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Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services Seventh session Paris, 29 April–4 May 2019

Paris, 29 April–4 May 2019 Item 5 of the provisional agenda*

Report of the Executive Secretary on the implementation of the first work programme for the period 2014–2018

Information on work related to knowledge and data

Note by the secretariat

- 1. In section II of its decision IPBES-2/5 on the work programme for the period 2014–2018, the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) established a task force on knowledge and data for the period 2014–2018, whose terms of reference are set out in annex III to that decision. In order to more effectively fulfil its mandate, in 2016 the task force on knowledge and data established three task groups subgroups of the task force on knowledge and data, consisting of members of the task force and resource persons on (a) indicators and data for IPBES assessments, (b) web-based infrastructure in support of data and information management needs, and (c) knowledge-generation catalysis.
- 2. In 2016, the task force developed a list of 30 core indicators, which authors were urged to use as part of the regional assessments, the land degradation and restoration assessment and the global assessment of biodiversity and ecosystem services, in addition to other indicators or data sources they might use. The task force also developed 42 highlighted indicators that authors could use, but with no expectation regarding their consistent use in the assessments (see appendices III and IV to document IPBES/5/INF/5). It also developed a draft process for catalysing the generation of new knowledge and conceptualized and monitored the development of a web-based infrastructure as part of the IPBES website. In section III of its decision IPBES-5/1, the Plenary took note of the outline workplan for the task force on knowledge and data for 2017 and 2018 and requested its further development with clear deliverables and milestones.
- 3. In section III of its decision IPBES-6/1, the Plenary welcomed the progress made in the implementation of the workplan, citing document IPBES/6/INF/14, which outlined activities for 2018, including activities related to the use of indicators in IPBES assessments, to the development of additional features on the IPBES website, and to the identification of gaps in knowledge, information and data in completed IPBES assessments. In the same decision, the Plenary requested the Executive Secretary, working with the Multidisciplinary Expert Panel, to step up efforts to catalyse the generation of new knowledge, in particular addressing knowledge gaps identified in IPBES assessments and using transparent processes in addition to bilateral meetings to mobilize or generate such knowledge and data, subject to the availability of financial resources.
- 4. The annex to the present note, which is presented without formal editing, sets out information on progress made by the task force on knowledge and data in its work and on future steps that the task force might undertake during the new work programme up to 2030, should the mandate of the task force be extended by the Plenary.

^{*} IPBES/7/1/Rev.1.

Annex

Information on work related to knowledge and data

I. Overview

1. After the sixth session of the Plenary, the task force on knowledge and data continued to work in the three task groups established in 2016 on (a) indicators and data for IPBES assessments, (b) web-based infrastructure in support of data and information management needs, and (c) knowledge generation catalysis. In sections II to VI below, information is set out on activities undertaken in relation to these three areas of work and activities suggested to be implemented between the seventh and eighth sessions of the Plenary, should the Plenary decide to extend the mandate of the task force.

II. Guidance and support regarding the use of indicators in IPBES assessments

A. Introduction

- 2. According to its terms of reference, the responsibilities of the task force on knowledge and data include to advise on the indicators and metrics to be used in IPBES products and on the standards necessary for capturing and managing associated data (decision IPBES-2/5, annex III, section B, paragraph (d)).
- 3. The work of the task group on indicators has been articulated around three main elements: (i) guidance on core and highlighted indicators for use in IPBES assessments, including on social-ecological bundles of indicators, (ii) collaboration with organizations that have developed the selected indicators regarding the provision of information and data related to those indicators, and (iii) the provision of tailored support to assessment authors regarding the use of indicators.

B. Progress achieved in supporting experts working on assessments regarding the use of IPBES core indicators

- 4. In response to its mandate, the task force on knowledge and data developed a list of 30 core indicators, which authors were urged to use in addition to other indicators or data sources they may choose, and 42 highlighted indicators, which authors may be interested in using, but with no expectation regarding their consistent use in the assessments. The lists were approved by the Multidisciplinary Expert Panel following its seventh meeting, held in Bonn in June 2016, and were set out in appendices III and IV to document IPBES/5/INF/5.
- 5. After the fifth session of the Plenary, the task group on indicators, supported by the technical support unit on knowledge and data, developed a set of standardized visualizations for 26 (out of 30) core indicators, for which data was available. The visualizations were intended to support assessment authors in the communication and interpretation of the status and trends of biodiversity and ecosystem services as described by indicators at the global, regional and sub-regional levels. The visualizations were meant to enable the consistent and appropriate representation of indicator information across all chapters and assessments
- 6. The process of selecting a set of core indicators for use in IPBES assessments, liaising with indicator providers regarding access to data and preparing a set of standardized visualizations was only finalized at a late stage of the regional assessments of biodiversity and ecosystem services and of the assessment of land degradation and restoration, and therefore their authors were not in a position to use all of the core indicators and the standardized visualizations in the assessments.
- 7. The technical support unit, since the sixth of the Plenary, has continued to liaise with indicators providers regarding updates in their data and updated the visualizations as necessary. These visualizations were made available to the authors of the global assessment of biodiversity and ecosystem services, for their preparation of the second order draft of the chapters of the assessment and of the first order draft of the summary for policymakers. The global assessment used almost all core indicators, for which there was data available, mainly in chapters 2 and 3, which report on status and trends and on progress towards

international goals and targets and to a lesser extent in chapter 5, which assesses pathways towards a sustainable future. Authors used additional indicators depending on their needs to complement these core indicators. For example, authors used in both chapters 2 and 3 the Red List Indices estimated for a range of different subsets of species in addition to the core indicator "Red List Index".

8. In addition, the technical support unit attended the first author meeting of the assessment of the sustainable use of wild species, to present the work they had done for previous assessments and the support available for that assessment in terms of data and indicators. The technical support unit also liaised with the assessment on values to support the identification of knowledge gaps relating to indicators. The authors of these two assessments are currently at an early stage of their work and need more time to define what their needs are regarding these matters.

C. Approach to social-ecological bundles of indicators in IPBES assessments

- 9. The 30 core indicators did not sufficiently cover some of the components of the IPBES conceptual framework (set out in the annex to decision IPBES-2/4), including "nature's contributions to people" and "good quality of life", nor the relationships among the various components of the conceptual framework, depicted by its arrows. Therefore, between 2016 and 2018 efforts were undertaken to identify socioeconomic indicators to represent those aspects of the IPBES conceptual framework not covered by the 30 core indicators.
- 10. A workshop was organized in Seoul, Republic of Korea, from 5 to 7 December 2017, with financial support from the Ministry of the Environment of the Republic of Korea, to pilot, test and further develop an approach to identify indicators for all elements of the IPBES conceptual framework relating to a specific theme, the theme at this workshop being the relationship between biodiversity and food. The workshop involved members of the task force and a number of resource persons, including representatives of relevant multilateral environmental agreements, international processes and organizations.
- 11. The outcomes of the workshop included (a) a preliminary list of indicators related to the relationship between biodiversity and food: sustainable production, diversity and access, and the dimensions and components underlying this theme, for further consultation with experts within and outside of IPBES and (b) proposed guidance on the use of social-ecological bundles of indicators in future IPBES assessments.
- 12. It is proposed that the Multidisciplinary Expert Panel, at its thirteenth meeting (scheduled for July 2019) consider a revised approach to the selection and use of social-ecological "bundles" of indicators, with a view to applying that approach as part of the ongoing thematic assessments.

III. Web-based infrastructure in support of data and information management

- 13. According to its terms of reference, the responsibilities of the task force on knowledge and data include support to the secretariat in overseeing the management of the data, information and knowledge used in developing IPBES products so as to ensure their long-term availability and to identify opportunities for increasing access to existing data, information and knowledge. The task group on web-based infrastructure, since the fourth session of the Plenary, has conceptualized and overseen work in this area. The infrastructure provides IPBES members with key information, including relevant official documentation, IPBES catalogues, finalized deliverables and other products, and IPBES experts with information pertaining to their work, and the possibility of contacting relevant experts and stakeholders.
- 14. The following activities have been undertaken as part of the work plan that was submitted to the Plenary at its sixth session (IPBES/6/INF/14) for implementation between the sixth and seventh sessions of the Plenary:
- (a) Design, implement, test and make available for review of the task group additional features on the website:
 - (i) The expert group on policy support tools and methodologies, at their meeting in August 2018 (see IPBES/7/INF/13), made recommendations for further developing the policy support portal. Terms of reference for web development services to further improve the website and portal were prepared and shared with the task group for feedback;

- (ii) The secretariat developed a forum1 which was used to engage and receive feedback from participants of the web conference on 'Land Degradation and Restoration Knowledge Gaps and Needs' that was held from 14 January to 4 February 2019;
- (iii) A feature allowing IPBES stakeholders to interact among themselves was developed within the website in collaboration with IUCN. The Open Ended Network of IPBES Stakeholders is piloting its use² to increase the membership of the network and to post news items and events;
- (b) Train programme staff at the secretariat, including the technical support units, to enhance the content of the website:
 - (i) The secretariat developed and is maintaining technical documentation³ on the website to enhance transparency, continuity and engagement in the further development of the website;
 - (ii) The secretariat has started to prepare training manuals and to hold one-to-one sessions for its staff, including for technical support staff, to ensure the content of the website is kept up to date;
 - (c) Further enhance the accessibility of the website for internal and external users:
 - (i) A graphic design contractor was hired to improve the user interface of the website. The contractor reduced the stylesheets by 80%. This improved website loading time and made it easier to maintain and update style changes;
 - (ii) A contract for graphic design and the user interface improvement, to further enhance the accessibility of the website was issued in March 2019. The contractor will work over a period of 5 months to redesign and upgrade the IPBES website, enhance features, and implement recommendations of the expert group on policy support tools and methodologies, aimed at making the policy support portal attractive, distinct and user-friendly.
- 15. The Multidisciplinary Expert Panel and Bureau, at their twelfth meetings, acknowledged that the work of the task group on the web-based infrastructure pertaining to the specific needs of the secretariat (such as handling nomination and selection processes for experts, submissions of comments to drafts of assessments or responses to questionnaires, mass mailing, and of meeting registrations and building of a file management system) could be considered complete and handed over to the secretariat for further development and maintenance.

IV. Knowledge generation catalysis

- 16. According to its terms of reference, the responsibilities of the task force on knowledge and data include to support the Bureau and the Multidisciplinary Expert Panel in reviewing the knowledge needs and gaps identified through Platform scoping processes and assessments and to catalyse the generation of new knowledge and data, in convening dialogues with scientific organizations, policymakers and funding organizations and in undertaking other activities to address those needs identified in the work programme. The terms of reference respond to one of the four functions of IPBES, as set out in the functions, operating principles and institutional arrangements of IPBES, which is to identify and prioritize key scientific information needed for policymakers at appropriate scales and catalyse efforts to generate new knowledge by engaging in dialogue with key scientific organizations, policymakers and funding organizations, but not directly undertake new research.
- 17. Between the fourth and the fifth sessions of the Plenary, the task force on knowledge generation had developed a pilot process for catalysing the generation of new knowledge, which was presented to the Plenary in document IPBES/5/5. From 27 to 29 November 2017, a workshop was organized at the University of Reading, United Kingdom, to pilot the process of identifying gaps in knowledge emerging

¹ https://www.ipbes.net/forum.

² https://www.ipbes.net/group/onet.

³ https://ipbes-docs.readthedocs.io/en/latest/.

⁴ UNEP/IPBES.MI/2/9, annex I, appendix I.

from the pollination assessment. This workshop was supported and led by the co-chairs of that assessment using a systematic method, and was the first of the three steps outlined in the pilot method (IPBES/6/INF/14), which include:

- (a) Identification of gaps in knowledge, information and data in the IPBES work programme, and in completed assessments;
- (b) Consultation on these gaps and the formulation of priority areas for knowledge generation with the scientific community;
- (c) Tailoring of these priority research areas to potential research-funding institutions and their communication to these funding organizations, mainly by means of bilateral meetings.
- 18. As reported to the sixth session of the Plenary, the task group on knowledge generation prepared a proposal for a further developed general approach to identify gaps in knowledge emerging from IPBES assessments, set out in appendix V to document IPBES/6/INF/14. The task group recommended focussing on the identification of knowledge gaps throughout the assessment process, and proposed concrete elements to this approach. The Multidisciplinary Expert Panel and the Bureau, at their eleventh meetings endorsed the planned steps, in particular a web conference to consult on knowledge gaps, and recommended to pilot this approach, for both the pollination and the land degradation and restoration assessment. The Multidisciplinary Expert Panel and the Bureau, at their twelfth meetings, however, advised to focus the process on the land degradation and restoration assessment.
- 19. The web conference on land degradation and restoration took place from 14 January to 4 February 2019. Its objective was to inform scientists, other knowledge holders and other stakeholders of IPBES on the knowledge gaps identified by the authors of the assessment, and to seek feedback and additional suggestions on these gaps. The web conference was of a consultative nature.
- 20. Invitations to participate were sent to all people registered in the IPBES database. A group of 155 individuals, composed of scientists (80%), policymakers (10%), and practitioners (10%) participated in this three-week process, which offered the opportunity to discuss the gaps identified by experts (week 1), to reflect on knowledge needs (week 2), and to discuss how these needs could be addressed (week 3). A report on the web conference is posted on the IPBES web site.⁵
- 21. The task force discussed the outcome of the web conference and the use of such web conferences to catalyse the generation of new knowledge at their meeting in March 2019 and made recommendations in the context of the next work programme up to 2030 (see section VI).

V. Collaboration with partner organizations

22. In its decision IPBES-5/1, the Plenary encouraged the task force to develop terms of reference to specify the modalities of its collaboration on specific tasks with partner organizations. At its sixth session, the Plenary was presented with a list of organizations which play a role in the work of IPBES on data and knowledge in appendix VI of document IPBES/6/INF/14. A list of in-kind contributions of partner organizations is set out in the appendix to this document.

VI. Future work on data and knowledge for the IPBES work programme up to 2030

23. The last meeting of the task force for the first work programme was held from 20 to 22 March 2019 in Bonn, Germany. Task force members reflected on lessons learned, achievements and challenges encountered during the first work programme, and drew some recommendations, which are summarized in the sections below.

A. Indicators and data in IPBES assessments

24. The task force recommended that the list of 30 core indicators and 42 highlighted indicators and their associated factsheets are brought to the attention of all on-going assessments as a resource. The set of standardized visualizations developed by the task group on indicators and supported by the technical

⁵ www.ipbes.net/sites/default/files/ldr-gaps-needs-report.pdf.

support unit would remain available as a resource for on-going and future assessments. Further work on the visualization of indicators would not be envisioned.

- 25. The list of 30 core indicators could be revisited at the thirteenth meetings of the Bureau and Multidisciplinary Expert Panel in light of the 16 criteria for indicators developed by the task force in 2016, set out in the annex to document IPBES/5/INF/5.
- 26. At these same meetings, the Bureau and the Multidisciplinary Expert Panel would be invited to review the approach to social-ecological bundles of indicators, which would be further developed in the context of ongoing and future assessments in order to have a more comprehensive set of indicators which fully addresses the IPBES conceptual framework.
- 27. Authors groups of all on-going assessments would be advised to form a liaison group on data and indicators, composed of a small number of authors, which would ensure that all figures, tables and maps were produced according to the guidelines of the IPBES data management policy (see section B below) and accompanied with a digital object identifier (DOI) for source traceability.
- 28. The task force on knowledge and data will develop a data management policy, building on earlier work undertaken by the task force, regarding the archival in public data repositories of knowledge produced by IPBES including data, codes and algorithms. This data management policy should include the workflows from citation of original data sources, to knowledge production and analysis, concluding with publication and archival. This data management policy would ensure that all IPBES products are traceable, accessible and reproducible. This policy will be presented to the Multidisciplinary Expert Panel and Bureau at their thirteenth meetings for their consideration.

B. Web-based infrastructure in support of data and information management needs

- 29. The task force recommended to change the name of the task group on "web-based infrastructure" to "data management task group", to better reflect the nature of the work performed..
- 30. The task force made the following additional recommendations:
- (a) The future task force on knowledge and data should include expertise in data architecture and infrastructure, data management policy, and data workflows;
- (b) IPBES is responsible for archiving all the data used in the production of assessments, including spatial, non-spatial, qualitative, and quantitative data, irrespective if developed or owned by other institutions or by IPBES and for making them accessible in the long term via digital identifier (e.g. DOI) or referenced with a digital object identifier. In addition, the data should be publicly available under an open access license;
- (c) There should be a single entry point for identifying and, where possible, retrieving, the data and metadata used by IPBES assessment teams, as well as outputs derived from this data, and the codes and algorithms used to generate them. Wherever possible, the original datasets and derived outputs should be cited using a digital object identifier, to ensure full transparency, reproducibility and attribution. Data outputs, codes and algorithms should be archived using external repositories and linked to specific assessments using appropriate and standardized metadata. The data centre could be managed by external partners in coordination with the technical support unit on knowledge and data. The principles of reproducible science should be followed;
- (d) Assessment expert groups should, whenever possible, use open source tools and open standards for file formats to ensure that assessment outputs are reproducible and accessible;
- (e) The secretariat should take into account national and institutional restrictions when recommending the use of a tool for online collaboration of assessment authors in the development of assessments;
- (f) References from all assessments should be stored in a central database accessible through a web interface and be searchable by assessment, chapter and additional key words and exportable in multiple formats;
- (g) Assessment experts should be provided with a comprehensive guide including a list of all recommended tools and data management principles before they begin work. The guide should be easily accessible and acknowledged in writing by all experts. The guide should include information on access,

support, and policies. This should be kept up to date by the secretariat and reviewed regularly by the task force.

C. Knowledge generation catalysis

- 31. The task force recommended that expert groups of ongoing and future assessments be requested to identify knowledge gaps in parallel to content development, but not at the scoping stage, which was considered to be premature. The knowledge gaps identified within each chapter would be discussed as part of each author meeting. The technical support unit of the assessment together with the technical support unit on knowledge and data would make available to authors templates for the identification of knowledge gaps and would support their consistent use. The existing draft template would be modified to allow for the inclusion, by authors, of a short context or rationale for each knowledge gap, as well as an assessment of its importance (i.e. prioritization) that can be used in the phase of gap filling.
- 32. The knowledge gaps identified in the different chapters of an assessment would be consolidated into a list that is made available for review as part of the external review periods of an assessment in order to: 1) catalyse the generation of new knowledge in the short term and/or the filling of these gaps in the course of the assessment cycle and/or 2) to identify knowledge gaps that cannot be filled in the course of the assessment cycle but which would be disseminated and communicated to the wider community of researchers and practitioners to be filled in the longer term (i.e. knowledge generation catalysis). The latter list of knowledge gaps would form a standalone section in the assessment report, alongside the assessment chapters.
- 33. IPBES would hold, every year, a one-day web conference on identified gaps upon invitation, focused on one or several assessments, where authors would present these gaps in detail, to an audience composed of representatives of research funding agencies, research programme developers and institutions involved in funding and prioritizing data mobilization, among others. The audience would be carefully selected, ahead of the web conference, for knowledge generation catalysis pertaining to each assessment. The purpose of these web conferences, which would include virtual plenaries and virtual break out groups, would be 1) for the audience to have a good opportunity to be informed about IPBES gaps and to interact with those IPBES experts having identified the gaps, and 2) for IPBES to receive information about potential opportunities for knowledge generation catalysis (such as new calls for research and data mobilization) and identify follow up opportunities to catalyse knowledge generation.
- 34. Following these web conferences, dedicated steps could be taken to follow up on opportunities identified. These could include bilateral meetings between representatives of funding agencies, or of established networks of funders and IPBES secretariat and experts, to further exchange on IPBES gaps and to further inform the definition of research and data mobilization priorities, or presentations upon invitation by IPBES experts at meetings of potential funders and of organisations setting research priorities and able to fund research.

Appendix

List of organisations which provided in-kind contributions to the work of IPBES on knowldge and data

Organization	Role	Modalities
Future Earth	 Provision of support to the evaluation of indicators regarding their relevance for IPBES assessments Provision of support in gathering relevant expertise and helping to identify and mobilize specialized experts Provision of support to the knowledge generation function 	 Organization of IPBES-relevant expert workshops Resource persons to task force Memorandum of Understanding
United Nations Environment Programme - World Conservation and Monitoring Centre (UNEP-WCMC) in its function as the secretariat of the Biodiversity Indicators Partnership (BIP)	- Provision of technical support to the technical support unit and task group on knowledge and data regarding the use of the core indicators that are provided by members of the partnership	 Management of the interaction between IPBES and BIP members; Resource persons to task force IPBES Secretariat participates in steering committee of BIP
Global Biodiversity Information Facility	 Provision of support to IPBES assessments in identifying and accessing relevant biodiversity datasets, in particular with regard to data provision for indicators Provision of support for catalysing generation of new knowledge, through mobilization of data to address identified knowledge gaps 	Resource persons to task force Memorandum of Understanding
BiodivERsA and the Belmont Forum	 Contribution to filling knowledge gaps identified in the IPBES report on biodiversity scenarios; text of call for international proposals accounting for key recommendations made in this report Provision of in-kind resources to develop and implement the call, and of funds (28 million €) to fund research projects 	Launch of a joint call for research proposals, with support of the European Commission, to fund projects producing new biodiversity scenarios taking into account the recommendations from the IPBES assessment report on scenarios and models of biodiversity and ecosystem services Invitation of IPBES representatives to follow-up meetings and actions
The Group on Earth Observations – Biodiversity Observation Network (GEOBON)	 Provision of support to the use of indicators and data in IPBES assessments Catalog and visualization of Essential Biodiversity Variables datasets generated by IPBES 	Resource persons to task force Memorandum of Understanding
The Food and Agriculture Organization of the United Nations (FAO)	- Provision of support to the use of indicators in IPBES assessments by making available fact sheets for the various indicators, supplying related data and collaborating with the task group on the preparation of visualizations	- Collaborative partnership arrangement to establish an institutional link between the Plenary and the United Nations Environment Programme, UNESCO, FAO and UNDP
United Nations Educational, Scientific and Cultural Organization (UNESCO) Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO)	 Provision of support to the knowledge generation function Contribution of data to the global assessment through the Ocean Biogeographic Information System 	 Collaborative partnership arrangement Collaborative partnership arrangement through UNESCO

Organization	Role	Modalities
United Nations Development Programme (UNDP)	- Provision of support to the knowledge generation function through trialogues on IPBES assessments	- Collaborative partnership arrangement
Inter-American Institute for Global Change Research (IAI)	- Provision of support to the knowledge generation function (through its science programmes)	- Memorandum of Understanding
The Biodiversity Indicators Partnership BioTime The University of St. Andrews Alliance for Zero Extinction (AZE) BirdLife International Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) The Commonwealth Scientific and Industrial Research Organization (CSIRO) Forest Stewardship Council (FSC) Global Footprint Network German Centre for Integrative Biodiversity Research Indicators for the Seas programme (IndiSeas) Institute of Social Ecology at the Alpen Adria University in Vienna International Nitrogen Initiative International Union for Conservation of Nature (IUCN) The Map of Life Marine Stewardship Council (MSC) Organization for Economic Cooperation and Development (OECD) The Netherlands Environmental Assessment Agency (PBL) Princeton University Programme for the Endorsement of Forest Certification (PEFC) Projecting Responses of Ecological Diversity in Changing Terrestrial Systems (PREDICTS) collaborative project Sea Around Us research initiative Secretariat of the Convention on Biological Diversity (CBD) Terralingua, the Tropical Ecology Assessment and Monitoring (TEAM) network United Nations Statistics Division UNEP-WCMC Water Footprint Network The Database of Island Invasive Species Eradications (DIISE) The University of Maryland Center for Environmental Science The World Bank The World Resources Institute (WRI) The Yale Center for Environmental Law and Policy The Zoological Society of London (ZSL)	- Provision of support to the use of indicators in IPBES assessments by making available fact sheets for the various indicators, supplying related data and collaborating with the task group on the preparation of visualizations	- Correspondence with the BIP Secretariat or IPBES technical support unit for knowledge and data - Acknowledgement as in-kind support in budget documentation and on web site

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