbon stocks are considered fungible, that is, equivalent and transferable, and the accounting does not differentiate the quality of these stocks in terms of their longevity, stability and resilience.
- The baseline for reporting changes in net emissions is determined as the forest reference level that is based on existing harvesting levels, resulting in these emissions not being revealed in the accounts.
- Very large emissions from wildfires are also often not included in accounting despite being human-caused, and magnified due to climate change.

Hence current carbon accounting for LULUCF is not fit for the purpose of assessing climate mitigation activities, especially integrated solutions to address climate change and biodiversity loss (as per 1.CP/25 para 15), nor for encouraging parties to deliver an ecologically robust role for ecosystems in climate change mitigation. Current approaches solely focussed on annual net flows **obscure the important role of ecosystem integrity and stability (underpinned by the functional role of biodiversity) for reducing current and future risk of emissions from land, forests and other ecosystems**.

Guidelines for comprehensive accounting for carbon stocks and flows and the ecosystem service of global climate regulation assessed as carbon retention in ecosystems have been developed as part of the 'System of Environmental Economic Accounting - Ecosystem Accounts' (SEEA-EA). This system has been developed by an international community of experts coordinated by the UN Statistics Division and published jointly by the United Nations, European Commission, Food and Agriculture Organization of the United Nations, Organisation for Economic Co-operation and Development and the World Bank. The guidelines were adopted by the UN Statistical commission in March 2021 as a statistical standard. The SEEA-EA facilitates comprehensive accounting and recognises the importance of differentiating between the condition of ecosystems for the provision of all ecosystem services, including the climate regulating service of stable, long term carbon storage. Application of this system to carbon accounting in forests has been published[36].

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[33] Giuntoli, J., et al. (2020) Carbon accounting of bioenergy and forest management nexus. A reality-check of modeling assumptions and expectations. *Renewable and Sustainable Energy Reviews* 134: 110368. Available at: https://www.sciencedirect.com/science/article/pii/S1364032120306560?via%3Dihub

[34] Norton, M., et al. (2019) Serious mismatches continue between science and policy in forest bioenergy. *GCB Bioenergy*, 11: 1256– 1263. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/gcbb.12643

[35] Ter-Mickaelian, M. T., et al. (2015) The Burning Question: Does Forest Bioenergy Reduce Carbon Emissions? A Review of Common Misconceptions about Forest Carbon Accounting, *Journal of Forestry*, Volume 113, Issue 1, January 2015, Pages 57–68. Available at: https://academic.oup.com/jof/article/113/1/57/4599732

[36] Keith, H., et al. (2021) Evaluating nature-based solutions for climate mitigation and conservation requires comprehensive carbon accounting. *Science of The Total Environment.* 769 144341. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0048969720378724

Missing action on oceans: The ocean covers about three quarters of our planet. Yet, mangroves, saltmarshes and seagrasses - referred to as "coastal blue carbon"- are currently the only marine ecosystems included under national mitigation strategies, as planned by the UNFCCC and Paris Agreement. The IPCC's *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*[37] (the "Wetlands Supplement") provides GHG accounting methodologies for wetlands, both inland and coastal, thus supporting the inclusion of emissions and removals from these ecosystems in national GHG inventories and NDCs. Coastal blue carbon ecosystems not only provide climate mitigation benefits, but are key to adaptation by acting as buffers against the impacts of extreme weather events and sea-level rise. Their role has been recognised in NDCs since 2015[38] and is expected to be further reflected in countries updated NDCs submitted in 2020-2021. Beyond coastal blue carbon ecosystems, there are also some significant knowledge gaps remaining on the capacity of the ocean, and its ecosystems, to regulate climate change.

Most importantly, the ocean's ability to mitigate the impacts of climate change is rapidly declining due to anthropogenic stressors and the ocean will not be able to sustain its regulating activities much longer. As a new paper outlines[39], *all* marine sediments combine to form the largest pool of organic carbon on the planet. If disturbed by bottom trawling, these carbon stores can re-mineralize sedimentary carbon to CO_2, currently estimated to release 1.47 billion tonnes of aqueous CO_2 emissions annually, a volume similar to the global aviation industry which is likely to increase acidification, reduce the buffering capacity of the ocean and potentially add to atmospheric CO_2. Therefore, protecting the carbon-rich seabed is a potentially important strategy in addressing climate change, and it is currently missing from the UNFCCC process. There is significant room for progress to better understand and assess the role of the ocean and marine ecosystems in mitigating climate change. For instance, comprehensive guidelines for accounting of emissions from the fishing sector through its impact on fish populations and the seabed need to be developed so that Parties can start to better integrate the ocean into climate strategies.

4. What do Parties to the UNFCCC need to do?

a. Operationalize key ecosystem provisions of the UNFCCC and Paris Agreement

To fully operationalize the Convention and Paris Agreement provisions on ecosystems, as well as 1/CP.25 para 15, Parties would need to:

1. Acknowledge that **deep GHG emission cuts by 2030 alongside urgent action on nature conservation and restoration is absolutely essential to achieving the 1.5ºC goal and net-zero CO_2 emissions by mid-century** in a way **compatible with biodiversity conservation,** given it is the only way to reach 1.5ºC without jeopardizing the ecological stability and food production capacity of both land and sea.

2. Set out the operational steps that the UNFCCC needs to take, including a SBI and SBSTA joint work programme to address and agree on common approaches to conserve, enhance and support the long-term stability of carbon sinks and reservoirs in ways that are mutually supportive of biodiversity and adaptation.

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[37] IPCC (2013) *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*, Hiraishi T, Krug T, Tanabe K, Srivastava N, Baasansuren J, Fukuda M, and Troxler TG. (eds). Published: IPCC, Switzerland.

[38] Herr, D. and Landis, E. (2016). Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions. Policy Brief. Gland, Switzerland: IUCN and Washington, DC, USA: TNC

[39] Sala, E., et al. (2021) Protecting the Global Ocean for Biodiversity, Food and Climate." *Nature (London)* 592.7854: 397-402. Available at: https://www.nature.com/articles/s41586-021-03371-z

3. **Reject as 'climate and biodiversity incompatible' those 1.5ºC pathways that rely on large-scale deployment of land-based CDR such as afforestation and BECCS by 2050,** given the likely severe land conversion (including in biodiversity hotspots) they would likely cause, thereby likely severely overriding nature conservation carried out today.

b. Uphold and secure Indigenous and Community Land Rights

Upholding Indigenous Rights, including their right to self-determination and Free, Prior and Informed Consent is imperative to climate justice. Empowering indigenous communities, ensuring the recognition and legal enforcement of rights, including human rights, participation and land rights as part of a rights-based approach to climate action while extending indigenous management of natural ecosystems, is a fundamental and equitable strategy to tackle climate change and biodiversity loss. **Parties need to ensure that a rights based approach is followed during the UNFCCC policies, implementation and strategies for embedding the role of ecosystems in climate action.**

c. Embed the protection of nature into national climate plans

Including nature in NDCs, NAPs, LTSs and including measurable targets for delivery will help meaningfully raise ambition as Parties revise and submit their climate commitments in 2021. When doing so, Parties should:

- **Prioritise avoiding emissions from carbon stocks by protecting natural ecosystems** such as forests, seabeds, ocean ecosystems, grasslands, peatlands, mangroves and other wetlands- and **enhancing sinks through restoring and sustainably managing natural ecosystems in ways that are mutually supportive of biodiversity and thus enhance ecosystem integrity**;
- Ensure that land and ocean-based government **policies have strong safeguards** and do not undermine biodiversity, ecosystem resilience, or human rights. Governments should give precedence to policies that address more than one area across climate, development and nature, as part of a just ecological transition;
- **Facilitate synergistic partnerships between Indigenous Peoples, conservationists and governments** to ensure the fundamental role of indigenous land rights and tenure in the conservation of primary and intact forest landscapes and in achieving UN climate and biodiversity goals is recognised and supported;
- **Invest in sustainable agriculture** especially agroecology;
- **Include ending overfishing and a transition to low-impact ecosystem-based fisheries management** as key to ensuring the ocean can continue its crucial role in mitigating climate change and improve adaptation;
- **Align national climate plans with commitments under the CBD**, in particular National Biodiversity Strategies and Action Plans (NBSAPs) (and see point 5 below).

d. Integrate nature into COVID-19 stimulus packages and recovery plans

The COVID-19 pandemic has shown that halting the degradation and loss of natural ecosystems is a public health as well as climate priority. Protecting nature is not only

important to prevent future pandemics, but also critical for a just, equitable and sustainable financial recovery.
Massive financial commitments are currently being mobilised to mitigate the economic fall-out of the COVID-19 crisis. It is crucial these financial flows simultaneously stimulate countries' economic prospects, tackle the interconnected biodiversity and climate crisis and deliver sustainable development, whilst avoiding undesirable trade-offs for nature, climate, and people. To achieve these multiple objectives, investments in COVID-19 recovery should:

- Protect and build on pre-COVID-19 conservation investments and avoid the relaxation of environmental regulations in the name of COVID-19 recovery.
- Prioritise large-scale conservation and restoration efforts to halt the degradation and loss of natural ecosystems and to secure ecosystem services benefitting society and future generations, including through bolstering natural resilience to climate change.
- Prioritise 'green' infrastructure development, including biodiversity-inclusive renewable energy (appropriately located and operated to minimise impacts on nature) to reduce reliance on fossil fuels and forest products, and drive growth in green jobs.
- Reform and redistribute subsidies that are harmful to biodiversity and people toward biodiversity-inclusive and sustainable land-use practices to reduce emissions derived from unsustainable management of resources.
- Be tailored to the natural, cultural, socioeconomic and policy contexts in which they are applied and ensure inclusive governance processes that support IPLCs' rights and role in conservation of biodiversity and ecosystems.

e. Increase UNFCCC-CBD convergence

Linkages between the CBD and the UNFCCC should be strengthened to align ambitious goals and targets, maximize synergies between the two processes, and accelerate implementation. With the adoption of a post-2020 Global Biodiversity Framework at the CBD COP15, 2021 provides a critical window of opportunity to better connect the CBD and the UNFCCC, and use ecosystems to facilitate the alignment between the two processes. To increase UNFCCC-CBD convergence, Parties should:

- Work towards the adoption of a transformative Global Biodiversity Framework at CBD COP15. This framework should explicitly reference the role of ecosystem-based approaches in tackling climate change. It should also outline a series of goals and targets to address the pressures of unsustainable production and consumption on our ecosystems, especially by reducing the footprint of industrial agriculture and fisheries.
- Use existing initiatives and country coalitions such as the Leaders' Pledge for Nature, High Ambition Coalition for Nature and People, and Global Ocean Alliance, to better connect the CBD and UNFCCC and further push the need for integrated action on climate and biodiversity across the two processes.
- Strengthen domestic policy coherence between climate and biodiversity through the alignment of NDCs with the commitments under the Global Biodiversity Framework, and especially National Biodiversity Strategies and Action Plans (NBSAPs). The incorporation of ecosystems in enhanced NDCs would greatly benefit from the experience of NBSAPs.

- In the COP15 and COP26 Decisions, Parties should make joint calls for the establishment of more structured engagement between the two Conventions, namely:
    - **Between the SBIs: develop joint guidance for the development of NDCs that include biodiversity concerns**, as well as NBSAPs that reflect climate objectives.
    - **Between the UNFCCC SBSTA and CBD SBSTTA: jointly assess the best options for coordinated action on climate change and biodiversity, on a scientific basis**: this should focus not just on assessing synergies (e.g. ecosystem conservation) but also on trade-offs (e.g. bioenergy and land-based CDR such as afforestation and BECCS), and on how to reach the Paris Agreement's global net-zero goal in a way that respects global biodiversity goals.

f. Revise and enhance current carbon accounting rules

Comprehensive accounting of emissions and removals in the land sector needs to be firmly on the agenda of Parties in the run up to COP26 and when Parties devise how they account for their Nationally Determined Contributions (NDCs).

Parties should adopt in their national accounts a comprehensive accounting system, as per the approach developed by UN SEEA-EA and elaborated by Keith et al. 2021[40], to:

- Reflect the importance of maintaining and restoring ecosystem integrity for stable, long term carbon storage and reducing emissions;
- Facilitate integrated action to prevent biodiversity loss and climate change;
- Maintain and enhance other ecosystem assets, services and benefits to humans.

Doing so would promote synergies and facilitate consistency in policy development for the UNFCCC Paris Agreement with biodiversity imperatives outlined by the CBD and enhance consistency with other international conventions and processes.

g. Agree on robust rights-based social and environmental safeguards under Article 6

CAN reiterates that an agreement in 2021 of Article 6 rules should establish key robust rights-based social and environmental safeguards including a grievance mechanism governed by an independent body and adopt a partial cancelation rate for transferred credits to ensure real emission reductions. Any dialogue on Article 6 must serve as an opportunity to reaffirm the importance of environmental and social integrity of carbon markets, increase ambition of climate action and uphold human rights and Indigenous Rights.

h. Include spatial mapping of nature, carbon and other ecosystem services in NDCs, NBSAPs and wider national development planning

Mapping nature, carbon and other ecosystem services across national territories can identify priority areas for the protection, restoration and sustainable management of ecosystems to enhance biodiversity at the same time as climate change mitigation and other ecosystem services such as climate change adaptation and disaster risk

[40] Keith, H., et al. (2021) Evaluating nature-based solutions for climate mitigation and conservation requires comprehensive carbon accounting. *Science of The Total Environment.* 769 144341. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0048969720378724

reduction. This coordinated, spatially-explicit planning and implementation is essential to realise our global ambition across the nature, climate and sustainable development agendas, and to overcome the current inconsistencies that exist between Parties' restoration commitments submitted under the different Rio Conventions (UNFCCC, CBD, and UNCCD) and/or the Bonn Challenge[41]. Parties should therefore:

- Develop a common set of agreed principles and criteria under the UNFCCC, underpinned by a common accountability framework, to guide mapping of carbon, biodiversity and ecosystem services.
- Support data collection, management and development of spatial mapping tools and guidance.

i. Call for improving integration of climate and biodiversity through further IPCC-IPBES joint work in advance of the 2023 Global Stocktake

The December 2020 IPBES-IPCC co-sponsored workshop on biodiversity and climate change is a promising start to better integrating these two issues. However, much greater collaborative research is needed. Parties should call upon the IPCC and IPBES to further provide comprehensive assessments of the following in the run-up of the 2023 Global Stocktake:

- The importance of ecosystem conservation for climate change mitigation and adaptation;
- The negative biodiversity impacts (and impacts on other SDGs such as food security) of various 1.5ºC emission pathways, depending on how much they use land-based CDR such as afforestation and BECCS—this is in order to outline **mid-century net-zero emissions pathways that truly by mid-century maintain ecosystem integrity**.

The role of the UK presidency:

Throughout 2021, the UK presidency has the opportunity to raise the role of nature in scaling up climate action through three main approaches: leading by example, promoting the role of ecosystems and biodiversity, and enhancing synergies across the Rio Conventions, especially between the UNFCCC and CBD. To lead by example and raise the role of nature, the UK Government should embed nature protection and restoration into the UK Net Zero Strategy and its national climate plans, and should support and drive the incorporation of rigorous and ambitious ecosystem protection, restoration and sustainable management into Parties' enhanced NDCs, LTSs and NAPs. The UK government should also build momentum for nature using the COP26 Nature Campaign, and convene Ministerial dialogues on the co-benefits that well-designed actions working with and through nature can bring for biodiversity, climate, and people. To back this momentum, and ensure words can be put into action, the UK Government should encourage Parties, multilateral development banks and funding mechanisms under the UNFCCC to nature-proof existing finance and increase available finance for these high-quality nature-based actions. To enhance synergies, the UK Government should build on the Leaders' Pledge for Nature and the commitment of the High Ambition Coalition to support and drive the development of an ambitious and fully resourced Global Biodiversity Framework which explicitly recognises the role of nature for climate change mitigation and adaptation.

[41] Sewell et al. have found that "in many cases where countries have submitted commitments under at least two of the Rio Conventions and/or the Bonn Challenge, the numbers of hectares and the types of restoration measures differ". See: Sewell et al. (2020) Goals and Commitments for the Restoration Decade. PB: Netherlands Environmental Assessment Agency. Available at: https://www.pbl.nl/sites/default/files/downloads/pbl-2020-goals-and-commitments-for-the-restoration-decade-3906.pdf

ANNEX 1 - Key principles for the role of ecosystems in climate change mitigation and resilience

Some term the role of nature in tackling climate change as 'nature-based solutions' (NbS), regardless of the name nature and ecosystems have an important part to play as this briefing has underlined. However, this role can only be effective if actions working with and through nature are done well. The following are key principles for the role of ecosystems in climate change mitigation and resilience:

- Ecosystem-based climate action is only part of the solution. While it can and should enhance ambition, it **must not be a substitute for a rapid fossil-fuel phase out** and must not delay urgent action to drive down fossil fuel emissions.
- Indigenous peoples contribute significantly to achieving global climate and biodiversity goals (as recognised by IPCC and IPBES) through their sustainable management and conservation of primary and intact forest landscapes and other ecosystems. To enable them to continue, Indigenous Peoples and local communities must be consulted and involved in the elaboration and implementation of NbS, and the **land rights and tenure of Indigenous Peoples must be protected**, along with **their continued role in forest governance**.
- It is essential **to protect and restore existing carbon-rich ecosystems, and their key functions and biodiversity, which are crucial for the stability of these natural carbon stores**. Purely from a climate change mitigation perspective, it is an urgent priority to avoid destroying or damaging primary intact natural forests and other carbon rich ecosystems such as peatlands, mangroves, estuaries, seagrass and grasslands, and to avoid turning them from carbon sinks into carbon sources. **Without this, limiting warming to 1.5 degrees is unachievable.**
- Some activities identified as "nature-based solutions" do not yield the same climate and biodiversity benefits as natural ecosystem conservation and restoration. Reforestation in the form of monoculture tree plantations, for example, stores significantly less carbon, supports much less biodiversity and is highly susceptible to damage and loss from pests, diseases, drought, fire and climate change - so plantation forestry is a significantly worse option than improved protection and restoration of primary intact natural forests (Lewis and Wheeler 2019[42]; Wang et al. 2019[43]). Planting new trees simply cannot replace the existing carbon stocks in primary and intact forests over in relevant timeframes.
- Currently, high level multilateral pledges for nature mainly focus on forests. It is crucial that the current emphasis on forests does not detract from other ecosystems that store large amounts of carbon and provide irreplaceable ecosystem services. Financial support for biodiversity conservation and ecosystem restoration action is an urgent climate finance priority for **all** carbon-rich natural ecosystems.

[42] Lewis S.L., et al. (2019) Restoring natural forests is the best way to remove atmospheric carbon. *Nature*, 587.7750: 25-28. Available at: https://www.nature.com/articles/d41586-019-01026-8

[43] Wang, X., et al. (2019) The biodiversity benefit of native forests and mixed-species plantations over monoculture plantations. *Diversity and Distributions* 25.11: 1721-1735. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/ddi.12972