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Item 5 (a) of the provisional agenda*

**Initial work programme of the Platform: task forces on
capacity-building, knowledge and data (including data
and management plan/system) and indigenous and local
knowledge systems****Outcome of the task force on knowledge and data, including the
draft data and information management plan (deliverables 1 (d)
and 4 (b))****Note by the secretariat**

1. In accordance with the work programme for 2014–2018 approved by the Plenary at its second session, the Bureau and the Multidisciplinary Expert Panel have established a task force on knowledge and data for the period 2014–2018, chaired by the Bureau in consultation with the Panel, for the implementation of deliverables 1 (d) and 4 (b) of the work programme in accordance with the terms of reference set out in annex III to decision IPBES-2/5. The task force was selected from a pool of experts nominated by Governments and observers. The task force met in Seoul from 3 to 6 June 2014, thanks to generous in-kind support received from the Republic of Korea.
2. The secretariat, working with the Bureau and the task force, has developed a draft data and information management plan, in close coordination with and building on current international initiatives, in order to support the work of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. The draft data and information management plan is set out in the annex to the present note for consideration by the Plenary at its current session, as deliverable 4 (b). It is suggested that it be considered as an initial plan, to be regularly updated and further developed as needs become better defined with the implementation of the work programme.
3. In addition, the task force has produced a draft knowledge and data strategy in order to address responsibilities pertaining to deliverable 1 (d) as listed in annex III to decision IPBES-2/5. The draft strategy is provided to the Plenary for information (see IPBES/3/INF/3), together with additional information on the task force. It should be noted that a technical support unit has been established for this task force at the National Institute of Ecology, Republic of Korea.

* IPBES/3/1.

Draft data and information management plan

I. Context

1. In order to strengthen the foundations of the science-policy interface, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services agreed on a work programme for the period 2014–2018. This work programme includes deliverable 1 (d), which aims to ensure that priority knowledge, information and data needs for policymaking are met by catalysing efforts to generate new knowledge and by networking; and deliverable 4 (b), which aims to develop a data and information management plan. The task force on knowledge and data established by the Plenary is responsible for both of these deliverables. Key functions of the task force include the mandate to identify and prioritize key scientific knowledge needed for policymakers at appropriate scales; to facilitate access to requisite knowledge, information and data and to provide guidance on the management thereof; and to catalyse efforts to generate new knowledge in dialogue with scientific organizations, policymakers and funding organizations.

2. The draft data and information management plan was prepared by the secretariat, working with the Bureau and the task force.

3. The primary motivation for the Plenary's request for a data and information management plan (see decision IPBES-2/5, annex III) is to ensure access, in the future, both to the Platform's outputs and to the knowledge, information and data needed for their realization. This is important in respect of both the transparency and the replicability of findings, and is therefore a key issue for the credibility of the Platform. Moreover, it is normal practice in the process of producing peer-reviewed publications for the knowledge, information and data on which the analyses and the findings are based to be disclosed and traceable.

4. The development of the plan will support long-term secure access to the knowledge, information and data gathered through activities of the Platform. The task force, supported by the technical support unit, will implement the plan, building on current international initiatives and reflecting the approach of strategic partnerships or other mechanisms pursued by the Plenary.

5. The plan is being developed by the task force as part of a broader knowledge, information and data strategy (see IPBES/3/INF/3), that aims to guide the work of the task force over the years of its existence, providing a context for other deliverables involving knowledge, information and data, while also serving as a source document for other outputs of the task force.

6. The Platform intends to draw rigorously on existing knowledge and catalyse the development of new knowledge from diverse sources of quality-assured data and information. Consequently, it will need to put in place processes and structures to safeguard the quality of the data in compliance with various policy objectives, to ensure data longevity, to build partnerships with service contributors and custodians of data and information, and to foster consistency across the deliverables of the Platform and their sharing through the development of standards and guidelines. These processes and structures must be able to accommodate and integrate diverse disciplines and knowledge systems.

7. These processes must interact strongly with other activities of the Platform, including the other task forces and assessments. The task force on indigenous and local knowledge systems is developing procedures and approaches for working with indigenous and local knowledge holders. The task force on capacity-building will drive a wide range of capacity-building activities, including improving access to existing knowledge, information and data. A close working relationship between the three task forces will be established to facilitate full access to the knowledge that will be needed for activities and deliverables related to the Platform. All three task forces will collaborate in the design of methodological guidelines, in the development of indicators and metrics, and in the planning and convening of science-policy dialogues.

8. It is envisaged that the task force on knowledge and data will give advice during the scoping and delivery of the Platform assessments. During the scoping process, the task force will be entrusted with guaranteeing quality, by ensuring the rigorous identification of relevant knowledge, information and data. During the preparation and delivery of an assessment, the task force will provide support with regard to access to and the management and quality control of the knowledge, information and data. The task force will also provide support in relaying information on the gaps in scientific knowledge and data identified during the assessments to relevant partners and catalyse the process of filling those gaps. In addition, the task force has the mandate to identify key scientific points needed

for policymakers and to facilitate access to the knowledge, information and data needed in decision-making. Accordingly, the task force will support the Platform's work on policy support tools and methodologies by providing advice on and access to the knowledge, information and data needed to employ the policy support tools and methodologies identified by the Platform.

II. Objectives of the data and information management plan

9. The existing landscape of data, information and knowledge services relevant for the Platform is diverse and evolving, and lacks coordination. Current sources of data will be critically reviewed and categorized by the task force in partnership with others during 2015 in order to support delivery of the scheduled assessments and policy support tools and methodologies.

10. The aim of the plan in the first instance is to ensure that the knowledge foundations of the Platform are in place in 2015. To achieve this, the task force has identified the following operational objectives, to be achieved by a set of urgent, high-priority activities (see sect. IV below), as follows:

(a) Establishment of standards and guidelines for managing information and data, including advice on the indicators and metrics to be used in the Platform's products for the standards necessary for capturing and managing associated data, and on the handling of knowledge gaps and uncertainty;

(b) Provision of access to the data, information, and knowledge needed in delivering scheduled assessments and using identified policy support tools and methodologies through a sustainable data and information platform;

(c) Identification of means of systematically identifying and addressing the data and information gaps and needs of the Platform's member States;

(d) Formation of close coordination and collaboration with relevant international initiatives to support the Platform in implementing the plan.

11. As the Platform's needs develop, along with the proposed strategy for knowledge, information and data, which will survey and formulate broader needs in this area across the Platform, the plan will be revised and updated regularly by the task force.

III. Principles for managing knowledge, information and data in the Platform

12. The following principles build on and expand the Platform's operating principles in the context of knowledge, information and data and will guide implementation of the plan:

(a) *Quality and security.* Developers and users of the Platform's deliverables must be able to rely on the quality of the knowledge, on which they are based, and the lifespan and integrity of the data. Accordingly, the plan will build processes that help, first, to provide access to the best knowledge available for different policy objectives; second, to ensure the long-term security and back-up of data; third, to provide transparency (source, process, provenance and traceability) for data and information but also for the Platform's indicators and other knowledge outputs; fourth, to promulgate standards for metadata and possibly other descriptive information; and, fifth, to help ensure consistency and the standardization or appropriate interpretation of data and information collected at multiple scales and with often different methodologies and sampling efforts;

(b) *Building knowledge through partnerships.* The custodians of data and knowledge essential to the Platform's work programme are many and diverse, and the programme can only be delivered through collaboration. Consequently, the plan will, first, enhance delivery across the whole Platform by interacting with and supporting other deliverables; second, avoid duplication by maintaining productive relationships with relevant players; third, recognize the needs and interests of custodians of data and knowledge, such as access rights, and intellectual property rights; and, fourth, devise schemes to incentivize data-sharing and publication;

(c) *Accessibility.* Free and open access to its deliverables and to the material on which they are based is a core value of the Platform. Consequently, the plan will, first, aim for open, permanent access to data and information sources for its deliverables (e.g., in the scientific literature) with minimal restrictions; second, enforce the use of common and accessible file formats in the Platform's deliverables; third, emphasize the need to communicate the availability of the data and information; and, fourth, facilitate multilingual discovery and sharing of data and information;

(d) *Diverse disciplines and knowledge systems.* Many sources of data, information and knowledge will be critical to the delivery of the Platform's work programme, including natural and social scientific disciplines, along with different types of knowledge such as indigenous and local knowledge systems. For that reason, the plan will foster, first, multidisciplinary; second, knowledge management systems that are inclusive and seek to get the best out of diverse forms of knowledge; third, joint creation of knowledge by both researchers and research users; fourth, equity and balanced regional representation; and, fifth, close collaboration with the task forces on indigenous and local knowledge systems and capacity-building;

(e) *Open science.* The open science approach promotes the generation of knowledge through collaboration based on free and open access to knowledge, information and data. Open science therefore ensures that the work of all the researchers and stakeholders involved is fully recognized and properly attributed. Adoption of these principles and of this approach means a significant cultural change in the ways in which science is done and scientific results and underlying data are shared publicly by authors, journals and research organizations and thus made relevant to society. This cultural change is already happening in various scientific disciplines such as astronomy, neurobiology, molecular genetics and oceanography, among others. In the context of the Platform, the open science approach could engender very significant advances in data integration, analysis and interpretation, and could lead to a better understanding of biodiversity and ecosystem services.

IV. Implementing the data and information management plan

13. Taking the objectives outlined above, the task force has identified the high-priority activities set out in the table below.

Proposed implementation of the data and information management plan in 2015

<i>Activities</i>	<i>By when</i>	<i>Output or outcome</i>
1. Developing data and metadata guidelines	June 2015	Data and metadata guidelines ensuring that Platform products start on a sound and interoperable footing
2. Providing methodological principles for handling knowledge gaps and uncertainty	June 2015	Principles for handling knowledge gaps and uncertainty ensuring that Platform products start on a sound and interoperable foundation
3. Developing a proposal for a discovery and access platform for sustainable knowledge, information, and data	December 2015	A web-based discovery and access platform, building on a network of relevant initiatives and institutions
4. Providing ready access to primary research literature for all Platform experts	December 2015	All experts in the assessment expert groups and task forces have access to the full range of literature needed to conduct the assessments
5. Establishing agreements with key strategic partners regarding knowledge, information and data	December 2015	Long-term partnerships in place to provide access to existing data and information needed to support Platform products (e.g., assessments and policy support tools and methodologies)
6. Revise data and information management plan based on developments in 2015	December 2015	Plan updated and revised for 2016–2018 based on task forces' proposed knowledge, information and data strategy, consultations across the Platform, and findings from other 2015 activities of the task force

14. The activities identified in the table are proposed because they represent either essential long-term planning activities, or functions specifically requested by the Plenary, or key elements that assessments will need to have in place as the assessment expert groups carry out their tasks. Towards the end of 2015, the broader knowledge, information and data strategy for the period 2015–2018 (see IPBES/3/INF/3), will build on these foundational elements and further develop the knowledge platform of the Platform according to best global practice.

15. The technical support unit will support the task force so that it delivers on its obligations on time and according to its mandate. The Bureau and Multidisciplinary Expert Panel will review all the products of the task force, as appropriate, and ensure links between it and other task forces and relevant expert groups of the Platform. The task force will seek active collaboration with all relevant stakeholders and lead institutions that have oversight and responsibility to drive existing relevant

initiatives. These relationships will be developed as defined in the Platform's stakeholder engagement strategy.

16. The following paragraphs describe each of the high-priority activities identified in the table, proposed to implement the plan.

A. Activity 1. Developing data and metadata guidelines

17. The task force has identified the following generic types of data, information or knowledge of relevance to the Platform:

(a) **Data:** these are obtained from observations or measurements and form the basis of monitoring, research, assessments, and analysis. They may be subdivided into the following categories:

- (i) Thematic (socioeconomic, ecological, landscape, etc.);
- (ii) Geographical (global, regional, subregional, local);
- (iii) Systematic (taxonomy), descriptive or trait-based;
- (iv) Material from indigenous and local knowledge systems;

(b) **Metadata:** these provide standardized descriptors of data that facilitate their characterization, management and exchange;

(c) **Information:** a quantitative product derived from data through aggregation, integration and analysis. The Platform is likely to rely extensively on the meta-analysis of information in order to produce assessments and knowledge;

(d) **Metrics and indicators:** these provide information that places data in a context in such a manner that they can be used as products to identify the status of a species or ecosystem. As such they can effectively feed into policy support tools and methodologies, and could be used to support the writing of assessments (in a manner similar to the Global Biodiversity Outlook series of the Convention on Biological Diversity);

(e) **Knowledge and knowledge products:** knowledge is understanding gained through experience, reasoning, interpretation, perception, intuition and learning, that is developed as a result of information use and processing. It informs actions that people may take and supports decision-making. In the course of completing its assessments, the Platform will both use and catalyse the generation of knowledge and knowledge products;

(f) **Links and references:** Links, for example those in the form of stable digital object identifiers, and bibliographical references, will provide access to the original data and metadata supporting the Platform's deliverables. In order to guarantee long-term access to that data, the Platform will need to keep an accurate, up-to-date and accessible list of references and links and adopt an open-access policy harmonized across a diversity of sources and knowledge systems.

18. Data and metadata protocols are essential to help boost access to, and the usability of, data generated by a community of globally distributed stakeholders. Data that comply with a standard have the same format and meaning (syntax and semantics) and so can be integrated with other data. For example in data portals, data will be more easily accessed and widely used, allowing for robust analyses. Metadata capture information characterizing the scope and context of collected data vital for their reuse and integration and in this way facilitate their discovery.

19. The task force recommends that internationally accepted data standards and guidelines should be adopted when relevant regarding all types of data that pertain to biodiversity and ecosystem services in a broad sense, which may include species, ecological, agricultural, fisheries, socioeconomic and climate data, among others. Many biodiversity data guidelines (for example those for point occurrence data) have been developed by the community of biodiversity informatics, under the umbrella of the biodiversity data standards (www.tdwg.org). Guidelines for many biodiversity and ecosystem data types are still lacking, however.

20. The task force also takes note of the Bouchout Declaration for Open Biodiversity Knowledge Management and will explore the implications for the Platform – together with the task force on indigenous and local knowledge – adopting the principles that it espouses formally or informally during the course of 2015.

21. The task force recognizes the existence of many initiatives and systems for biodiversity and ecosystem services where data are not interoperable. The task force will foster the interoperability of data at a systems level in an open distributed computing environment, by adopting concepts and

techniques such as service-oriented computing. Providing access to interoperable data by means of state-of-the-art distributed computing interfaces should be encouraged.

B. Activity 2. Providing methodological principles for handling knowledge gaps and uncertainty

22. Data, derived metrics and models in biodiversity and ecosystem services are imperfect and often limited in their scope. Supporting effective decision-making and policy relies on careful and clear delineation and communication of these limitations. Failing to quantify and document the uncertainty around observations, derived metrics or indicators and predictions may result in false conclusions or unwarranted action, for example regarding trends or prioritization. The guidelines will need to cover the following issues:

(a) Issues surrounding the quality of available raw data (e.g., identification or measurement accuracy and precision) are a key limiting factor for the quality of analyses and the decisions that they support. In addition to preventive or corrective action, data quality should be assessed and reported in order to inform different types of downstream uses. The Platform will need to incentivize actions that contribute to a culture of data quality in biodiversity and ecosystem services, encompassing the development of methods, standards, tools and guidelines for the quality assessment of data and the prevention and correction of errors, policies on data quality, and capacity-building;

(b) The results of the aggregation and analysis of available data all have an inherent uncertainty determined by factors including the size and independence of samples, model types and other methodological properties. The Platform assessments will need to carefully address all sources of potential uncertainty, for example in climate, biodiversity and socioeconomic variables. They are expected to reduce uncertainty through careful methodology, dealing with structural uncertainty, and to characterize the degree of uncertainty in their findings;

(c) The range and scope of biodiversity and ecosystem service data that are available for metrics and analyses often only imperfectly represent the scope of assessment or policy support goals. Usually, data are systematically scarcer for certain regions, taxa, functions and services. Such biases have the potential to distort the Platform's results, indicators and, by extension, knowledge in a way that is not captured by traditional statistical metrics. The task force, with the support of the technical support unit, will develop standards in 2015 that will allow the Platform's activities carefully and quantitatively to evaluate the congruence between the scope of available information and that of the Platform's assessment and reporting targets. The task force and the technical support unit will support the capacity-building task force in activities that help document and assess limits to the representativeness of available data for the Platform and the resulting metrics and inference constraints, and inform efforts to fill gaps in knowledge.

C. Activity 3. Developing a proposal for a discovery and access platform for sustainable knowledge, information, and data

23. The task force, with support from the technical support unit, will develop a web-based infrastructure that facilitates the identification and, where possible, access to the Platform's relevant knowledge, information and data. The Platform's knowledge, information and data discovery and access system will build on and collaborate closely with partners, such as existing networks, to ensure the streamlined linkage of data and information, with appropriate attribution and metadata, into the Platform's assessments and repositories such as its catalogue of assessments. The Platform's knowledge, information and data partners include those generating and storing raw data (e.g., species occurrences, satellite imagery, climate data), indigenous and local community knowledge, indicators and metrics, literature, and expert knowledge. The knowledge, information and data discovery and access infrastructure and associated information and data streams will need clear terms of reference and long-term financial support. These will be developed further in the next update of the plan.

D. Activity 4. Providing ready access to primary research literature for all Platform experts

24. It has become clear to the task force from consultation with experts at various scoping and assessment meetings of the Platform during 2014 that many experts do not have the access to the wealth of primary, peer-reviewed literature that is essential for a well-informed and comprehensive assessment process. Exploring and ensuring access for all of the Platform's appointed experts to as much of this literature as possible will be a core task for the technical support unit, advised and supported by the task force.

E. Activity 5. Establishing agreements with key strategic partners regarding knowledge, information and data

25. Much of the work identified above will be carried out by established key partners in the field, thanks to collaborative agreements. The co-chairs of the task force have invited resource persons from the following organizations to participate in the work of the task force: the International Council for Science, the Group on Earth Observations Biodiversity Observation Network (GEO BON), the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

26. The technical support unit, in its work to support the task force, is launching a discussion process with a range of potential strategic partners. Identifying these partners is a key goal of the plan over the next year.

27. Potential partners may include the United Nations Development Programme with its Biodiversity and Ecosystem Services-Net portal (BES-Net); the International Union for Conservation of Nature (IUCN) with its Red List of Threatened Species and Red List of Ecosystems; the Food and Agriculture Organization of the United Nations, in the area of agriculture and forests under sustainable management; TRAFFIC International, a joint programme of the World Wide Fund for Nature) and IUCN, with its wildlife trade monitoring network; the Map of Life project, covering species distribution assessment and monitoring; the Intergovernmental Oceanographic Commission of UNESCO and the Ocean Biogeographic Information System; the Global Biodiversity Information Facility, with its species occurrence data; the Encyclopedia of Life online collaborative resource, with its species and trait data, and also its literature component; the Biodiversity Heritage Library, an open access repository of biodiversity literature; LifeWatch, the European e-science infrastructure for biodiversity and ecosystem research, with its biodiversity catalogue; the World Bank, with its comparative data on national gross domestic product; and UNEP-WCMC, with the World Database on Protected Areas and the trade database of the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

28. Key partners in the area of indicators and metrics may include the Biodiversity Indicators Partnership and GEO-BON, respectively.

29. Relevant knowledge products may include the Millennium Ecosystem Assessment reports; the Economics of Ecosystems and Biodiversity reports; the Global Biodiversity Outlook reports produced and published by the Convention on Biological Diversity; the United Nations Millennium Development Goal reports; assessment and special reports, technical papers and materials from the Intergovernmental Panel on Climate Change (IPCC) and the underlying data, technical guidelines and fact sheets from the IPCC Data Distribution Centre; World Bank reports; United Nations World Ocean Assessment reports in progress; and contributions from the Future Earth initiative of the Science and Technology Alliance for Global Sustainability.

30. As regional and subregional assessments are undertaken, potential strategic regional partners may emerge, such as the regional components of GEO BON, including the Arctic Biodiversity Observation Network (Arctic BON), the European Biodiversity Observation Network (EU BON), or the Asia Pacific Biodiversity Observation Network (AP BON). The technical support unit will, therefore, regularly update and review strategic partners to ensure that the Platform's assessments are properly supported by the most up-to-date data and information.

F. Activity 6. Revise data and information management plan based on developments in 2015

31. The task force recommends that the data and information management plan submitted in the present note should be considered as an initial draft which it will update and submit to the Plenary on a regular basis, as the needs for data and knowledge management become better defined with the implementation of the work programme.