

**Intergovernmental Science-Policy
Platform on Biodiversity and
Ecosystem Services**Distr.: General
9 June 2023

English only

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

Bonn, Germany, 28 August–2 September 2023

Item 7 (b) of the provisional agenda*

**Assessing knowledge: engagement with the
Intergovernmental Panel on Climate Change****Compilation of further 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 6 of section II of decision IPBES-9/1, the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) welcomed the report on progress by the secretariat on engagement with the Intergovernmental Panel on Climate Change, set out in document IPBES/9/9, and took note of the compilation of suggestions for thematic or methodological issues related to biodiversity and climate change that would benefit from collaboration between the Intergovernmental Panel on Climate Change and IPBES, set out in document IPBES/9/INF/26.
2. In paragraph 7 of the same decision, the Plenary invited the national focal points of the Platform to engage with their Intergovernmental Panel on Climate Change counterparts to jointly consider potential means of increasing scientific cooperation and information sharing and improving understanding of relevant processes, procedures and workplans.
3. In paragraph 8 of the same decision, the Plenary recognized the limited number of submissions received and contained in the compilation of suggestions referred to in document IPBES/9/INF/26 and requested the Executive Secretary to issue a new call for contributions, compile them and present them for consideration by the Plenary at its tenth session.
4. In response to the request by the Plenary, the Executive Secretary, in notification EM/2022/49 of 19 December 2022, invited members to submit, by 24 February 2023, further suggestions for thematic or methodological issues related to biodiversity and climate change which would benefit from collaboration between the Intergovernmental Panel on Climate Change and IPBES. A compilation of the suggestions received is set out in the annex to the present note, which is presented

*IPBES/10/1.

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 appendix to the annex.

Annex*

Further suggestions from IPBES members for thematic or methodological issues related to biodiversity and climate change that would benefit from collaboration between the Intergovernmental Panel on Climate Change and IPBES

The table below reproduces without formal editing the suggestions received in response to the call issued by the Executive Secretary inviting members to submit by 24 February 2023 further suggestions for thematic or methodological issues related to biodiversity and climate change which would benefit from collaboration between IPCC and IPBES.

<i>Country</i>	<i>Suggestions</i>
Germany	<p><i>Germany requested that its submission from 2022, which was included in document IPBES/9/INF/26, be also included in the present compilation. The submission is reproduced in the appendix to this annex.</i></p> <p>We hereby submit our proposals as per the appendix to this document. 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.</p>
United States of America	<p>Several topics that might benefit from collaboration between IPBES and IPCC are 1) scenarios and models (i.e., include IPBES scenarios and models task force members at upcoming IPCC scenarios workshop and vice versa); and 2) working with Indigenous and local knowledge (ILK).</p>
European Union	<p>Suggestions from European Union for thematic or methodological issues related to biodiversity and climate change which would benefit from collaboration between IPCC and IPBES (in addition to our original submission included in document IPBES/9/INF/26):</p> <p>1) Meetings between the IPCC and IPBES secretariats should take place on a regular basis ahead of the respective sessions of the IPBES Plenary.</p> <p>2) Considering the time-consuming procedural issues concerning potential joint assessments and technical papers (see IPBES/8/6 and IPBES/9/INF/26), IPBES and IPCC should also collaborate on joint communication and outreach activities around key findings of their respective assessments and activities that concern the interlinkages between the biodiversity and climate change crises. The ongoing IPBES nexus assessment provides an excellent opportunity for this, given the critical role of climate change for the different nexus elements, and the role of biodiversity and nature-based solutions (NBS) to support climate change adaptation and mitigation. The EU would welcome a close cooperation between IPCC and IPBES on transformative change and all relevant social sciences and humanities aspects of the climate and biodiversity crises. Cooperation with the International Resource Panel (IRP) should be explicitly envisaged in those activities as IPCC, IPBES and the IRP do cover the relevant dimensions.</p> <p>3) Further dialogue and exchange should also be encouraged between the Chairs, Bureau members and national focal points (NFPs) for IPBES and IPCC. Here we note and welcome the informal meetings between IPBES and IPCC NFPs that have taken place already in the WEOG region.</p> <p>4) IPBES members may also want to consider inviting IPCC focal points to join (also virtually) their delegations for future IPBES Plenary sessions, where IPBES-IPCC collaboration or other relevant topics of mutual interest are discussed.</p>

*The annex has not been formally edited.

<i>Country</i>	<i>Suggestions</i>
	<p>5) Recognizing the need to step up science support to integrated biodiversity and climate policies at the EU and the international level, the EU is committed to fund a project under the Horizon Europe framework programme on “Reinforcing science policy support with IPBES and IPCC for better interconnected biodiversity and climate policies”. Among other things, the project is expected a) to increase the awareness and uptake of IPBES and IPCC findings; b) to enhance cooperation and synergies between IPBES, IPCC and amongst scientists and relevant scientific bodies of other MEAs; and c) to provide assistance to the EU and Associated Countries, and to Central Asian and African scientists, knowledge holders and local communities for reinforcing their input into IPBES and IPCC.</p> <p>5) Further options for enhanced IPBES-IPCC collaboration should be explored in the frame of the next IPCC cycle. The next IPCC cycle will start with the election of a new Bureau, expected in July 2023. The workload and timing of the next cycle is to be determined. In the scoping of IPCC reports under its 7th cycle, increased attention should be given to climate-biodiversity interactions. Collaborative work with IPBES might be a standing item on the agenda of the new Bureau.</p> <p>6) We support suggestions as compiled in IPBES/9/INF/26.</p>

Appendix

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 different ecosystems against climate change	Examining the effects of interventions on the resilience of different ecosystems against climate change should 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			Proposal by BMBF 617

Topic	Background	Contribution from experts working in IPBES/IPCC	Experts	Comments from IPBES / IPCC Coordination office
	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
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	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	Thomas Hickler Josef Settele Almut Arneth & (Smith <i>et al.</i>) Pete Smith David K.A. Barnes	Land-based Carbon Dioxide Removal (CDR) options

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	very general, e.g. global level, which does not help with implementing solutions at regional scales.	“second-generation bioenergy crops”, which are used in IAMs.	Kazuhiro Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	
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 Kazuhiro Ichii Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	

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<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.</p> <p><u>Restore:</u> Restoration of degraded land and ecosystems including marine.</p> <p><u>Manage:</u> Climate- and biodiversity-friendly agricultural, forestry, fishing and aquaculture practices; Localization of supply chains; Changes in consumption.</p> <p><u>Create:</u> Urban greening and biodiversity support; Trophic rewilding; Combined technology- and nature-based mitigation options; Mitigation opportunities on newly emerging habitats.</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>	
<i>Soil & Soil Biodiversity</i>				
The role of soils and soil biodiversity for ecosystem Carbon storage and resilience to climate change/extremes	<p>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.</p>	<p>IPCC: projections of climate change and ecosystem Carbon-cycle</p> <p>IPBES: observational and experimental evidence as well as projections of the role of soil biodiversity in soil C dynamics</p>	Nico Eisenhauer	
Feedback effects of climate change and soil loss (e.g. erosion, sealing)	<p>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.</p>	<p>IPCC: consider soil loss in scenario modelling</p> <p>IPBES: define the multiple roles that current and future soils play in climate and biodiversity change</p>	Nico Eisenhauer Josef Settele	
<i>Scenarios and Modeling</i>				
New regional and global scenarios, beyond the 'climate-centric' approach	<p>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 analysis in IPBES. However, the new IPBES Nature Futures Framework (NFF) asks for scenarios (and analysis of</p>	<p>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).</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</p>	Almut Arneth	

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	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.	range of plausible futures and pathways to achieve these and, ii) use these (and IPCC) scenarios in impact models and analyse outcomes in view of the Nature Futures Framework (NFF)		
<i>Food Security / Consumption and Production</i>				
Demand side action on food and energy	From previous IPCC and IPBES reports it is well established that changes in per-capita demand of food (esp. animal protein) and energy, jointly with a more equitable distribution globally, is important to reduce greenhouse gas emissions and destruction of ecosystems. However, numerous options in this context have not yet been explored.	IPCC: develop modelling tools and scenarios that more succinctly account for options beyond changes in diets or energy savings. IPBES: assess impact and possible trade-offs/co-benefits of 'new' technologies, such as vertical farming, CRISPR, alternative meat, agrovoltaics.	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 Kazuhito 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 partially projected from past responses. Specific traits and environments of ancient species rendered them particularly vulnerable to climate change, whereas others are surprisingly robust. Long-term perspectives on the intertwining between climate-change and biodiversity are urgently needed, especially concerning extinction risk.	IPCC: Paleoclimate data (IPCC Working Group I) and past responses to climates change (IPCC Working Group II). IPBES: Quantifying the role of direct human impacts on biodiversity relative to climate change. Bridging time scales as major challenge.	Wolfgang Kiessling	
Protected areas and ecosystem restoration in	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	IPCC: projections of climate change and ecosystem C-cycle (models without or incomplete	Almut Arneth & (Smith <i>et al.</i>) Pete Smith	

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the climate/biodiversity nexus	<p>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>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>	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	
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>		(Smith <i>et al.</i>) Pete Smith Almut Arneth David K.A. Barnes Kazuhito Ichii	

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	<ul style="list-style-type: none"> →Realizing the full potential of nature-based solutions, including their social co-benefits. (Incentives e.g.: attractive carbon price; create international carbon markets). →Changes in the way we relate to ourselves and the rest of nature →‘nature-based human development’ (UNDP, 2020). →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. →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. 		Pablo A. Marquet Alex Popp Hans-Otto Pörtner Alex D. Rogers Robert J. Scholes Bernardo Strassburg Jaingui Wu Hien Ngo	
Good environment stewardship practices are dynamic	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.		(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	