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**Intergovernmental Science-Policy Platform on  
Biodiversity and Ecosystem Services**  
Task force on knowledge and data  
**Knowledge generation**

## **Updated living guidelines to support assessment experts in the knowledge gaps' identification process**

Guidance prepared by the task force on knowledge and data

Approved by the Multidisciplinary Expert Panel in February 2022 (18th meetings)

### **I. Introduction**

1. At its 8<sup>th</sup> session, the Plenary approved, in decision IPBES-8/1, the interim work plan of the task force on knowledge and data for the intersessional period 2021–2022, as set out in annex IV to the cited decision.
2. The approved interim work plan for the task force on knowledge and data sets out activities under objective 3 (a), advanced work on knowledge and data. Among activities related to knowledge generation, the task force will review and further develop the process to catalyse the generation of new knowledge, the living guidelines and the template to support assessment authors in the identification of knowledge gaps, based on lessons learned from ongoing assessments.
3. At its annual meeting, held on 29-30 November 2021, the task force on knowledge and data reflected on the elements that need an update in the current guidelines to support assessment authors in the identification of knowledge gaps, based on the lessons learned from the sustainable use of wild species, the values and the invasive alien species assessments. The task force proposed an update of the guidelines to support assessment authors in the identification of knowledge gaps, based on the outputs that emerged from the annual task force meeting. The updated guidelines are presented in the following sections.

### **II. Guidelines to support assessments experts in the knowledge gaps' identification process**

The guidelines would be followed by experts to identify and report on knowledge gaps in their respective assessments. They are intended to promote the consistent and systematic identification of knowledge gaps across all chapters of each assessment and across assessments.

Following the approval of the respective assessments, the resulting knowledge gaps sections/tables presented as part of the assessments, will be used as a basis for the dialogue between IPBES and external organizations that programme and fund new knowledge generation.

#### **Who are these guidelines for?**

The present guidelines are addressed to IPBES assessment experts including co-chairs, coordinating lead authors, lead authors (“experts”) and fellows.

## **What is a knowledge gap?**

Knowledge gaps can be defined as pieces of knowledge, information or data that are absent or insufficient to fulfil the mandate of an assessment<sup>1</sup>. The term “knowledge gaps” includes the following elements, all of which will be flagged in the gaps’ identification process:

- **Research gaps** (e.g., conceptual gaps, relationship knowledge gaps, methodology gaps);
- **Data gaps** (e.g., thematic, lack of appropriate spatial representations, lack of appropriate temporal representations);
- **Indigenous and local knowledge mobilization gaps**, where indigenous and local knowledge can be assumed to exist but is not available to assessment authors.

Other types of gaps can be identified through the assessments, which are different from knowledge gaps: operationalization gaps, corresponding to aspects limiting the operationalization of biodiversity knowledge into decision-making. This can refer to an information gap (lack of context dependent information), a resource gap (lack of means) or a capacity gap (lack of skills). If relevant to new knowledge programmers and funders, these will be used in the context of dialogues.

## **Key steps**

The objective is to ensure the development of a comprehensive overview of knowledge gaps based on the evidence reviewed in the chapters, for the second order draft of the chapters. Sections/tables on knowledge gaps will then be finalized and coherently organized in the final draft of the chapters.

The identification of knowledge gaps is mentioned from the very beginning of an assessment, to already raise awareness amongst IPBES experts of the need to identify knowledge gaps **in future stages**.

→ **At the first author meeting**, all experts receive a brief introduction highlighting why the collection of knowledge gaps is important and providing materials, including:

- The present guidelines;
- Possible formats for knowledge gaps and related sections in assessments (e.g., examples from other assessments); and
- A template to support the reporting of gaps by individual experts, if appropriate;

Experts of each chapter would be invited to keep this process in mind for future stages of their assessments and to keep track of gaps as the assessment progresses;

The assessment technical support unit may act as a contact point to facilitate the work and coordination between the task force on knowledge and data and assessment experts.

→ **At the second author meeting**, a further session is organized to remind experts of the process to identify knowledge gaps and to encourage them to start working on it more closely.

In the development of the **second order draft of each chapter**:

- **Assessment experts** (i) take stock of current advancement in knowledge gaps’ identification and (ii) report knowledge gaps identified within their respective chapter, possibly using/inspired by the dedicated template;
- **Chapter experts (as appropriate, coordinating lead authors, lead authors, and/or fellows)** work on developing the sections/tables on knowledge gaps;

→ **At the third author meeting**, a session around knowledge gaps is organized with relevant experts to discuss and plan for the last steps towards the finalizations of knowledge gaps sections. The final presentation of knowledge gaps in the assessment remains flexible and at the discretion of the experts (i.e., a knowledge gaps section could be included at the end of each chapter, and as key messages/tables

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<sup>1</sup> This definition was adapted from the one given in the following article: Mastrángelo, M.E., Pérez-Harguindeguy, N., Enrico, L. *et al.* Key knowledge gaps to achieve global sustainability goals. *Nat Sustain* 2, 1115–1121 (2019). <https://doi.org/10.1038/s41893-019-0412-1>.

in the chapter executive summaries or in the summary for policymakers of the assessment – see examples in part IV).

- ➔ **After the third author meeting**, further work is done by authors on updating and finalizing the knowledge gaps content for the final drafts of the chapters.

Additional sessions can also be organized along the lifetime of the assessment, e.g., during workshops to advance the summary for policymakers, where it can be relevant to discuss the synthetic format for gaps, as found appropriate by the assessment authors and technical support unit.

### III. Template for the collection of knowledge gaps

The template has been developed to support experts in the identification/compilation of knowledge gaps. It is proposed by the task force on knowledge and data to help structure the identification of knowledge gaps, and can be used as a source of inspiration by assessments. Please feel free to adapt it to the specific needs of your own assessment.

<b>Structure of the template for the collection of knowledge gaps</b>
<b>I. Contact sheet</b>
<ul style="list-style-type: none"> <li>- First name, last name, email;</li> <li>- IPBES role / assessment;</li> <li>- Expertise / background.</li> </ul>
<b>II. Template sheet</b>
<b>1. General information</b> <ul style="list-style-type: none"> <li>- Date of submission;</li> <li>- Date of revision, if appropriate;</li> <li>- In which chapter and section has the gap been identified?</li> </ul>
<b>2. General gap description</b> <ul style="list-style-type: none"> <li>- General description of the gap identified (<i>free text field</i>)</li> <li>- Description of the relative importance of the gap (<i>free text field</i>)</li> </ul>
<b>3. Description of the type of gap identified</b> <ul style="list-style-type: none"> <li>- Type of gap identified (<i>drop-down list</i>): <i>research gap, data gap, indigenous and local knowledge mobilization gap, operationalization gap</i></li> <li>- If research gap, please specify (<i>drop-down list</i>): <i>conceptual gap, relationship knowledge gap, methodology gap, other</i>;</li> <li>- If data gap, please specify (<i>drop-down list</i>): <i>thematic, lack of appropriate spatial representations, lack of appropriate temporal representations, other</i>;</li> <li>- If operationalization gap, please specify (<i>drop-down list</i>): <i>information gap, resource gap, capacity gap</i></li> <li>- Further indication on type of gap (<i>drop-down list</i>): <i>gap in existence, gap in availability</i>;</li> <li>- If gap in availability, please specify (<i>free text field</i>).</li> </ul>
<b>4. Description of the scale of the gap identified</b> <ul style="list-style-type: none"> <li>- Scale and scope of the gap identified (<i>drop-down list</i>): <i>national, regional (supra-national level), global, other</i>;</li> <li>- If regional, please specify (<i>drop-down list</i>): <i>Africa, Americas, Asia and the Pacific, Europe and Central Asia</i>;</li> <li>- If applicable, further indication on scale and scope (<i>free text field</i>).</li> </ul>
<b>5. Comments</b> <ul style="list-style-type: none"> <li>- Authors are invited to share any additional comment or information (<i>free text field</i>).</li> </ul>

## IV. Examples from IPBES assessments

### A. Sustainable use of wild species assessment

Sessions around knowledge gaps were organized during authors meetings and workshops to advance the summary for policymakers of the sustainable use assessment. One coordinating lead author (from chapter 6) volunteered to lead/coordinate the work and structure the table on knowledge gaps.

**Format** for knowledge gaps in the sustainable use of wild species assessment:

- Knowledge gaps sections were included in chapters 3, 4, 5 and 6 of the assessment.
- A table was included in the summary for policymakers, synthesizing the gaps identified in the different chapters. The gaps were classified by sector/theme.

Sector	Knowledge gaps (in data, indicators, inventories, scenarios)
<b>Data and information availability and access</b>	<ul style="list-style-type: none"> <li>● Data and information about wild species and their uses at scales compatible with those of their management {2.1}</li> <li>● Context-specific information about practices and uses and their outcomes {1.4, 3.3, 4.2, 6.5}</li> <li>● Long-term temporal and spatial studies, particularly for non-fishing practices {4.5}</li> <li>● Consistency among worldwide and regional databases concerning the harvest of wild species and the social components of their use {3.2.1.5}</li> <li>● Databases containing information on policies adopted by different levels of governance addressing sustainable use of wild species {3.2.1}</li> <li>● Information about the inter-linkages among different taxonomic groups of wild species, specific ecosystem functions, nature's contributions to people and human well-being {3.2.4, 3.5, 3.6.2}</li> <li>● Information on sources, quality assurance, safety and efficiency of traditional use of wild species {3.5}</li> <li>● Robust indicators at multiple temporal and spatial scales, particularly for gathering, logging and non-extractive practices {3.2.1, 3.3.2, 3.3.4, 3.3.5}</li> <li>● Indicators reflecting the social components of use of wild species (for all practices) {2.2, 2.3, 3.2, 6.4}</li> <li>● Strengthen consistency, breadth, and depth of documentation of threats and use &amp; trade classification schemes in the International Union for Conservation of Nature Red List of Threatened Species assessments {3.2.1, 3.2.2}</li> </ul>
<b>Assessment methods, models and scenarios</b>	<ul style="list-style-type: none"> <li>● Studies about the effectiveness of various policy instruments and tools (including certification schemes and other market mechanisms) {5.6}</li> <li>● Studies of ecosystem resilience and how resilience is affected by uses of wild species, particularly for practices other than fishing {4.5}</li> <li>● Studies addressing the interactions of multiple drivers of unsustainable uses {3.2.2, 6.5}</li> <li>● Methods which combine information from multiple knowledge systems {3.2}</li> <li>● Evaluation of the impacts of changes in social-ecological systems (especially their social components) on sustainable use of wild species {4.5, 5.3, 6.7}</li> <li>● Scenario studies for gathering, terrestrial animal harvesting and non-extractive practices {5.3, 6.5.2}</li> <li>● Scenario studies focusing on cultural, rights and equity aspects of use of wild species {5.6}</li> <li>● Archetype scenarios exploring use of wild species {5.6}</li> </ul>

<b>Indigenous and local knowledge</b>	<ul style="list-style-type: none"> <li>• Methods co-developed with indigenous peoples and local communities for weaving science and indigenous and local knowledge {3.5, 4.5}</li> <li>• Documentation of indigenous and local knowledge regarding sustainable use of wild species, observing free, prior and informed consent {3.5}</li> <li>• Monitoring processes and indicators co-produced with indigenous peoples and local communities {3.5, 4.5}</li> <li>• Scenarios co-produced with indigenous peoples and local communities, based on indigenous and local knowledge and values {5.11}</li> <li>• Approaches to support and revitalize indigenous and local knowledge and customary governance {4.5}</li> <li>• Capacity-building and support for indigenous peoples and local communities to conduct research, monitoring and governance to support and enhance the sustainability of the use of wild species {3.5, 4.5}</li> </ul>
<b>Multiple uses and interactions of uses with other pressures</b>	<ul style="list-style-type: none"> <li>• Interactions between ecological and social components of use of wild species {3.4.3, 5.4, 6.5}</li> <li>• Interactions among practices, such as logging, gathering, terrestrial animal harvesting and non-extractive practices {3.4}</li> <li>• Interactions between pollution, climate change, urbanization and human consumption of wild species {4.5}</li> <li>• Impacts of climate change on wild species distribution, the ecosystems they inhabit and policies addressing their use {3.5, 4.5}</li> <li>• Impacts of invasive species on sustainable uses of wild native species {4.5}</li> </ul>
<b>Practices</b>	<p><b>Fishing</b></p> <ul style="list-style-type: none"> <li>• Assessments of small-scale fisheries in coastal and inland areas {3.3.1}</li> <li>• Assessments of all types of fisheries in South and East Asia, Latin America and Africa {3.3.1}</li> <li>• Consistent differentiation between wild and non-wild species, especially for production, consumption and trade statistics {3.3.1, 3.3.4}</li> <li>• Life histories information for wild species {3.3.1}</li> <li>• Documentation about bycatch and discards {3.3.1}</li> <li>• Long time series for population status and harvest volumes {3.3.1}</li> <li>• Information on trade in ornamental fishes {3.3.1}</li> <li>• Studies on the social components of fishing, especially governance and equity considerations {5.4.2}</li> </ul> <p><b>Gathering</b></p> <ul style="list-style-type: none"> <li>• Information about the uses of wild plants, algae and fungi {3.2}</li> <li>• Information about trade in wild plants, algae and fungi {3.3.2, 3.5}</li> <li>• Studies of the effects of harvest techniques on wild plants, algae and fungi {3.3.2}</li> <li>• Information about urban gathering, especially for Asia and the Pacific regions {3.3.2}</li> <li>• Information on formal and informal governance systems {4.5}</li> <li>• Impacts of use of wild plants, algae and fungi on human health and food security {3.3.1, 3.3.2, 3.3.5}</li> <li>• Projections and scenarios on gathering of wild plants, algae and fungi {5.4.3}</li> <li>• Projections and scenarios of impacts of climate change on distributions of wild plants, algae and fungi in use and the traditional territories of indigenous peoples and local communities that rely on them {5.4.3, 5.5}</li> </ul> <p><b>Logging</b></p> <ul style="list-style-type: none"> <li>• Information on timber trade, especially species, sources (naturally regenerating <i>versus</i> plantation forests) and legality (legal <i>versus</i> illegal) of wild species entering markets {1.4.1, 3.3.4}</li> <li>• Consistent differentiation between naturally regenerating <i>versus</i> plantation sources of wood in production, consumption and trade statistics {3.3.1, 3.3.4}</li> </ul>

	<ul style="list-style-type: none"> <li>• Studies exploring interactions among multiple drivers of logging outcomes (e.g., climate change, agriculture and development) {3.3.4, 4.3.2.4, 4.5}</li> <li>• Studies exploring how context-specific factors affect the drivers of use of wood from naturally regenerating forests and their interactions {4.3.2.4, 4.5}</li> </ul> <p><b>Terrestrial animal harvesting</b></p> <ul style="list-style-type: none"> <li>• Information on harvest and trade of edible insects {3.3.3, 3.5}</li> <li>• Information on wild meat harvesting from understudied areas, especially from the Asian tropics {3.2.1, 3.3.3}</li> <li>• Information on the impacts of various forms of terrestrial animal harvesting in conjunction with other pressures on wild populations {3.3.3.2.4}</li> <li>• Empirical evidence for the link between hunting and conservation of landscapes {3.3.3.2.4}</li> <li>• Analyses of the identity and location of harvesting in trade of wild reptiles {3.3.5}</li> <li>• Impacts and role of green hunting and trophy hunting on the sustainable use and conservation of those wild species {3.3.3}</li> <li>• Scenarios related to environmental changes, particularly climate change {5.4.4}</li> </ul> <p><b>Non-extractive practices</b></p> <ul style="list-style-type: none"> <li>• Information about the species that are the focus of non-extractive practices across different regions {3.2}</li> <li>• Information on trends and sustainability of non-extractive practices {3.2}</li> <li>• Information on formal and informal governance systems {4.5}</li> <li>• Impacts of nature-based tourism on less charismatic species of wild flora and fauna {3.3.5}</li> <li>• Scenario studies on non-extractive practices {5.4.6}</li> </ul>
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## B. Values assessment

The work around knowledge gaps in the values assessment was coordinated by the assessment technical support unit and experts from chapter 6. They collected knowledge gaps from all chapters and also conducted a detailed analysis of the gaps with regard to various criteria, such as the type of gap, the focus of the gap, the decision cycle stage possibly concerned or stakeholders.

**The format** for presenting knowledge gaps in the values assessment appears as follows:

- An overview of the gaps identified is required in all chapters;
- One key message focuses on knowledge gaps in the Summary for policymakers;
- Chapters 6 presents a more detailed synthesis of gaps, linked to capacity dimensions.

Most pressing issues	Potential solutions
Conceptualization of nature's diverse values	Document the diverse values of nature for different sociodemographic groups, social-ecological contexts, spatial and temporal scales, and knowledge systems
Choice of valuation methods to support decision-making	Design valuation processes to fit decisions that lead to specific outcomes
Understanding notions of "value" and "valuation" for indigenous peoples and local communities	Make visible the values of indigenous peoples and local communities on their own terms
Ensuring the uptake of valuation results in decision-making	Document the uptake of valuation into decisions, the barriers and enablers of uptake, and the outcomes derived from uptake
Designing and operationalizing policy tools that consider nature's diverse values.	Document best-practice policy tools and their transformative change potential
Considering values and valuation as leverage points for transformative change	Assess how institutions can better embrace nature's diverse values and how sustainability-aligned values can be further mobilized
Understanding the role of values in future scenario planning and development	Document how nature's values play a role in future scenarios, and the role of sustainability-aligned values in shaping sustainability pathways
Considering justice perspectives in valuation	Analyse the role of power in value expression and how justice dimensions are influenced by valuation