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Platform on Biodiversity and
Ecosystem Services**

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**Plenary of the Intergovernmental Science-Policy
Platform on Biodiversity and Ecosystem Services
Ninth session**

Bonn, Germany, 3–9 July 2022

Item 7 (d) of the provisional agenda*

**Assessing knowledge: engagement with the
Intergovernmental Panel on Climate Change****Compilation of suggestions from members of the
Intergovernmental Science-Policy Platform on Biodiversity and
Ecosystem Services for thematic or methodological issues
related to biodiversity and climate change that would benefit
from collaboration between the Intergovernmental Panel on
Climate Change and the Intergovernmental Science-Policy
Platform on Biodiversity and Ecosystem Services****Note by the secretariat**

1. In paragraph 8 of section II of decision IPBES-8/1, the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) welcomed the note by the secretariat on the work on biodiversity and climate change and collaboration with the Intergovernmental Panel on Climate Change (IPCC) (IPBES/8/6). In paragraph 9 of the same decision, the Plenary invited the Bureau and the Executive Secretary of IPBES to continue to explore with IPCC approaches for future joint activities between IPCC and IPBES, including those outlined in section II of document IPBES/8/6, taking into account the need for transparency of any joint activity, in conformity with the decisions of IPCC and of IPBES and their respective policies and procedures, and requested the Executive Secretary to report to the Plenary at its ninth session on progress in that regard.
2. In paragraph 10 of the same decision, the Plenary requested the Executive Secretary to invite members to submit suggestions for thematic or methodological issues related to biodiversity and climate change which would benefit from collaboration between IPCC and IPBES and requested the Executive Secretary to make a compilation of those submissions available to the Plenary at its ninth session. In response to the request by the Plenary, the Executive Secretary, in notification EM/2022/10 of 10 March 2022, invited members to submit, by 15 April 2022, suggestions for thematic or methodological issues related to biodiversity and climate change which would benefit from collaboration between IPCC and IPBES.
3. A compilation of the suggestions received is set out in the annex to the present note, without formal editing. Any additional information received as part of the submissions by members is reproduced in its original form, also without formal editing, in the appendices to the annex.

* IPBES/9/1.

Annex*

Suggestions from members of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services for thematic or methodological issues related to biodiversity and climate change that would benefit from collaboration between the Intergovernmental Panel on Climate Change and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

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Overview of comments received

Country	Suggestions
Germany	We hereby submit our proposals as per Appendix 1. Furthermore, in light of Decision IPBES-8/1, which also calls for continued exploration of approaches to future joint IPCC-IPBES activities that take into account the mandates of both bodies, we propose the establishment of a temporary IPBES-IPCC ad hoc group as a realistic option for launching possible future joint activities. We would like to recommend the establishment of such a group via this submission to IPBES so that IPBES can approach IPCC accordingly. In our opinion, the ad hoc group could 1) be tasked with exploring procedural options for future collaboration and 2) could conduct an initial scientific and technical review of the thematic and methodological issues submitted by IPBES members with a view to developing a concept for IPBES 10 in 2023 on whether and by what procedures these contributions could be taken up jointly by IPBES and IPCC.
France	France would like to suggest one thematic issue relating to synergies and tradeoffs between clean energy and biodiversity protection as well as one methodological issue on developing joint scenarios for IPBES & IPCC, including social aspects, multiple spatial and temporal scales and regime shifts (see Appendix 2). [THEMATIC] How to reconcile the production of "clean" energy (low CO2) with biodiversity conservation to achieve climate mitigation and stopping biodiversity loss objectives? Thanks to the IPCC, the world has realized that the use of fossil fuel needs to be reduced to minimize climate change. It is of upmost importance to ensure that the replacement energy does not endanger biodiversity. The concept of 'renewable' or 'clean' energy will need to be defined, notably in light of biodiversity protection and sustainable use. Biomass burning (e.g. peat, wood) can be especially destructive, and hydroelectric plants can both disrupt the functioning of aquatic ecosystems and cause extensive loss of natural habitats and trigger large methane emissions. Likewise, supply chains of materials used in low emissions technologies (such as rare earths for wind farms' permanent magnets) are often associated with biodiversity impacts. An assessment to identify the risks of collateral damage to biodiversity and to find ways to mitigate or to avoid them (including decrease in energy consumption) is needed. Moreover, renewable energies require materials derived from biodiversity or likely to cause environmental damage (e.g. balsa wood for wind energy, rare earths for solar energy). The biodiversity-energy nexus should therefore be analyzed from a life-cycle analysis perspective and take a wide range of co-benefits and adverse effects into account (including induced impacts). Such work would further support the integration of biodiversity concerns in climate research and policy. The dramatic shift to renewable energies that is required to keep global warming within 2°C would lead to significant land- and sea-use changes, with competing uses between energy and food production and the protection of wild areas. The IPBES Global Assessment Report and the upcoming assessment of the sustainable use of wild species (for biomass energy) are tackling this issue in some more details. Given the current pace of development and implementation of renewable energy, significant attention should be given to this

* The annex has not been formally edited.

Country	Suggestions
	<p>topic to support policymaking in several sectors, including energy, transportation, agriculture and biodiversity. The IPCC should be involved in supporting the preparation of the IPBES 'nexus' assessment in the upcoming IPCC assessment cycle. Policy wise, this would support the implementation of regional and national policies, such as the European biodiversity strategy for 2030, which calls for "win-win solutions for energy production", is also looking at how to be self-sufficient in energy production. Solutions based on biodiversity (such as nature-based solutions as described in the UNEA5 resolution) that generates long-term outcomes for both biodiversity protection and climate change adaptation and mitigation, should also be analyzed and promoted.</p> <p>[METHODOLOGIC] Developing joint scenarios for IPBES & IPCC, including social aspects, multiple spatial and temporal scales and regime shifts. This area of work would be useful for both IPBES and IPCC since it has been acknowledged by both climate and biodiversity communities that current global scenarios are largely looking into climate change parameters (CO2 emissions and temperature) but hardly integrating biodiversity change parameters. Current scenarios used by IPBES and IPCC lack consideration of the interplay and feedback loops between biodiversity loss, climate change, land- and sea-use change, exploitation/management strategies, pollution and invasive alien species, including what the consequences of and for the redistribution of species communities and ecosystem functioning are. A methodological work, supported by a review of existing scenarios at various scales looking into the interplay of those drivers, taking into consideration social aspects (including economy, public policies and governance), would be very valuable and useful for future thematic assessments. It could explore ways to harmonize spatial and temporal scales of the diversity of scenarios used both in climate and in biodiversity research. Intergovernmental platforms could further support policy-making by providing support down to national scales. Working on different scales could also enable better understanding of the wide range of potential biodiversity responses to a set of climate data. Working on temporal scales is a good entry point for interdisciplinary work, in order to understand the key issues for different stakeholders, over a short- to long-time horizon. Looking at medium- to long-term horizons, adaptation assessment of biodiversity would also be key to enable synergies with the ongoing work on biodiversity and climate change scenarios.</p>
Japan	Please refer to Appendix 3.
Italy	<p>The Glasgow Pact, in his preamble, recognizes "the interlinked global crises of climate change and biodiversity loss, and the critical role of protecting, conserving and restoring nature and ecosystems in delivering benefits for climate adaptation and mitigation, while ensuring social and environmental safeguards"; in section IV, it "emphasizes the importance of protecting, conserving and restoring nature and ecosystems, including forests and other terrestrial and marine ecosystems, to achieve the long-term global goal of the Convention by acting as sinks and reservoirs of greenhouse gases and protecting biodiversity, while ensuring social and environmental safeguards; Symmetrically, in the text of the Draft recommendation submitted by the Co-Chairs of the CBD's OEWG, Agenda item 4 (CBD / WG2020 / 3 / L.2), target 8 aims to "minimize the impact of climate change on biodiversity, contribute to mitigation, adaptation and resilience including through [nature-based solutions] and [ecosystem-based approaches], and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity. The two texts address the role of land-based activities to minimize the impacts of climate change on the state of biodiversity (also through new approaches to protection and restoration) and on the provision of ecosystem services and, at the same time, maximize the role that the same activities have regard to mitigation and adaptation to climate change. It would be appropriate that IPBES and IPCC, building on previous work carried out by the two scientific platforms, including the latest joint report, harmonize the language and purposes of section IV of the Glasgow Pact and of the target 8 of the post-2020 GBF and produce guidance for help countries identify the best ecosystem based approaches and/or nature based solutions that can be implemented across all country-specific ecosystems, as well as mitigation potential. This could help to increase the synergies, often evoked, between the two conventions and avoid double accounting of interventions. In addition, other issue that have arisen by other colleagues are:</p> <ul style="list-style-type: none"> - role of the conservation, restoration and management of ecosystems, namely forests and/or other carbon-rich ecosystems, in climate change mitigation; - role of the biodiversity-inclusive spatial planning addressing land use change in climate change mitigation; - nature-based solutions and/or ecosystem-based approaches as win-win solutions in addressing both biodiversity and climate change crises; - assessment of climate change mitigation and adaptation efforts with negative or positive impacts on biodiversity; - increasing the area of and the access to green and blue spaces in urban areas in climate change mitigation and adaptation; - increasing productivity and resilience of production systems (agriculture, aquaculture, forestry) through sustainable management in the production and consumption chain, as a tool to address both biodiversity and climate change crisis.

Country	Suggestions
Belgium	<p>1) Ensuring just transitions, equity and sustainable livelihoods while tackling climate change and biodiversity loss.</p> <p>2) Links between biodiversity, climate change, and trade (incl. trade-related deforestation contributing to climate change).</p> <p>3) Nature-based solutions to simultaneously tackle biodiversity loss & climate change, specifically in urban contexts.</p> <p>4) Interlinkages between biodiversity, climate change, and energy production (or how to ensure that renewable energies/low-carbon technologies are not harmful to biodiversity, e.g. hydropower, biofuels,...).</p> <p>5) Biodiversity and climate change feedback processes (involving biodiversity and ecosystems which may in turn amplify or diminish the effect of climate change). This could include a focus on the consequences of climate change induced degradation of peatlands on their vegetation and the consequences of this vegetation change on carbon storage and greenhouse gas budget of such sites. Other possible focus areas include role of microbial biodiversity in these feedback processes.</p> <p>6) Relation between climate change and frequency of pest and disease outbreaks (possible link with the IAS assessment, and the Pandemics report).</p> <p>7) Impact of extreme weather events on biodiversity.</p>
New Zealand	<p>Recommend a focus on a joint report/paper and specific topic, noting that the previous technical report had extensive topical coverage, was difficult to synthesize and made numerous points which had potential implications for countries.</p> <p>1) Joint methodological report/technical paper focused on downscaling scenarios: Global to national to local scale is essential for the work from IPCC/IPBES to become more accessible. Consider a focus on the SSP's (SSP/RCP combinations and basis for the climate projections), what do those mean for us nationally? What are the implications for biodiversity globally and nationally? What are the climate change implications for biodiversity globally and nationally based on the future projections? What are the consequences of not doing actions? What the trade-offs and where and at what scale are they critical? How we consider the implications of short-term big disruptions vs long-term risks from a changing climate and the trade-offs at different scales (local vs landscape)? These perspectives could be encapsulated in a special report.</p> <p>2) Nature-based solutions: what are they, what's working for climate change mitigation and/or adaptation and at what scale? What are the implications for biodiversity? For example, protection of biodiversity necessitates back-country access; government policy requires a reduction in emissions restricting choices of transport (e.g. reduction in helicopter use). Need to consider costs and benefits from an emissions reduction and biodiversity loss perspective and at what scale it "matters".</p> <p>3) The last section of the workshop report (section 7) solutions at the climate-biodiversity-society nexus may be suitable for a report. The focus could discuss Nature Based Solutions in the context of the different goals from the CBD, the SDG's and the Paris Agreement: how do they link, interact, or contradict?</p> <p>4) Joint technical report which considers the different kinds of trade-offs between biodiversity and climate change and the different kind of policy decisions that need to be made. Take account of trade-offs that operate at a range of scales and choices about land use, domestic and endemic species.</p>
Canada	<p>Collaborative work presents an opportunity to broaden the expertise brought to bear on the interlinked issues of biodiversity and climate change, and also to avoid the duplication of work. Nonetheless, collaborative work must respect the structure of each organization. IPCC is completing its 6th cycle, and considerations of work to be undertaken in its 7th cycle will not be undertaken until the fall: in this context, the ability of the IPCC working groups to provide scientific input will be limited for some time to come. An IPBES-led project with contributions from scientific experts who have contributed to the IPCC AR6 assessment cycle or will contribute to the AR7 assessment cycle can be undertaken more readily than formal collaborative work. Such an approach avoids the need for lengthy processes such as parallel decisions in both bodies or the establishment of a new liaison body. Such a project is already underway: Climate change is interwoven among the considerations to be included within the Nexus assessment, and this provides an opportunity to engage more fully with IPCC authors and experts. Nexus coordinating lead authors are already reaching out to IPCC experts in an ad hoc manner. This outreach could be formalized by inviting the IPBES Secretariat to extend an invitation to the IPCC community at large to engage as contributing authors and reviewers. As IPCC begins to consider work to be undertaken in its 7th cycle, it should be made aware of the status of work on the Nexus assessment, so that it may use the Nexus assessment as input in its own assessments and so that it may avoid the duplication of work. This could include presentations by Nexus authors to the IPCC. Such a decision at IPBES-9 should also include formal direction to Nexus authors to take into consideration the relevant findings of the reports from the 6th cycle of the IPCC: while this is implicit in paragraph 15 of the scoping document, there is value in highlighting the importance of the IPCC findings and their strong linkages to biodiversity. The 2021 joint workshop produced a scientifically valuable document, and this format could potentially be used to address specific areas of work, with the caveat that workshop outputs should be presented clearly as scientific papers, without IPBES or IPCC branding that</p>

Country	Suggestions
	<p>has the potential to create an impression that these products are similar to assessments or that they were formally endorsed in some manner by these organizations. (Most users will not be aware of the distinction between an assessment which has undergone multiple rounds of expert review, including government review, and a supporting document which has not.) Instead, such papers could undergo peer review and be published in the scientific literature. They could be made available to assessment authors as preprints prior to publication. Subjects for such workshops could include:</p> <ol style="list-style-type: none"> 1) Recommendations for shared definitions of key terms, which could then be independently reviewed and approved by each organization. Agreed definitions could be incorporated into a joint glossary. 2) Analysis of expected outcomes (climate, biodiversity and socioeconomic) of actions undertaken to address the ‘triple crisis’ of climate change, biodiversity loss, and pollution. Evidence is building that actions taken to address biodiversity are generally neutral or positive for climate, (eg. IPCC WGII assessment – Chapter 2, Shin et al 2022 https://doi.org/10.1111/gcb.16109), although the reverse may not be true for all climate mitigation activities. Given the need for rapid action to avoid further declines in the global life support system, rapid, responsive, adaptive management is a key element. Joint workshops could synthesize emerging evidence to allow adaptive management on rapid time scales.
The Netherlands	<p>First of all, we believe that IPBES and IPCC could benefit a lot from strengthening cooperation and exchange in relation to the approach towards scenarios and models. The Netherlands Environmental Assessment Agency for instance has a lot of methodological expertise that could feed into both IPBES and IPCC assessments. In addition, we would like to ask the IPBES secretariate to engage with the IPCC to work towards a Special Report on climate and biodiversity ideally for the 7th Assessment Cycle of IPCC. Finally, last week a paper by IDDRI was published that provides some interesting input regarding the collaboration between IPCC and IPBES (see Appendix 5). We believe that in particular the following issues are relevant to consider. Three key issues that previous IPCC Reports and the IPCC-IPBES CSWR have not yet fully assessed, and which should therefore be central to a joint climate-biodiversity Special Report are:</p> <ul style="list-style-type: none"> • Further assess sustainability thresholds for bioenergy (with and without CCS) and other land-based CDR and mitigation measures (e.g., afforestation); • Detail out the biodiversity, land-use conversion and food security impacts of different 1.5°C mitigation pathways; • Assess and develop sustainability pathways that reach both the 1.5°C goal while keeping within biogeochemical and ecosystem planetary boundaries and ensuring other Sustainable Development Goals (e.g., food security) can be met.
European Union	<p>Suggestions from European Commission colleagues for suggestions for thematic or methodological issues related to biodiversity and climate change which would benefit from collaboration between IPCC and IPBES:</p> <ol style="list-style-type: none"> 1) A process suggestion. Whatever the eventual topic of this work, please to have parity on both the IPBES and IPCC sides, so that none of both bodies feels that the credibility of it would be at stake. 2) To work towards a joint assessment proposal for IPCC’s September’s bis plenary after the SYR adoption. New IPCC cycle starts soon with already heavy workload (special report on cities, finishing a report on SLCF, potential dedicated report on contribution of IPCC to the global stocktake). If enough support by IPCC members, an ‘extra’ special joint IPCC-IPBES assessment might be commissioned. 3) Both IPCC and IPBES are very busy, which makes it difficult to plan a ‘joint deliverable’. However, maybe they could envisage ‘joint chapters’ in their upcoming respective reports/assessments. At IPBES 8 the discussion on the scoping of the Nexus Assessment was very difficult because of the opposition of some countries who keep on insisting in the ‘different mandates’, which is really counterproductive when above all breaking silos and smart collaboration is key for addressing the planetary emergency we are in. This need for smart collaboration is also valid for science providers such as IPCC and IPBES. 4) IPCC AR6 WG2 demonstrates the interdependence between climate change and biodiversity loss and the utmost urgency to act on both emergencies in an integrated manner. This reconfirms outcomes of earlier IPCC reports and IPBES assessments and also the findings of the IPBES IPCC expert workshop report. Maybe IPCC and IPBES could envisage joint communication and promotion activities on these and future respective findings. 5) Could the IPCC AFOLU experts receive an information package/session on contents from and ways to cooperate with IPBES? Similarly, experts working on climate-related issues in IPBES to be specifically briefed on IPCC? [Beyond on what is guaranteed by the nomination of authors having worked for both panels/platforms]. 6) IPCC focal points could be particularly invited to join virtually IPBES-9 delegations for the point of discussion on cooperation IPCC-IPBES 7) A simple exchange of planning agendas, possible topics, modalities and possibilities for collaboration. 8) Align languages between IPBES and IPCC – common terms in glossary

<i>Country</i>	<i>Suggestions</i>
	9) Learning from negotiation procedures – what works particularly well in both bodies, what are common challenges.

Appendix I*

Additional information submitted by Germany: Possible IPBES-IPCC collaboration themes submitted by Germany

According to decision IPBES-8/1, paragraph 10, IPBES member countries were invited to submit proposals on thematic or methodological aspects in the field of biodiversity and climate change that would benefit from cooperation between IPCC and IPBES.

In response to this request, the German IPBES coordination office, in consultation with the German IPCC coordination office, were asked to invite national experts who had participated in the IPBES-IPCC workshop (see [Scientific Outcome](#) and [Workshop report](#)). The Government of Germany would like to thank Prof. Hans-Otto Pörtner (Alfred Wegener Institute, AWI) and Prof. Almut Arneth (Karlsruhe Institute of Technology, KIT) for coordinating the expert consultation to identify thematic or methodological issues that would benefit from collaboration between IPCC and IPBES, and also thanks its national IPBES and IPCC coordination offices for providing technical support.

The topics marked in yellow represent the priorities for the German government regarding future collaboration between IPBES and IPCC.

<i>Topic</i>	<i>Background</i>	<i>Contribution from experts working in IPBES/IPCC</i>	<i>Experts</i>	<i>Comments from IPBES / IPCC Coordination office</i>
<i>Resilience</i>				
Weather extremes: Quantify the role of biodiversity for ecosystem resilience	Climate change will be impacting numerous marine, freshwater and terrestrial ecosystems. Diverse ecosystems (genetic diversity, species diversities and habitats) are thought to be more resilient to climate change impacts, and hence also important for ecosystem services related to climate change adaptation. But it is still difficult to quantify this and in particular, the interplay between biodiversity and extreme weather events (droughts, flood, heatwaves) and related ‘biotic’ extremes (insect outbreaks, algae blooms) are not well understood. Both in terms of risks TO biodiversity and in terms of biodiversity reducing the risk of ecosystem damage from climate extremes.	IPCC: projections of climate extremes and potential impacts on ecosystems and local human societies, acclimatization and adaptation limits of species and ecosystems under individual and combined climate drivers, velocity of evolutionary adaptation processes (over generations) in relation to climate velocity IPBES: observational evidence and projections of biodiversity and ecosystem services in response to weather extremes. Experimental evidence for biodiversity effects on ecosystem resilience. Feedback effects of biodiversity on climate extremes (albedo, volatile emissions etc.)	Almut Arneth Nico Eisenhauer Ute Jacob Hans-O. Pörtner	
Effects of interventions on the resilience of	Examining the effects of interventions on the resilience of different ecosystems against climate change should			Proposal by BMBF 617

* The appendix has not been formally edited.

<i>Topic</i>	<i>Background</i>	<i>Contribution from experts working in IPBES/IPCC</i>	<i>Experts</i>	<i>Comments from IPBES / IPCC Coordination office</i>
different ecosystems against climate change	provide information on those interventions which are most effective in terms of optimally linking biodiversity and climate protection goals. The aim would be to provide decision-makers at subnational levels (e.g. municipalities and at federal level), as well as social actors scientifically sound and evidence-based set of tools to support implementing concrete interventions that are optimally tailored to the respective circumstances and situation.			
<i>Trade-offs & Synergies</i>	Regional climate trade-offs and synergies arising from biophysical and biogeochemical processes	Land-based mitigation measures can affect climate through biophysical mechanisms, including local climate feedbacks that may in some regions be different in terms of direction from global effects. These biophysical processes can even have climate impacts thousands of kilometers away ('teleconnections' are still poorly understood). Many of these effects are not included in UNFCCC mitigation project guidelines, compromising the full quantification of mitigation effectiveness.	(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	
Acknowledging the trade-offs	The competition for land: By 2050, in 1.5°C pathways, renewable energies are expected to supply primary energy and food demand is projected to increase substantially. Conversion of areas would jeopardize existing land- or marine-area-related biodiversity conservation measures. Both land- and ocean-based mitigation activities are already contributing to climate change mitigation and can further contribute to limiting warming to 1.5 or 2°C. Trade-offs and compromises are inevitable and require management for carbon uptake as well as energy mixes that minimize net environmental damage associated with addressing mitigation-related biodiversity and adaptation impacts. There is a clear need for transformative change in the land and ocean management, and food and energy production sectors to achieve these mitigation potentials and capitalize on their climate change adaptation and biodiversity conservation co-benefits.		(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	In particular bioenergy

Topic	Background	Contribution from experts working in IPBES/IPCC	Experts	Comments from IPBES / IPCC Coordination office
Synergies and trade-offs between climate mitigation via land-based CO ₂ removal techniques and the protection of biodiversity	Land-based Carbon Dioxide Removal (CDR) techniques, such as BECCS or afforestation, generally also impact biodiversity and trade-offs and synergies have been widely discussed in the literature. The biodiversity community is often much more critical than the climate change community. The coverage in assessments so far was mostly very general, e.g. global level, which does not help with implementing solutions at regional scales.	Special working group with report on the topic (or making sure that this is captured in the nexus assessment). With a focus on regional examples at a level of detail that really helps implementation, i.e. moving beyond simple land use classes, such as “second-generation bioenergy crops”, which are used in IAMs.	Thomas Hickler Josef Settele Almut Arneth & (Smith <i>et al.</i>) Pete Smith David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	Land-based Carbon Dioxide Removal (CDR) options
Trade-off in land use and conservation management in relation to climate and biodiversity effects (cultural landscapes)	Reducing biodiversity loss and enhancing biodiversity in agricultural systems can help mitigate climate change and enhance a wide range of Nature's Contributions to People (NCPs). Biodiversity can be promoted in agricultural systems directly – for example, through greater crop diversity, agroforestry or integration of crop production with livestock raising or aquaculture; or indirectly through practices that are biodiversity friendly – for example through organic amendments to soils, reduced tillage or reduced pesticide use.	IPCC & IPBES: analyse GHG emissions and biodiversity protection within the set of other services (trade-offs; win-win systems). Role of lifestyle and dietary changes in benefiting both biodiversity and climate, with elaboration of regional specificities, e.g. freeing land by reduced meat consumption (considering that internationally 80% of cultured land is used to produce animal feed, not food for human consumption).	Josef Settele Ute Jacob Almut Arneth Hans-O. Pörtner	
Impacts on biodiversity arising from technological mitigation measures	Multiple technologically focused mitigation measures are in place or under development on land and in the oceans. Many of these are less (land) area demanding and/or are considered to have high mitigation potential. However, all these mitigation measures could potentially harm the environment, including biodiversity and good quality of life (Biodiversity impacts from: mining in the ocean and on land; wind power; solar power; hydro power; enhanced ocean carbon uptake; ocean-based renewable energy; accelerated mineral weathering; producing biochar. Strong environmental and social sustainability criteria are needed importance of circular economy needs to be emphasized).		(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	

<i>Topic</i>	<i>Background</i>	<i>Contribution from experts working in IPBES/IPCC</i>	<i>Experts</i>	<i>Comments from IPBES / IPCC Coordination office</i>
<i>Protection & Restoration</i>				
Actions that benefit both climate and biodiversity (Protect, Restore, Manage, Create)	<p>Protection and restoration of biodiverse and carbon-rich ecosystems on land and sea is the top priority from a joint climate change mitigation and biodiversity protection perspective. Only if climate change is simultaneously mitigated through ambitious reductions in GHG emissions from fossil fuels can the ambition to protect, sustainably manage and restore natural ecosystems be achieved.</p> <p><u>Protect</u>: Reduction of emissions from deforestation and forest degradation; Conservation of non-forest carbon-rich ecosystems on land and sea. <u>Restore</u>: Restoration of degraded land and ecosystems including marine. <u>Manage</u>: Climate- and biodiversity-friendly agricultural, forestry, fishing and aquaculture practices; Localization of supply chains; Changes in consumption. <u>Create</u>: Urban greening and biodiversity support; Trophic rewilding; Combined technology- and nature-based mitigation options; Mitigation opportunities on newly emerging habitats.</p>		(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	
<i>Soil & Soil Biodiversity</i>				
The role of soils and soil biodiversity for ecosystem Carbon storage and resilience to climate change/extremes	Soils store a major fraction of Carbon, can act as Carbon sinks (e.g. Carbon sequestration) and sources (e.g. decomposition processes) depending on management and other human impacts, and thus play a critical role in climate change mitigation. The role of soil biodiversity in this process is highly underappreciated but needs consideration in future Earth System Models.	IPCC: projections of climate change and ecosystem Carbon-cycle IPBES: observational and experimental evidence as well as projections of the role of soil biodiversity in soil C dynamics	Nico Eisenhauer	
Feedback effects of climate change and soil loss (e.g. erosion, sealing)	The soil is the Earth's thin skin playing a critical role in greenhouse gas dynamics/emissions, volatile emissions, but the formation of soils takes thousands of years. At the same time, soils are increasingly lost through accelerating processes like erosion and sealing, making this highly functional layer and increasingly limited resource.	IPCC: consider soil loss in scenario modelling IPBES: define the multiple roles that current and future soils play in climate and biodiversity change	Nico Eisenhauer Josef Settele	
<i>Scenarios and Modeling</i>				
New regional and global scenarios, beyond the 'climate-centric' approach	Global emission, land-use change and socio-economic change scenarios for the IPCC are being produced by the Integrated Assessment Models (IAM) community, with a strong focus to support the climate change modelling community. These scenarios are also being adapted for	IPCC: Future scenarios of land-use change and freshwater and marine resource use that attempt to capture also part of the goals/visions laid out in the Nature Futures Framework (NFF).	Almut Arneth	

<i>Topic</i>	<i>Background</i>	<i>Contribution from experts working in IPBES/IPCC</i>	<i>Experts</i>	<i>Comments from IPBES / IPCC Coordination office</i>
	<p>analysis in IPBES. However, the new IPBES Nature Futures Framework (NFF) asks for scenarios (and analysis of modelling outcomes) that put Biodiversity and ecosystem services much more strongly in the centre of scenario development. Whether or not Integrated Assessment Models (IAM) are the best tools to do so, and/or how alternative modelling tools would need to look like is still open.</p>	<p>IPBES: Explore novel modelling approaches, and design analytical ways to i) create global scenarios (of e.g. land-use change) that capture an alternative range of plausible futures and pathways to achieve these and,</p> <p>ii) use these (and IPCC) scenarios in impact models and analyse outcomes in view of the Nature Futures Framework (NFF)</p>		
<i>Food Security / Consumption and Production</i>				
Demand side action on food and energy	From previous IPCC and IPBES reports it is well	IPCC: develop modelling tools and scenarios that	Almut Arneth Josef Settele	
<i>Land-use and land management</i>				
Challenges arising from competition for land	Outlining some of the ecosystem interventions, and technological interventions that affect land or ocean-based ecosystems, that risk harming biodiversity outcomes. Not all interventions in land and ocean ecosystems that aim to deliver climate change mitigation are necessarily beneficial for biodiversity, especially if implemented incorrectly (methodological flaws in Reforestation and afforestation; Large areas of bioenergy crops; Fuel switching; the influence of supply chains).		(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhiro Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	
<i>Socio-ecological aspects including governance</i>				
Learning from the past to inform the future	Future responses of biodiversity to climate change can be	IPCC: Paleoclimate data (IPCC Working Group I)	Wolfgang Kiessling	
	partially projected from past responses. Specific traits and environments of ancient species rendered them particularly vulnerable to climate change, whereas others are	and past responses to climates change (IPCC Working Group II).		
	surprisingly robust. Long-term perspectives on the intertwining between climate-change and biodiversity are	IPBES: Quantifying the role of direct human		
	urgently needed, especially concerning extinction risk.	impacts on biodiversity relative to climate change.	Bridging time scales as major challenge.	

Topic	Background	Contribution from experts working in IPBES/IPCC	Experts	Comments from IPBES / IPCC Coordination office
Protected areas and ecosystem restoration in the climate/biodiversity nexus	<p>Protection and restoration of ecosystems on land and sea is widely regarded as a win:win strategy for biodiversity, with potential co-benefits to multiple ecosystem services and human well-being. If restored ecosystems are C-rich, co-benefits for climate change mitigation can also be expected (cf. post2020 CBD framework). However, many facets of the potential win:win and trade-offs are incompletely understood. Ranging from societal conflicts arising from protection/ restoration (taking land out of other uses, re-emergence of large herbivores and carnivores). Where are which societal perceptions and conflicts at play? How do altered trophic chains affect C-cycle and climate mitigation in protected areas.</p>	<p>IPCC: projections of climate change and ecosystem C-cycle (models without or incomplete representation of plant-animal interactions and ensuing C-cycle impacts)</p> <p>IPBES: observational evidence and projections of trophic chains and impacts on ecosystem C (and N) pools and fluxes.</p> <p>Societal perceptions, costs/benefits/values of protected areas and restoration.</p>	Almut Arneth & (Smith <i>et al.</i>) Pete Smith David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	
Biodiversity and Ecosystem Services in changing socio-ecological landscapes	<p>The demand we are placing on ecosystem services has triggered accelerated rates of biodiversity change and created trade-offs among the services we depend upon. Decisions designed to reverse and mitigate these trends require the best possible information obtained by monitoring ecological and social dimensions in the face of climate change.</p>	<p>IPBES/IPCC: Integrating qualitative and quantitative knowledge of social–ecological systems to provide a causal understanding of the impacts of biodiversity loss and climate on human well-being.</p>	Ute Jacob Almut Arneth	
Combinations of measures that are locally adjusted and societally accepted	<p>Approaches that are multi-pronged and emphasize decarbonization of economies and the energy sector in the short term, as well as implementing nature-based solutions that have strong capacity to sequester carbon as well as bringing benefits for local communities, have a better chance of success. Nature-based solutions can provide significant mitigation potential this century. In published global assessments of mitigation potential, the fundamental context-specific interactions, opportunities and limits arising from a specific location (such as ecosystem type, local governance or the mix of decision-making actors) thus far have not been accounted for but are important when implementing mitigation measures ‘on the ground’. Positive synergies are possible when combining measures that act on the supply as well as demand side, for instance adjusting diets towards a considerably reduced animal protein intake, reducing food waste, and measures to reduce expansion or over-intensification in agriculture and fisheries.</p>		(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	

<i>Topic</i>	<i>Background</i>	<i>Contribution from experts working in IPBES/IPCC</i>	<i>Experts</i>	<i>Comments from IPBES / IPCC Coordination office</i>
Social issues and the ‘securitizing’ of climate change	<p>Nature-based solutions provide co-benefits to biodiversity as well as for local communities, promoting improvements in quality of life and governance.</p> <p>→ Realizing the full potential of nature-based solutions, including their social co-benefits. (Incentives e.g.: attractive carbon price; create international carbon markets).</p> <p>→ Changes in the way we relate to ourselves and the rest of nature</p> <p>→ ‘nature-based human development’ (UNDP, 2020).</p> <p>→ Increasing realization that climate change is a global security issue with potential to lead to social unrest, forced migration and displacement; important driver for international multilateralism, cooperation and ambition.</p> <p>→ promote social changes that lead to resilient governance systems, anchored in diversity, cooperation, social learning, and co-management, bolstering mitigation, adaptation, collective action and quality of life.</p>		<p>(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo</p>	
Good environment stewardship practices are dynamic	<p>Both at sea and on land, adopting dynamic approaches to conservation, rather than static goals, will allow flexible responses and leverage biodiversity's capacity to contribute to climate change mitigation and adaptation. In face of climate change, conservation will be about managing the change, since a return to the historical state will be impossible to achieve.</p>		<p>(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo</p>	

Appendix II*

Additional information submitted by France: *Contribution from France*

France would like to thank the IPBES secretariat for this opportunity to submit suggestions for thematic or methodological issues related to biodiversity and climate change, which would benefit from collaboration between the IPCC and IPBES. Establishing relevant modalities for a sustained collaboration between both organizations is of paramount importance, and we welcome the ongoing efforts and discussions within IPBES to advocate for this issue.

France would like to suggest **one thematic issue** relating to synergies and tradeoffs between clean energy and biodiversity protection as well as **one methodological issue** on developing joint scenarios for IPBES & IPCC, including social aspects, multiple spatial and temporal scales and regime shifts.

[THEMATIC] How to reconcile the production of "clean" energy (low CO₂) with biodiversity conservation to achieve climate mitigation and stopping biodiversity loss objectives?

Thanks to the IPCC, the world has realized that the use of fossil fuel needs to be reduced to minimize climate change. It is of upmost importance to ensure that the replacement energy does not endanger biodiversity. The concept of 'renewable' or 'clean' energy will need to be defined, notably in light of biodiversity protection and sustainable use. Biomass burning (e.g. peat, wood) can be especially destructive, and hydroelectric plants can both disrupt the functioning of aquatic ecosystems and cause extensive loss of natural habitats and trigger large methane emissions. Likewise, supply chains of materials used in low emissions technologies (such as rare earths for wind farms' permanent magnets) are often associated with biodiversity impacts. An assessment to identify the risks of collateral damage to biodiversity and to find ways to mitigate or to avoid them (including decrease in energy consumption) is needed. Moreover, renewable energies require materials derived from biodiversity or likely to cause environmental damage (e.g. balsa wood for wind energy, rare earths for solar energy). The biodiversity-energy nexus should therefore be analyzed from a life-cycle analysis perspective and take a wide range of co-benefits and adverse effects into account (including induced impacts). Such work would further support the integration of biodiversity concerns in climate research and policy.

The dramatic shift to renewable energies that is required to keep global warming within 2°C would lead to significant land- and sea-use changes, with competing uses between energy and food production and the protection of wild areas. The IPBES Global Assessment Report and the upcoming assessment of the sustainable use of wild species (for biomass energy) are tackling this issue in some more details. Given the current pace of development and implementation of renewable energy, significant attention should be given to this topic to support policymaking in several sectors, including energy, transportation, agriculture and biodiversity. The IPCC should be involved in supporting the preparation of the IPBES 'nexus' assessment in the upcoming IPCC assessment cycle. Policy wise, this would support the implementation of regional and national policies, such as the European biodiversity strategy for 2030, which calls for "win-win solutions for energy production", is also looking at how to be self-sufficient in energy production. Solutions based on biodiversity (such as nature-based solutions as described in the UNEA5 resolution) that generates long-term outcomes for both biodiversity protection and climate change adaptation and mitigation, should also be analyzed and promoted.

[METHODOLOGIC] Developing joint scenarios for IPBES & IPCC, including social aspects, multiple spatial and temporal scales and regime shifts.

This area of work would be useful for both IPBES and IPCC since it has been acknowledged by both climate and biodiversity communities that current global scenarios are largely looking into climate change parameters (CO₂ emissions and temperature) but hardly integrating biodiversity change parameters. Current scenarios used by IPBES and IPCC lack consideration of the interplay and feedback loops between biodiversity loss, climate change, land- and sea-use change, exploitation/management strategies, pollution and invasive alien species, including what the consequences of and for the

* The appendix has not been formally edited.

redistribution of species communities and ecosystem functioning are. A methodological work, supported by a review of existing scenarios at various scales looking into the interplay of those drivers, taking into consideration social aspects (including economy, public policies and governance), would be very valuable and useful for future thematic assessments. It could explore ways to harmonize spatial and temporal scales of the diversity of scenarios used both in climate and in biodiversity research. Intergovernmental platforms could further support policy-making by providing support down to national scales. Working on different scales could also enable better understanding of the wide range of potential biodiversity responses to a set of climate data. Working on temporal scales is a good entry point for interdisciplinary work, in order to understand the key issues for different stakeholders, over a short- to long-time horizon. Looking at medium- to long-term horizons, adaptation assessment of biodiversity would also be key to enable synergies with the ongoing work on biodiversity and climate change scenarios.

Appendix III*

Additional information submitted by Japan: *Japan's comments in response to "Call for suggestions for issues related to biodiversity and climate change which would benefit from collaboration between IPCC and IPBES"*

Overall Comments:

There are areas where collaboration with IPBES is needed, both in terms of topics related to IPCC WGII (Impacts, Adaptation, and Vulnerability) as well as those related to WGIII (Mitigation of Climate Change).

The followings are the areas that have possibilities of collaboration in terms of research and policies.

1 Collaboration on the relationship between climate change measures and biodiversity conservation measures

It is still needed to understand the relationship between climate change measures and biodiversity conservation measures, through quantitative and qualitative analysis, for practical conservation policy-making. For instance, in the discussion on the post-2020 global biodiversity framework under the Convention on Biological Diversity, it was proposed as Target 8 to “minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 GtCO₂e per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity”. However, considering feasibility etc., many parties to the convention were reluctant to support the quantitative part of the target proposal. Furthermore, in the discussion, the parties came up with few headline indicator proposals that measure impacts of climate change on biodiversity and progress of related measures against such impacts. Thus, there is room to investigate quantitative target proposal and related indicators which many parties can support and realistically implement (monitor), for 2030 and onwards, in this context (of climate change and biodiversity conservation).

Reference:

- Comparative study of representative models between IPBES-IPCC.

Bending the curve of terrestrial biodiversity needs an integrated strategy

<https://www.nature.com/articles/s41586-020-2705-y>

<http://www.ritsumei.ac.jp/news/detail/?id=1839>

https://www.wwf.or.jp/activities/data/lpr20_04.pdf

- Research on climate change measures and their impact on biodiversity.

Biodiversity can benefit from climate stabilization despite adverse side effects of land-based mitigation.

<https://www.nature.com/articles/s41467-019-13241-y>

<https://www.kyoto-u.ac.jp/ja/research-news/2019-12-04>

- Land-based implications of early climate actions without global net-negative emissions

<https://www.nature.com/articles/s41893-021-00772-w>

http://www.ritsumei.ac.jp/profile/pressrelease_detail/?id=526

- Biodiversity-productivity relationships are key to nature-based climate solutions

<https://www.ynu.ac.jp/hus/koho/26453/detail.html>

https://www.nature.com/articles/s41558-021-01062-1.epdf?sharing_token=nC-wVMmDSKHzVP6yFQA6BdRgN0jAjWeI9jnR3ZoTv0NdGO4foWsVErgKV-Y8OuMA7xd3ul2V8M4z9i1ROM6Bukgc_OP07Ro8H-ysw2h2H6Lh-ro-nsimQ93do6STBtajkh3D0lZcC1-wU6kvoLJh5iWpvIGkKCsq8aDEMR4Jk%3D

2 More specific areas and/or issues
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(1) Collaboration in the urban context

UN DESA shows that 68% of the world population is projected to live in urban areas by 2050. IPCC AR6 WGII and WGIII have discussed urban issues from both adaptation and mitigation perspectives.

* The appendix has not been formally edited.

In the AR7 cycle, IPCC will publish a special report on climate change and cities. Discussions on nature-based solutions in urban areas are also becoming increasingly important. Many urban studies have been conducted in the context of climate change, but it is also becoming important to discuss from the biodiversity aspect.

(2) Collaboration on the soil issues

There is a need for both IPCC and IPBES to do an assessment regarding soil biodiversity such as by discussing based on the FAO's reports on soil biodiversity.

Soil biodiversity <https://www.fao.org/soils-portal/soil-biodiversity/en/>

Keep soil alive, protect soil biodiversity <https://www.fao.org/documents/card/en/c/cb6005en>

FAO shows that "there is convincing scientific evidence that the loss of soil biodiversity and its habitats poses a global threat to food security and food safety, nutrition and human health, biological control of pests and diseases (more than ever during the global pandemic), climate change mitigation/adaptation, nature-based solutions, (re-)emergence of zoonotic diseases and life on earth."

Soil biodiversity issues are also important, considering the large emissions from the agriculture and food industry.

FAO presented a new database to track carbon emissions from agri-food systems around the world. The new data found that 31 percent of total anthropogenic GHG emissions, or 16.5 billion tonnes, originate from the world's agri-food systems.

<https://www.fao.org/newsroom/detail/supply-chain-is-growing-source-of-agri-food-GHG-emissions/en>

(3) Development of common land-use scenario

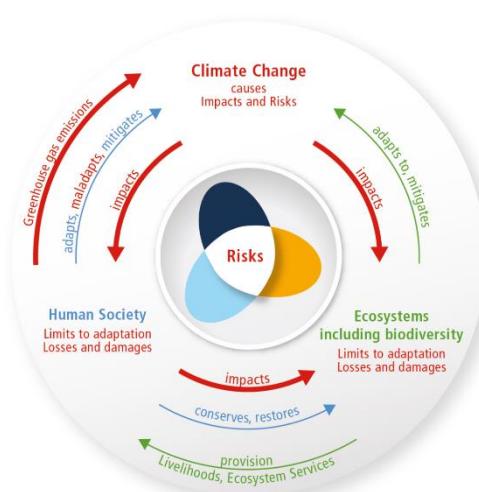
Land use is a common factor between global warming mitigation options such as afforestation and reduced deforestation and forest degradation (REDD) and biodiversity conservation. Moreover, land use should be taken into account by nexus assessments such as interactions among bioenergy crop cultivation, food production, and water resource conservation. At present, global warming studies like IPCC assessments use a land use scenario projected on the basis of socioeconomic scenarios (SSPs, Shared Socioeconomic Pathways). The scenarios were originally developed for climate change studies but has been applied to assessments of the impact on biodiversity. However, the scenario data give future projections of cropland extent for the whole land area but have several serious limitations. Namely, the scenario does not cover a range of possible future conditions and contain insufficient number of variables for biodiversity and ecosystem service assessments. Therefore, developing a new set of scenarios which are commonly applicable to IPCC and IPBES assessments is apparently effective for our future works. Previous scenarios used for IPCC assessments have a spatial resolution of about 0.25 degree in latitude and longitude, but it is insufficient for IPBES assessments putting more focus on local phenomena. Also, in addition to cropland and forest fractions, more variables should be included into the scenarios, such as information on ecosystem management and conservation and land objects such as roads and canals that affects natural habitats. By developing such new scenarios, it is expected to make substantial contributions to more effective environmental solutions (especially, Nature-based Solutions) which reconcile climate change mitigation and biodiversity conservation. Therefore, we recommend to promote development of a new, long-term, spatially explicit land use scenarios through intimate collaborations between IPCC and IPBES assessment participants, in conjunction with researchers of socioeconomic (integrated assessment) models.

(4) Sharing and standardization of research tools

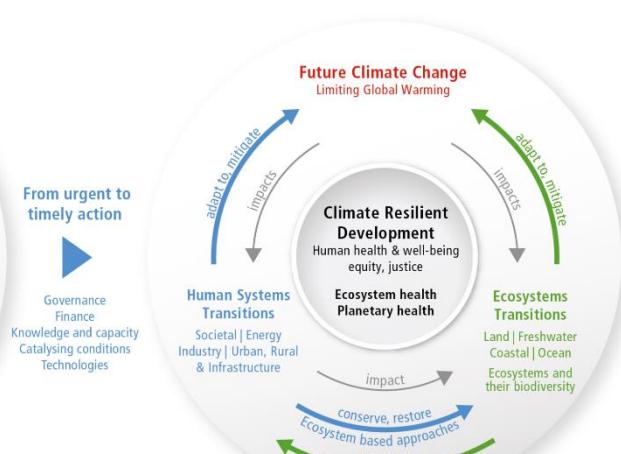
Summary for policy maker of the IPCC AR6 WGII shows a diagram summarizing interactions among climate change, human society, and ecosystems including biodiversity (cf. figure below). However, the interactions shown by arrows in the figure were obtained by individual studies, and then assessment tools were not standardized. It is expected that standardization of research tools (e.g., models, scenarios, statistic metrics) through research communities allows us to conduct assessments providing outcomes useful for environmental policies and solutions. Therefore, through collaborative works of IPCC and IPBES, we recommend starting discussion about sharing and standardization of research tools for assessments of the climate–society–ecosystem interactions.

From climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems

(a) Main interactions and trends



(b) Options to reduce climate risks and establish resilience



The risk propeller shows that risk emerges from the overlap of:

- Climate hazard(s)
 - Vulnerability
 - Exposure
- ...of human systems, ecosystems and their biodiversity

Figure: from summary for policy makers of the IPCC AR6 WGII.

Appendix IV*

Additional information submitted by Canada: Cooperative work between IPBES and IPCC: Canadian input

In keeping with decision [IPBES-8/1](#) (section II, para 10), IPBES members are have been invited to submit suggestions for thematic or methodological issues related to biodiversity and climate change that would benefit from collaboration between IPBES and IPCC ([EM/2022/10](#)).

Collaborative work presents an opportunity to broaden the expertise brought to bear on the interlinked issues of biodiversity and climate change, and also to avoid the duplication of work. Nonetheless, collaborative work must respect the structure of each organization. IPCC is completing its 6th cycle, and considerations of work to be undertaken in its 7th cycle will not be undertaken until the fall: in this context, the ability of the IPCC working groups to provide scientific input will be limited for some time to come.

An IPBES-led project with contributions from scientific experts who have contributed to the IPCC AR6 assessment cycle or will contribute to the AR7 assessment cycle can be undertaken more readily than formal collaborative work. Such an approach avoids the need for lengthy processes such as parallel decisions in both bodies or the establishment of a new liaison body.

Such a project is already underway: Climate change is interwoven among the considerations to be included within the Nexus assessment, and this provides an opportunity to engage more fully with IPCC authors and experts. Nexus coordinating lead authors are already reaching out to IPCC experts in an ad hoc manner. This outreach could be formalized by inviting the IPCC Secretariat to extend an invitation to the IPCC community at large to engage as contributing authors and reviewers.

As IPCC begins to consider work to be undertaken in its 7th cycle, it should be made aware of the status of work on the Nexus assessment, so that it may use the Nexus assessment as input in its own assessments and so that it may avoid the duplication of work. This could include presentations by Nexus authors to the IPCC. Such a decision at IPBES-9 should also include formal direction to Nexus authors to take into consideration the relevant findings of the reports from the 6th cycle of the IPCC: while this is implicit in paragraph 15 of the scoping document, there is value in highlighting the importance of the IPCC findings and their strong linkages to biodiversity.

The 2021 joint workshop produced a scientifically valuable document, and this format could potentially be used to address specific areas of work, with the caveat that workshop outputs should be presented clearly as scientific papers, without IPBES or IPCC branding that has the potential to create an impression that these products are similar to assessments or that they were formally endorsed in some manner by these organizations. (Most users will not be aware of the distinction between an assessment which has undergone multiple rounds of expert review, including government review, and a supporting document which has not.) Instead, such papers could undergo peer review and be published in the scientific literature. They could be made available to assessment authors as preprints prior to publication.

Subjects for such workshops could include

- 1) Recommendations for shared definitions of key terms, which could then be independently reviewed and approved by each organization. Agreed definitions could be incorporated into a joint glossary.
- 2) Analysis of expected outcomes (climate, biodiversity and socioeconomic) of actions undertaken to address the ‘triple crisis’ of climate change, biodiversity loss, and pollution. Evidence is building that actions taken to address biodiversity are generally neutral or positive for climate, (eg. IPCC WGII assessment – Chapter 2, Shin et al 2022 <https://doi.org/10.1111/gcb.16109>), although the reverse may not be true for all climate mitigation activities. Given the need for rapid action to avoid further declines in the global life support system, rapid, responsive, adaptive management is a key element. Joint workshops could synthesize emerging evidence to allow adaptive management on rapid time scales.

* The appendix has not been formally edited.

Appendix V

Additional information submitted by the Netherlands: *Underpinning climate action to 1.5°C with biodiversity planetary boundaries: Priorities for aligning international governance in 2022 and beyond*

Underpinning climate action to 1.5°C with biodiversity planetary boundaries: Priorities for aligning international governance in 2022 and beyond

Memo for EU Expert group on cross-cutting issues – April 2022

Alexandra Deprez, Research Fellow International Climate Governance, IDDRI

Introduction

True climate mitigation ambition must be understood as reaching the Paris Agreement 1.5°C goal within biogeochemical and ecosystem planetary limits: i.e., in a way that helps reverse, rather than dangerously accelerate, the 6th mass extinction and biodiversity crisis. For this, we urgently need a paradigm shift away from viewing ‘nature’ simply as a ‘solution’ to climate, to a more comprehensive view underscoring both (i) that biodiversity and healthy natural ecosystems underpin and condition our ability to reach ambitious climate goals, and (ii) how ambitious up-front deep decarbonization is key to ensure biodiversity conservation into the future, and hence our ability to reach the 1.5°C goal.

Recent science indicates that the viable 1.5°C emission reduction pathways that do not overstep biogeochemical and ecosystem planetary boundaries may be much more limited than previously assessed in the IPCC 1.5°C Special Report, given that many recur to significant land-based carbon-dioxide removal (CDR) adding land-conversion at a time when we need unprecedented ecosystem conservation efforts. This reinforces the urgency of drastic emission cuts today as the best option if we want to maintain a living—and hence liveable—planet.

This Memo builds off recent scientific research from across the climate and biodiversity communities, IDDRI’s 2021 publications on aligning high climate and biodiversity ambitions and actions across international governance, and an analysis of what was achieved at COP26 on the climate-biodiversity nexus.¹ It highlights four key priorities in 2022 and beyond for better integrating high climate and biodiversity governance and action across: science, international governance (e.g., Rio Conventions), accountability of NSA and voluntary coalitions and commitments, and tackling tricky issues (e.g. bioenergy).

1. True climate mitigation ambition must be understood as reaching 1.5°C within biophysical and ecosystem planetary limits

Healthy and biodiverse ecosystems are our life support system, as well as a key carbon sink (absorbing over half of our carbon emissions over the last decade) – undermining these ecosystems may actually put at risk our ability to reach the 1.5°C goal, and vice versa, climate change threatens the ability of ecosystems to act as carbon sinks and risks turning them into sources of emissions.² Recent IPCC and IPBES Reports have been increasingly clear that we need an integrated response between the climate and biodiversity crises. Yet a full translation of this integrated approach into climate modelling (e.g., IPCC WGIII) and governance is still pending.

Preserving ecosystems and halting biodiversity loss requires not only unprecedented efforts of ecosystem conservation, restoration, and sustainable management today (which is where most focus is

¹ See: Deprez, A., et al (April 2021) “Aligning high climate and biodiversity ambitions in 2021 and beyond: why, what, and how?”, IDDRI Study; Deprez, A. et al (November 2021), “Aligning climate action to 1.5°C with biodiversity planetary boundaries: Three key priorities at COP26 and beyond,” IDDRI Policy Brief; Deprez, A. (December 2021) “Building off COP26: Delivering on 1.5°C and ‘net zero integrity’ through integrated climate and biodiversity action”, IDDRI blog post

² IPCC, AR6, WGI

placed today), but also ensuring ecosystems are preserved into the future, which requires reducing land-use conversion pressures and keeping them low throughout coming decades.³

Yet concerningly, a 2021 study for instance finds that 97% of pathways assessed by the IPCC to reach 1.5°C (or even 2°C) goal depend on bioenergy (to replace fossil-fuels) and bioenergy with carbon capture and storage BECCS (used as CDR) at scales leading to further land-use conversion, overstepping what the authors call a ‘precautionary sustainability threshold’ of bioenergy crop production (0.5 M km² –the current level).⁴

The study also finds that 33% of IPCC 1.5°C or 2°C pathways bank on 5 Gt/CO₂/yr removals by BECCS by 2050⁵ (requiring bioenergy crops on an area at least twice Argentina) or above, significantly trespassing the upper sustainability threshold that the IPCC-IPBES Co-Sponsored Workshop Report (2021) sets out: 1 to 2.5 Gt/CO₂/yr.

Scientists caution that “large-scale BECCS and its associated land use would likely steer the earth system closer to or beyond planetary boundaries associated with freshwater use, biosphere integrity, and biochemical flows.”⁶ Even smaller bioenergy expansion promises to have severe negative biodiversity consequences: some studies have found that 50% of the best bioenergy growing land is located in biodiversity hotspots,⁷ with Central and South America, Africa, and Southeast Asia most at risk for increased land-use conversion and conflicts.⁸

The IPCC 1.5°C Special Report clearly states that only through rapid and deep economy-wide decarbonization (including scaling-up demand side measures) can we reach the 1.5°C goal with minimal use of CDR (and little or no BECCS). The recent science highlighted above thus indicates that without significantly accelerating deep emission cuts today, we may be precisely locking ourselves into emission reduction pathways that to reach the 1.5°C would require unviable deployment of bioenergy, BECCS or other CDR with large land-footprints (e.g., removing 1Gt/CO₂/yr through afforestation would require planting trees on an area twice the size of California).⁹

At the same time, overly positive narratives around the role of ‘Nature’ as a ‘Solution’ have overpromised the size of the sink that nature conservation, regeneration and managed ecosystems can provide, and therefore their role in mitigation. Taking into account implementation and biogeochemical constraints, new research estimates the sequestration potential of ‘natural’ CDR (e.g. reforestation, improved forest management and soil carbon sequestration) at 100-200 Gt/CO₂ to 2100, significantly lower than previous assessments (up to 800 Gt/CO₂).¹⁰ This research therefore points to the importance of halting further ecosystem loss (especially of carbon rich ecosystems) to preserve the natural land carbon sink and avoid increased LULUCF emissions.

Clarifying the role of ecosystems in reaching 1.5°C is fundamental to the climate ambition discussion, and effective and coherent climate governance. Fully integrating biodiversity and ecosystems into the climate discussion reinforces the current call for upfront ambitious mitigation with an additional scientific urgency. It:

- i. Underscores that to keep the 1.5°C goal in reach we need urgent action on both (i) deep decarbonization (fossil fuel phaseout, and scaling-up demand side measures—which are a key

³ Land-use conversion is the first driver of biodiversity loss (IPBES GAR, 2019).

⁴ Creutzig, F. et al (2021) Considering sustainability thresholds for BECCS in IPCC and biodiversity assessments. GCB Bioenergy.

⁵ Ibid.

⁶ Ibid, based on Heck, V. et al (2018) Biomass-based negative emissions difficult to reconcile with planetary boundaries. Nature Climate Change,

⁷ Santangeli, A., et al. (2016). Global change synergies and trade-offs between renewable energy and biodiversity. GCB Bioenergy, 8(5),

⁸ Hof, C., et al. (2018). Bioenergy cropland expansion may offset positive effects of climate change mitigation for global vertebrate diversity. PNAS

⁹ Nolan, C. J. et al (2021) Constraints and enablers for increasing carbon storage in the terrestrial biosphere, Nature

¹⁰ Ibid.

- win-win) and (ii) minimizing emissions from LULUCF, by preserving and restoring natural ecosystems, and scaling-up sustainable land use.¹¹
- ii. Reinforces the call to ensure accountability on our path towards the collective mid-century net zero goal. Parties' plans towards their mid-century net zero goals must clearly prioritize the 'Zero' (deep emission cuts), and limit dependence on the 'Net' (limiting emissions compensations through CDR). This recent science therefore severely questions the compatibility with 1.5°C goal –accounting for biogeochemical and ecosystem planetary boundaries–of net zero announcements and plans that bank on large-scale compensation.

The above research leads to several open questions when reading the IPCC AR6 WGIII Report and SPM published today: does the Report and the integrated assessment models that underpin it:

- Heed to the full extent the cautions in the IPCC AR6 WGII Report on the importance of frontloading mitigation to minimize impacts on ecosystems, and enable better adaptation?
- Take up and detail further the issues raised in the IPCC 1.5°C SR and IPCC SR Land, the IPCC-IPBES Joint Workshop Report, and the above recent science on 'ecological limits' for bioenergy, BECCS and other land-based CDR?
- Present only net zero scenarios that keep to these 'sustainability thresholds', or still present scenarios with large-scale CDR including BECCS, without detailing out explicitly and clearly the underpinning assumptions of large land-use required, which may compromise biodiversity and food security?
- Explore to the full extent possible demand-side measures such as energy demand reduction, dietary shifts, etc.?

2. The continued importance of broadening narratives on climate & biodiversity linkages

Current climate ambition narratives integrate only partially (if at all) the exact role that preserving healthy ecosystems now and into the future plays in our ability to reach the 1.5°C goal. For those focused on mitigation ambition, biodiversity and ecosystems (often reduced as – 'Nature') is still often viewed as one of multiple thematic buckets in the climate arena – a nice 'add on' – rather than as a key underpinning condition for reaching climate mitigation ambition, and for which it is therefore key to systematically integrate ambitious action on both fronts.

The High Ambition Coalition COP26 Leaders' Statement illustrated well this disconnect—in it, 27 heads of State call for ambitious mitigation towards 1.5°C, yet make no mention of the importance of conducting – in parallel to deep decarbonization – ambitious ecosystem conservation and sustainable land use.¹² This omission appeared highly incoherent as most of HAC signatory Parties champion biodiversity elsewhere: over half are members of the High Ambition Coalition for Nature and People, and two-thirds committed in the Leaders' Pledge for Nature to:

"Mainstreaming biodiversity [...] into those key international agreements and processes which hold levers for change, including the [...] UNFCCC [...] by ensuring that across the whole of government, policies, decisions and investments account for the value of nature and biodiversity, promote biodiversity conservation, restoration, sustainable use [...] we commit ourselves not simply to words, but to meaningful action and mutual accountability to address the planetary emergency."¹³

On the other hand, the overly positive narrative of those championing biodiversity (or 'nature') in the climate arena raises several yet unresolved challenges. In addition to overpromising 'Nature' as a mitigation solution (see Part 1), in using this overly positive narrative advocates omit or barely mention key trade-offs or contention points (e.g., bioenergy and land-based CDR), thereby failing to

¹¹ Continuing R&D on technological CDR measures such as 'DACCs' is also important, yet frontloading emission reductions during the 2020s is essential to safeguard against CDR's potential future failure of delivery. Grant, N. et al (2021), Confronting mitigation deterrence in low-carbon scenarios, Environmental Research Letters,

¹² High Ambition Coalition COP26 Leaders' Statement

¹³ Waring, B. There aren't enough trees in the world to offset society's carbon emissions – and there never will be, April 2021, The Conversation and Mackenzie, K. Big Oil's Net-Zero Plans Show the Hard Limits of Carbon Offsets, (March 2021), Bloomberg [https://theconversation.com/forests-cant-handle-all-the-netzero-emissions-plans-companies-and-countries-expect-nature-to-offset-too-much-carbon-170336](https://theconversation.com/forests-cant-handle-all-the-net-zero-emissions-plans-companies-and-countries-expect-nature-to-offset-too-much-carbon-170336)

systematically connect and underscore the importance of deep decarbonization today and scaling-up of demand side measures in order to protect ecosystems throughout coming decades. Furthermore, the Nature Based Solutions (NBS) approach gives the impression ecosystem approaches are low-hanging fruit for climate action, when the reality is more sobering up to date, despite decades of attempted international coordinated action ecosystem destruction continues and failed commitments abound from Parties and Non-State Actor (e.g., the CBD Aichi targets, and the 2014 New York Declaration on Forests, etc.). Finally, the above research also reinforces that ‘nature’ cannot be a substitute for ambitious emission reductions—dispelling the imaginary of a massive and untapped land potential available to offset large-scale fossil emissions, which many corporations are still banking on to reach their net zero goals.¹³

3. Priorities for better integrated governance and responses in 2022 and beyond

Aligning 1.5°C climate action with biophysical and biodiversity integrity requires serious, renewed action from political leaders, policymakers, scientists, corporations, and civil society. We see at least four key opportunities for jumpstarting operationalization of more coherent climate and biodiversity action in 2022 and beyond.¹⁴

3.1 Invite the IPCC and IPBES to author in AR7 a Special Report on climate and biodiversity linkages, namely to clarify the ecological limits of land-based CDR

The IPCC-IPBES 2021 co-sponsored workshop highlighted the need for integrated action, but as highlighted in Part 1, key issues remain and will likely continue to remain unanswered by the IPCC AR6 WGIII Report. A joint IPCC-IPBES Special Report would have a critical role to play in informing and helping guide Parties’ and NSA’s climate mitigation commitments and planning to be aligned with the 1.5°C goal within ecosystem planetary limits. This namely by clarifying the scope of viable 1.5°C emission reduction pathways, given indications that land-based CDR at large (or even ‘moderate’) deployment promises severe negative impacts on biodiversity, or risks even surpassing biogeochemical planetary boundaries. Such a report would have been a key input into the 2023 Global Stocktake, helping Parties assess collective progress to the Paris Agreement’s long-term goals keeping within ecosystem planetary limits. Yet a more realistic timeline is starting in 2023 at the launch of AR7—delivered by mid-decade, this Report would remain highly valuable. At the AR7 scoping session (beginning of 2024) Parties can call the IPCC to take on this Special Report.

Three key issues that previous IPCC Reports and the IPCC-IPBES CSWR have not yet fully assessed, and which should therefore be central to a joint climate-biodiversity Special Report are:

- i. Further assess sustainability thresholds for bioenergy (with and without CCS) and other land-based CDR and mitigation measures (e.g., afforestation);
- ii. Detail out the biodiversity, land-use conversion and food security impacts of different 1.5°C mitigation pathways;
- iii. Assess and develop sustainability pathways that reach both the 1.5°C goal while keeping within biogeochemical and ecosystem planetary boundaries and ensuring other Sustainable Development Goals (e.g., food security) can be met.

But already in 2022, in the follow-up to the IPCC AR6 WGIII publication and AR6 Synthesis Report, further elevating politically the need for clarifying the ‘sustainability thresholds’ of land-based CDR and the role of ecosystem conservation will be key to help shift the political narrative on integrating ‘nature’ within climate action.

3.2 Operationalize intelligent and incisive alignment within and across Rio Conventions

At COP26, the final Glasgow Pact included strong language – the most extensive to date in a UNFCCC COP final decision – on the need to address climate change and biodiversity conservation

¹⁴ Elsewhere, we and others have presented a menu of options for better integrating climate and biodiversity action at COP26 and beyond. E.g., Deprez, A., et al (2021) “Aligning high climate and biodiversity ambitions in 2021 and beyond: why, what, and how?,” IDDRI Study

in an integrated manner.¹⁵ This both anchors politically the need for an integrated response, and offers legal hooks to operationalize further climate-biodiversity coherence within the UNFCCC bodies in coming years. Yet it was striking to see that in the run-up to, and at COP26, beyond this push for a high-level political declaration, there seemed to be little appetite (from Parties, the UK COP26 Presidency, and even to some extent from civil society) to operationalize further a better integration of climate-biodiversity linkages within the UNFCCC or across the Rio Conventions.

While creating better institutional coherence within the UNFCCC and across Rio Conventions may not seem as immediately ‘impactful’ as the ‘Real Economy’ deals that were for instance announced at COP26, it seems still essential to us to continue advancing intelligent and incisive alignment. Indeed, while the ‘impact chain’ might seem less direct than the ‘real economy’ deals, the framing taken within and across the UN Rio Conventions does provide terms of reference of the debate, that help to shape the broader discussion: two clear examples in the climate sphere are the prominence the 1.5°C goal and the Net Zero concept, both of which were introduced in the Paris Agreement. Thus, getting Parties to discuss formally within for instance the SBI and SBSTA on issues at the climate-biodiversity nexus could play a role of over time in better integrating these two issues beyond the UN arenas.

An open question remains on the most effective ways to bring about this integration. Our 2021 IDDRI Study¹⁶ highlights key principles for improving alignment across UN Rio Conventions – with a specific focus on the UNFCCC and CBD – (see Annex), as well as specific governance options, a couple of which are synthesised in Table 1, and which remain relevant in the run-up to COP27 and beyond. A key insight from our research since 2020 is that improving alignment across UN Rio Conventions should not be understood as an aim in itself – as this risks leading to creating institutional links that are inoperant (e.g. the Rio Conventions’ ‘Joint Liaison Group’)¹⁷ – but should be oriented fully to improve better integrated implementation at the national level, and to catalyze reaching high ambition goals across climate, biodiversity and desertification issues. At the same time, prompting better integration within international governance arenas can play a role in incentivizing more harmonization on the ground. Given the difference in ‘maturity’ between the different governance regimes (especially the UNFCCC and CBD), a particularly impactful avenue at present for Parties to the UNFCCC may be to ‘mainstream’ or operationalize biodiversity within the UNFCCC. COP27, with its focus on agriculture and the Koronivia process can provide key opportunities. It will also be essential that the Global Stocktake moment (with both the formal process and the informal process around it) place a key emphasis on the ‘integrity’ of Net Zero commitments, a part of which includes ensuring that collectively Parties (and NSA) are maximizing emission reductions in order to limit future dependence on (land-based) CDR.

Broadly speaking, the ‘cautious role’ for CDR raises the need for improved accountability and governance in order to deliver ‘net zero integrity’ up to the Global Stocktake. One governance idea that could be explored at different levels (UNFCCC, CNC, Race to Zero, etc.) could be to have

¹⁵ The final Glasgow Pact Decisions (1/CP.26 and 1/CMA.3): (i) note the importance of ensuring the integrity of all ecosystems and biodiversity conservation, and reiterate that the global climate and biodiversity loss crises are interlinked, (ii) explicitly recognize the importance of protecting, conserving, and restoring ecosystems to achieve the Convention’s long-term global goal and the Paris Agreement’s temperature goal “by acting as sinks and reservoirs of greenhouse gases and protecting biodiversity, while ensuring social and environmental safeguards,” (iii) encourage Parties to take an integrated approach on ecosystems in national policies, and (iv) establish a recurring dialogue on the ocean-climate nexus.

¹⁶ Deprez, A., et al (2021) “Aligning high climate and biodiversity ambitions in 2021 and beyond: why, what, and how?”, IDDRI Study.

¹⁷ The JLG was created in 2001 at the behest of the Rio Convention Executive Secretaries. The JLG represents a valuable and laudable effort to create synergies and links between the Rio Conventions, and future alignment efforts should include thinking through how to make the JLG most valuable (while at the same time being realistic of what it can deliver). However, these links appear to have been taken up only intermittently by the COP decision bodies, and with annual meetings halted since 2016, the JLG appears to be currently dormant. In 2017, the three Rio Convention Executive Secretaries made an official proposal for a “Project Preparation Facility (PPF): to increase financing for large-scale, transformative projects which integrate action on land degradation, biodiversity loss, and global warming”, which appears to have never been taken up by Parties. This indicates that despite all the good-will of the Secretariats, there is only so much they can do without proper Party buy-in. See: “UN Heads call for assistance to address linked climate change, biodiversity and desertification threats” <https://www.unccd.int/news-events/un-heads-call-assistance-address-linked-climate-change-biodiversity-and-desertification>

separate ambitious mitigation targets and a separate removal capped target (e.g., drawing inspiration from the EU or some EU-member state commitments).

Table 1. Options of how to improve climate and biodiversity alignment

Where? / How ?	Within the UNFCCC & CBD Processes	Outside
Building national coherence	SBSTA-SBSTTA joint work on climate-biodiversity synergies and tradeoffs, especially CDR-bioenergy SBIs joint development of guidelines for NDC-NBSAPs harmonization, including bioenergy safeguards	Domestic efforts to create greater coherence between national climate and biodiversity policymaking and planning, and between negotiating teams.
Aligning ambitions and actions at the international level	Global Goals: Climate target in the Global Biodiversity Framework (GBF). Accountability: (1) Harmonizing transparency frameworks under the Paris Agreement and GBF, (2) Paris Agreement Global Stocktake: a moment to ensure we are truly on path to 'net-zero nature positive'—i.e., on 1.5°C emission pathways that do not recur to excessive land-based CDR Research: Joint IPCC-IPBES work feeds into UNFCCC-CBD Finance: Biodiversity safeguards in Paris Agreement Article 6 (carbon markets) New governance issues - CDR: UNFCCC and CBD Subsidiary Bodies launch joint work on CDR and bioenergy (namely clarifies the incompatibility of 1.5°C emission pathways using very large-scale CDR with reaching biodiversity goals)	Accountability: (1) The SDG process HLPF as a forum for additional accountability. (2) Civil society demands greater collective climate-biodiversity coherence and accountability at COP15-COP26, and in the run up to Global Stocktake (i.e., through IGST) Research: Greater development of joint research by climate and biodiversity scientific communities, to close gaps. Finance: Role of DFIs, and biodiversity safeguards for voluntary carbon markets, to avoid 'tree-washing' (overly focus on offsetting). New governance issues – CDR: Bring this issue to other arenas where it can be also governed, including the Committee on World Food Security

Another promising area for greater integration is LT-LEDS (Long-Term Low Emission Development Strategies). LT-LEDS are a key tool to help Parties reach the Paris Agreement's long-term goals, in the context of sustainable development, and are being increasingly used by Parties to detail out plans that underpin and build trust in the realism of their net zero announcements. Using LT-LEDS a tool to explore low-emissions planning aligned with biodiversity and ecosystem integrity would enable Parties to:

- i. Map, anticipate and avoid trade-offs up to 2050, and avoid getting locked-in to pathways incompatible with reaching climate, biodiversity and sustainable development goals (e.g. risk that extensive land-based CDR exacerbates land-use conflict and human-rights abuses, food insecurity, etc.);
- ii. Inform more integrated and coherent climate and biodiversity policymaking (e.g. to be reflected in NDCs and NBSAPS);
- iii. Attract finance from Development Banks who are increasingly mainstreaming SDG alignment, and halting funding to harmful practices,¹⁸
- iv. Improve Parties' ability to deliver a low-emissions pathway that is most in line with the 1.5°C goal in the context of planetary boundaries. This integration is also key in the run-up to the Global Stocktake, helping assess progress towards the Paris Agreement long-term goals in the context of broader ecosystem planetary boundaries.

The Climate Neutrality Coalition offers one arena in which to approach these issues.

3.3 Accountability of NSA Net Zero commitments

COP26 saw the announcement of extensive 'real economy' deals on the climate-biodiversity nexus, in line with the UK COP26 Presidency's 'Nature' Campaign. Several 'near negotiation' deals were reached, and coalitions announced, sometimes bringing together private and public actors, with the Glasgow Leaders' Declaration on Forests and Land Use taking a lot of headlines given its scale (endorsed by 141 countries, covering around 90% of global forest) and the significant associated public and private finance pledged (\$12 billion and \$7.2 billion respectively). However, concerns were raised on (i) the good will of key Parties that committed to the deal, most notably Brazil, whose government withheld until after COP26 data already available in October on soaring Amazon deforestation (up 22% in 2021 from 2020 levels),¹⁹ (ii) whether the non-legally binding Glasgow Forest Deal has enough 'teeth' (despite the significant associated new finance) to be well

¹⁸ Riaño, M.A. et al. (2021), Financing the 2030 Agenda: an SDG alignment framework for Public Development Banks, ETTG

¹⁹ <https://apnews.com/article/climate-caribbean-environment-brazil-jair-bolsonaro-064dbb71f958ed42aac8ad1c932272fb>

implemented, given the fact that the precedent 2014 non-binding New York Declaration on Forests to half deforestation by 2020, failed to even slow down deforestation.²⁰

The ‘near negotiation’ coalitions and announcements of COP26 make even more pressing the question – a question relevant since 2015 and the COP21 Action Agenda, but still not fully answered – of how to keep accountable the Parties and NSA who take on these voluntary commitments. Related to this is:

- i. The priority of keeping Non-State Actors more generally accountable to their own Net Zero and decarbonization voluntary commitments, namely the role they place on the ‘Zero’ vs. the ‘Net’ (carbon offsets, CDR): the UNSG Group of Experts and the 3rd annual Race to Zero Criteria Consultation represent two areas of action but open questions also remain on how effectual these will be; and
- ii. The broader question of an implementation of Article 6 in line with environmental integrity and reaching the 1.5°C goal.

3.4 Tackling tricky issues: wood-based biomass for energy

Parties missed at least one opportunity in the Glasgow Pact and at COP26 more generally to promote a more integrated climate and biodiversity approach. They failed to recognize the importance that mitigation policy does not severely compromise biodiversity conservation. To the contrary, the COP26 Decision’s wording “phasing out unabated coal”, appears to leave the door to promoting wood-based biomass and coal co-firing—even as scientists have repeatedly warned – namely in a letter of over 500 scientists to Biden, von der Leyen and other leaders – that replacing coal with the burning of trees (i.e. wood-based biomass) can severely exacerbate biodiversity loss and has questionable climate-neutrality claims.²¹ The 2021 G20 Statement also explicitly mentioned bioenergy as a ‘renewable’ energy that States should collaborate on up-scaling, but without detailing any biodiversity or other sustainability safeguards.

It therefore seems important for Parties to address frontally, in 2022 and beyond, the concerns and potential risks that a massive shift towards wood-based biomass represents in undermining climate and biodiversity goals; and develop strong environment safeguards for practices such as bioenergy. In 2022, the German G7, Indonesian G20, and Stockholm+50 could all be key arenas to tackle these tricky issues—which will only continue rising in importance in the run-up to the Global Stocktake. At COP27 Parties can operationalize the Glasgow Pact by developing environmental and social safeguards to ensure coherent implementation of climate and biodiversity policies. The issue of bioenergy would also be a pertinent issue for UNFCCC Parties to tackle in an SBI-SBSTA joint work program. Yet given the vested interests of Parties viewing bioenergy as a renewable energy without shedding light on the risks, this tricky issue will likely continue to remain un-tackled. This especially in the absence of civil society pressure, which for the moment has not by and large shed a spotlight on the need to minimize the ‘trade-offs’ between climate and biodiversity action, but rather focused almost exclusively on maximizing the synergies (NBS, etc.).

4. Conclusion and some guiding questions

Thinking how to improve synergies across Rio Conventions provides a starting point for a broader reflection on how to best align and integrate climate and biodiversity governance towards high ambition outcomes. A couple of questions this raises specifically for EU member-state climate negotiators include – how can EU member-States:

- Best support more integrated science to help clarify the ‘sustainability thresholds’ of land-based CDR and help ensure that Parties and NSA collectively take on pathways towards collective mid-century net zero that maximize emissions and minimize future dependence on CDR? Can EU members collectively support the call for a joint IPCC-IPBES Special Report in AR7?
- Best align, within the UNFCCC, and in the political moment of COP27 (and in the run-up to the COP28 Global Stocktake), high climate and biodiversity ambitions, including operationalizing biodiversity across the UNFCCC and addressing trade-offs such as bioenergy?

²⁰ <https://www.bbc.com/news/science-environment-59088498>

²¹ <https://www.woodwellclimate.org/letter-regarding-use-of-forests-for-bioenergy/>

ANNEX:

**BOX 2. PROPOSED KEY GUIDING
PRINCIPLES FOR ALIGNING HIGH
CLIMATE AND BIODIVERSITY AMBITIONS
AND ACTIONS**

1. Aligning climate and biodiversity high ambitions: going above and beyond purely linking the two issues or governance realms. Growing efforts to link the two issues (e.g., IPCC-IPBES joint workshop on climate and biodiversity interlinkages) are a positive and necessary starting point. However, focusing on aligning *high ambitions* orients efforts towards what should be the ultimate objective: ensuring both climate and biodiversity goals are met, without one compromising the other. For example, at the international level, aligning climate and biodiversity high ambitions could be translated as ensuring that the goals of both the UNFCCC and Paris Agreement and those of the CBD and post-2020 GBF are met.

2. Operationalizing 'net-zero and biodiversity positive' ambition: emphasizing reciprocal integration in climate and biodiversity arenas: As demonstrated in Section 1.1, reciprocal integration of climate objectives and priorities into biodiversity governance, and vice versa, is key to align high ambitions without 'mandate overlap' between Conventions. In other words, the UNFCCC does not need to govern all the intricacies of the issues at the climate-biodiversity nexus, but could work with the CBD whose mandate it is to address biodiversity issues. This greater integration necessitates going beyond formal links between conventions at the level of Secretariats. There are nascent efforts in the direction of reciprocal integration, such as the UNFCCC COP25 Decision's recognition of the "need to address biodiversity loss and climate change in an integrated manner" (1.CP/25, paragraph 15), and the development of the term 'net-zero nature positive'. Yet there is a key need to go beyond, to ensure that 'net-zero nature positive' includes redefining climate ambition in a way that integrates fully biodiversity as, for instance: "limiting temperature rise to 1.5°C through emission reduction pathways that are biodiversity and food security compatible" (Deprez et al., 2019). A concrete consequence would be that the climate community single out those 1.5°C emission pathways that would have severe biodiversity impacts (e.g., IPCC 1.5°C P4 scenario with widespread BECCS deployment in Box 1), and exclude these from being considered as 'climate ambitious' or as a beneficial route for Parties to take collectively.

3. Maximizing synergies and minimizing trade-offs: taking a comprehensive approach. This stands as the most key and problematic blind spot in the current global discussions on linking climate and biodiversity, a large "elephant in the room". The need to link and address together climate and biodiversity has fortunately entered the international political mainstream (e.g., Beijing Call for Biodiversity Conservation and Climate Change, NBS Stream at the 2019 UNSG Climate Action Summit, the UK COP26 Presidency's

Nature Stream, High Ambition Coalition for Nature and People, Leader's Pledge for Nature, the post-2020 GBF's working climate goal, the Rio Conventions Summit set to be held in 2021, etc.). While these efforts are all laudable and well intentioned, in our view many still seem incomplete. As mentioned in Section 1.1, the framing is often primarily on maximizing synergies between climate and biodiversity (e.g., actions that benefit both issues, epitomized by NBS), while de-emphasizing or even not at all acknowledging the existence of potentially severe trade-offs between the two issues (e.g., climate mitigation or CDR measures such as large-scale bioenergy or BECCS use that have highly deleterious impacts on biodiversity). There is a need for greater focus on actively minimizing these trade-offs, namely by promoting ambitious climate mitigation up to 2030 to minimize reliance on land-based CDR.

4. Acting now and planning ahead: creating climate-biodiversity alignment in both short-term actions and long-term planning. This is a second (and related) key gap in the dominant approaches to the climate-biodiversity nexus: most actors focus only on the here and now (e.g., the need to maximize NBS), while failing to also take a long-term view. Yet focusing on mid-century action is a crucial part of the puzzle, as it is at this time scale that the major trade-offs between climate and biodiversity will be visible (c.f. Box 1 on biodiversity-(in)compatible climate pathways). Indeed, to truly maximize synergies and minimize trade-offs, it is necessary both to focus on the need for ambitious action on climate mitigation (including scaling-up NBS) up to 2030, but also to plan to reach mid-century goals. Ambitiously mitigating climate change in the coming decade is indeed key to reduce GHG emissions as drastically as possible in order to avoid needing to recur in the run-up to 2050 to large scale CDR to compensate for prior inaction (c.f. Box 1). In turn, long-term climate planning—i.e., countries' net-zero goals and plans to reach these goals—should demonstrate compatibility with biodiversity conservation and sustainable land and biodiversity use priorities. Concretely, this could mean that countries should be called upon to demonstrate how their chosen plans to reach net-zero emissions (which might include large-scale BECCS, etc.) minimize their impact on biodiversity, and are thereby truly 'net zero & nature positive'. In turn, the biodiversity community and those who advocate for NBS should concurrently call for upscaling NBS today and also for the need to ensure 'permanence' of ecosystem protection up to 2050. To this end, they should push for ambitious climate mitigation to 2030, in order to reduce dependence on large-scale CDR deployment up to 2050 (See Section 1.1).

5. Enabling greater domestic coherence and coordination: orienting all climate-biodiversity alignment efforts towards concrete on-the-ground implementation. This principle is paramount in our view. Improving countries' internal domestic climate and biodiversity

policymaking and implementation, and implementation of international treaties (e.g., Paris Agreement and UNFCCC, CBD) would go a long way to improving alignment of these issues at an international level (this is developed further in Section 3.1). Yet building better bridges between the UNFCCC and CBD, and between climate and biodiversity in other governance arenas (e.g., G7, G20) can play a key role in propelling and harmonizing these more coordinated climate-biodiversity responses at different governance levels, and help ensure COVID-19 recovery plans do not lock us into high-emission pathways which would have negative climate and biodiversity consequences. In other words, building better bridges between the UNFCCC and CBD is *not an end in and of itself*, but each 'bridge' must be oriented towards improving alignment of domestic climate and biodiversity action. The need for such an emphasis was already identified in 2011 by the Rio Conventions Joint Liaison Group (JLG) between the three Secretariats, which established it as the JLG's first guiding principle.¹

6. Prioritizing pragmatism over idealism: working from the current state of climate and biodiversity governance rather than aiming for full convergence. Given the urgent need to align climate and biodiversity ambitions and action in the next 10 years, it is key to privilege pragmatism and realism, by working with current governance regimes as they are and propose concrete ways to improve alignment. Bridges between the UNFCCC and CBD should be designed in such a way that they can be more widely embraced by Parties to each Convention or Agreement and readily implementable, all while also supporting greater climate and biodiversity alignment and ambition. For instance, the harmonization of policy instruments or reporting could be envisaged, joint work on cross-cutting science issues, or joint monitoring (see Section 3.1). To the contrary, ideas that are highly politically or legally unwieldy should be avoided, in particular that of 'merging' the Rio Conventions or their COPs. Such merging would be highly unpractical, due namely to: (1) the complexity of each international governance regime means such a radical convergence would take significant effort and time, which is lacking given the urgency needed for action, (2) it would likely gather strong opposition from many Parties, and may be legally too complex given that not all States are Party to the two Conventions.²

7. Aiming for durable transformation: viewing the 2021 climate and biodiversity 'super-year' not as an end point but a starting point for transformation over the coming decade. Given that both COP15 and COP26 are major COPs in their respective regimes, 2021 is viewed as a climate and biodiversity 'super-year' offering a key opportunity to build greater links between these two issues. However, while creating political links between COP15 and COP26 is of critical importance and in itself a challenging task, it is key that this does not lead these two COPs to be viewed as the end points of greater climate and biodiversity alignment within international governance. Rather, this 'super year' should be viewed as a *starting point* to concretely jumpstart the development of greater alignment of climate and biodiversity ambitions across all scales of governance and across all actors throughout the coming decade. Regarding improving links and coordination in international governance between the UNFCCC and CBD, it is key not to rush on what COP15 and COP26 can provide as 'joint' outcomes, but rather truly take a 'long-term horizon', for instance to launch approaches to improving coordination in concrete and operable ways (e.g., through joint UNFCCC SBSTA-CBD SBSTTA work on synergies and trade-offs, or joint SBI work on how to better coordinate planning, reporting, and accountability across Conventions).

8. Unleashing creativity and innovation: building upon alignment efforts to date but accelerating implementation. At the international level for instance, a number of efforts to further align action between climate and biodiversity governance have seen the day over the past years and decades. This includes the Joint Liaison Group (JLG) between the three Rio Convention Secretariats, which appears to have been dormant since 2016.³ There have also been intermittent discussions in the Conventions' different SBs (e.g., UNFCCC SBSTA discussion in 2004, catapulted by the JLG, and discussions in the CBD), yet these do not appear to have produced much concrete change. They seem strongly insufficient or inadequate in light of the need for greater coordinated climate and biodiversity action as called for by science.

¹ "As synergies and coordination can be best implemented at the national level, the JLG will primarily support Parties in the achievement of national level synergies and coordination among the Rio Conventions." Terms of Reference and Modus Operandi for the Joint Liaison Group between the Three Rio Conventions (2011).

² Significantly, the United States is not a Party to the CBD.

³ The JLG was created in 2001 at the behest of the Rio Convention Executive Secretaries. The JLG represents a valuable and laudable effort to create synergies and links between the Rio Conventions, and future alignment efforts should include thinking through how to make the JLG most valuable (while at the same time being realistic of what it can deliver). However, these links appear to have been taken up only intermittently by the COP decision bodies, and with annual meetings halted since 2016, the JLG appears to be currently dormant. In 2017, the three Rio Convention Executive Secretaries made an official proposal for a "Project Preparation Facility (PPF): to increase financing for large-scale, transformative projects which integrate action on land degradation, biodiversity loss, and global warming", which appears to have never been taken up by Parties. This indicates that despite all the good-will of the Secretariats, there is only so much they can do without proper Party buy-in. See: "UN Heads call for assistance to address linked climate change, biodiversity and desertification threats" <https://www.unccd.int/news-events/un-heads-call-assistance-address-linked-climate-change-biodiversity-and-desertification>