

**DRAFT EXPLANATORY NOTE FOR THE KNOWLEDGE MANAGEMENT COMPONENT OF
THE POST-2020 GLOBAL BIODIVERSITY FRAMEWORK**

Note by the Executive Secretary

OVERVIEW OF THE KNOWLEDGE MANAGEMENT COMPONENT

Knowledge management is one of the critical means of implementation that will underpin the success of the post-2020 global biodiversity framework. The availability of quality biodiversity data, information and knowledge will be crucial for effective biodiversity planning, policy development, decision making, implementation, monitoring, review and reporting.

The goal of the knowledge management component is to facilitate and support effective implementation of the post-2020 global biodiversity framework by the global community through enhancing the generation, collection, organization, sharing and utilisation of data, information and knowledge. The component comprises four main elements: the people, processes, technology and content.

The target¹ is to ensure that by 2030 quality data, information and knowledge are readily available, as needed by policymakers, planners, decision makers, practitioners and the public at various levels, for the effective management of biodiversity.

Knowledge management should be considered together with the other means of implementation – capacity development, technical and scientific cooperation, communication and partnerships. Existing mechanisms and strategies contributing to different stages of the knowledge management cycle should also be expanded and improved.

I. INTRODUCTION

A. Background

1. The importance of information and knowledge management is recognized in the texts of various biodiversity-related conventions and processes and in the decisions of their governing bodies. For example, Article 17 of the Convention on Biological Diversity (CBD) requires Parties to facilitate the exchange of relevant information, from all publicly available sources, including results of technical, scientific and socio-economic research, as well as information on training and surveying programmes, specialized knowledge, indigenous and traditional knowledge. Article 18 directed the establishment of a clearing-house mechanism to promote and facilitate technical and scientific cooperation.
2. Article 20 of the Cartagena Protocol on Biosafety established the biosafety clearing-house to facilitate the exchange of scientific, technical, environmental and legal information on, and experience with, living modified organisms and assist Parties to implement the Protocol. Article 14 of the Nagoya Protocol also established an access and benefit-sharing clearing-house to serve as a means for sharing of information related to access and benefit-sharing.
3. CITES requires Parties to provide types of information in the export permits and in their periodic reports on the implementation of the Convention and to make information referred to in paragraph 7 of Article VIII available to the public (Articles VI and VIII). The Ramsar Convention (Articles 3 and 6) also require Parties to seek and share key information, including information regarding changes in the ecological character of wetlands included in the List of Wetlands of International Importance (the “Ramsar List”). Likewise, the Convention on Migratory Species requires Parties to, inter alia, exchange of information on

¹ Target 18, as contained in the zero draft of the post-2020 global biodiversity framework (CBD/WG2020/2/3) states: Promote education and the generation, sharing and use of knowledge relating to biodiversity, in the case of the traditional knowledge, innovations and practices of indigenous peoples and local communities with their free, prior and informed consent, ensuring by 2030 that all decision makers have access to reliable and up-to-date information for the effective management of biodiversity.

the migratory species concerned, including results of research and of relevant statistics, as well as information on substantial threats to the migratory species (Article V).

The Strategic Plan for Biodiversity 2011-2020

4. The Strategic Plan for Biodiversity 2011-2020, includes Goal E: to enhance implementation through participatory planning, knowledge management and capacity-building and Aichi Target 19 states that “*by 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.*” The Strategic Plan recognised that its achievement would require enhanced support mechanisms including the generation, use and sharing of knowledge. It also acknowledged that, collectively, Parties and stakeholders involved in implementing the Convention have a wealth of experience. It also recognized that many useful good practice cases, tools and guidance had been developed. In addition, it acknowledged that there is additional useful information beyond this community.

5. The Strategic Plan for Biodiversity 2011-2020 called for establishment of a biodiversity knowledge network, including a database and network of practitioners, to bring together this knowledge and experience and to make it available through the clearing-house mechanism to facilitate and support enhanced implementation of the Convention.

The Post-2020 Global Biodiversity Framework

6. During the development of the post-2020 global biodiversity framework (GBF), the importance of enhancing knowledge and information management has been a key area of focus. Like capacity building, resource mobilization, and communication, knowledge management has been identified as one of the critical means of implementation for the post-2020 GBF, the Convention as well as its Protocols.

7. In decision 14/25, the Conference of the Parties requested the Executive Secretary to develop, in consultation with the informal advisory committees to the Clearing-House Mechanism, the Biosafety Clearing-House and the Access and Benefit Sharing Clearing-House, a knowledge management component as a part of the preparatory process for the post-2020 global biodiversity framework.

8. In response to this request, the present document outlines draft elements of the knowledge management component of the post-2020 global biodiversity framework and possible strategies to operationalise it. Section I provides an introduction and a conceptual framework for the knowledge management component, section II outlines the rationale, objectives and expected impact of the knowledge management component; section III presents strategies to enhance knowledge management in support of the post-2020 GBF and section IV describes possible options for an implementation framework. Background information on the meaning and scope of knowledge management and an overview of the current biodiversity knowledge management practitioners are included in the annex.

9. In keeping with the global nature of the post-2020 global biodiversity framework, the knowledge management component is intended to guide knowledge management by the biodiversity community, including biodiversity-related Conventions, processes and organizations. The proposed actions will be implemented or coordinated, as appropriate, by different actors including Parties to the various conventions, Convention secretariats, partners and other stakeholders.

10. The component complements related mechanisms and strategies already in place or in-process of being developed to support the implementation of the post-2020 global biodiversity framework. These include the framework for a global communications strategy, the long-term strategic framework for development, the proposals to enhance technical and scientific cooperation in support of the post-2020 GBF and the mechanisms for reporting, assessment and review of implementation.

B. Elements of the Knowledge Management Component

11. The knowledge management component comprises four main elements: the people, processes, technology and content.

People: The creators, custodians, managers, curators and users of biodiversity knowledge are the foundation of the knowledge management component. It is important to clarify the roles, responsibilities and expectations of various stakeholders and to recognize and reward knowledge champions. It is also important to promote and nurture a culture of knowledge sharing across functional and geographical areas.

Processes: This includes the processes, procedures and policies guiding knowledge generation, capture, management, sharing and utilization. This also entails vision, leadership and oversight, alignment of knowledge management with goals and provision of the required resources.

Technology: Technology plays a key role in delivering and supporting knowledge management services. This includes technological tools, systems² and platforms that enable relevant actors (the people) to collect, analyse, organise, store, retrieve and share knowledge related to biodiversity.

Content: This entails the scope of the biodiversity knowledge content and how it is managed - the taxonomy and metadata, the tools and templates, and the analysis and validation (for quality assurance), the cataloguing, tagging and indexing, digitization and organization of the information and knowledge resources to facilitate easy search and retrieval.

12. These four elements are interdependent and need to be addressed in a balanced and complementary manner. Knowledge management would not be effective if only the technology aspects were addressed and not the process and people-related aspects.

C. Scope of the Knowledge Management Component

13. The scope of this component encompasses data, information and knowledge relevant for the conservation and sustainable use of biological diversity. It is not limited to scientific and technical data, for example species data, but also include implementation-related data and information, such as the status of or experiences and lessons learned in development and implementation of biodiversity national policies, plans and programmes. The decisions, recommendations and official documentation created by biodiversity-related Conventions, other Rio conventions and related processes can also be considered information and knowledge objects.

14. The component includes actions to guide, strengthen and enable governments and non-government stakeholders to maximise the use of existing information and knowledge management systems, tools and mechanisms of biodiversity-related conventions, processes and organizations. These include the clearing-house mechanism of the Convention on Biological Diversity, the Biosafety Clearing-House and the Access and Benefit-sharing Clearing-House, the Ramsar Sites Information Service³, and UN Information Portal on Multilateral Environmental Agreements (InforMEA).

15. The component also proposes actions to foster coordination, collaboration and complementarity between initiatives of international organizations and processes supporting the generation, capture, management and use of biodiversity-related data and information, such as: UN Environment⁴, IPBES task force on knowledge and data, International Union for Conservation of Nature (IUCN) Red List of threatened species, UN Programme on Reducing Emissions from Deforestation and Forest Degradation (UN REDD), Global Biodiversity Information Facility (GBIF), Encyclopedia of Life (EOL), Consortium for the Barcode of Life (CBOL), the Group on Earth Observations Biodiversity Observation Network (GEO BON), the Digital Observatory for Protected Areas (DOPA), the Data and Reporting Tool (DaRT), and the Knowledge Hub of the United Nations Convention to Combat Desertification. These are described in Annex II below.

² These technologies could include web content management systems (CMS), electronic document and records management systems (EDRMS), collaboration tools, search engines, classification tools, and portals. This could also include hard copy systems, such as libraries and other information centres.

³ <https://rsis.ramsar.org/>

⁴ <https://www.unenvironment.org/explore-topics/environment-under-review/what-we-do/information-management>.

II. RATIONALE, OBJECTIVES AND EXPECTED IMPACT OF THE KNOWLEDGE MANAGEMENT COMPONENT

16. The overall goal of the knowledge management component is to facilitate and support the effective implementation of the post-2020 global biodiversity framework through enhancing the generation, collection, organization, sharing and utilisation of relevant data, information and knowledge by the global community. This would require building a culture of knowledge sharing and fostering collaborative networks and online communities of practice. It would also require analysing, sharing and leveraging experiences and lessons learned from various biodiversity knowledge management initiatives.

A. Rationale for the Knowledge Management Component

17. Knowledge management is an essential prerequisite for the successful implementation of the post-2020 global biodiversity framework and the achievement of its goals and targets. Easy and timely access to the best available, fit-for-purpose biodiversity data, information and knowledge assets is critical for effective planning, policy formulation, decision making and implementation.

18. While the business case for knowledge management is clear, many governments and organizations still face several challenges in implementing effective processes and initiatives for knowledge management. In many developing countries and countries with economies in transition, data, information and knowledge on biodiversity that conservation practitioners, indigenous peoples and local communities, and scientists require is limited. Furthermore, much of what is available is fragmented, difficult to find, or inaccessible.

19. An expert meeting convened by the Cambridge Conservation Initiative from 10 to 12 April 2018 in Cambridge, United Kingdom, to advance understanding of the need to base development of the post-2020 global biodiversity framework on available evidence noted, *inter alia*, that there are significant data, information and knowledge available, but they are often not readily accessible to those who could use it to good effect.⁵ for various reasons including journal paywalls, confidentiality, or simply not knowing it exists or not knowing how to use it. Participants underlined the need to facilitate ‘discovery’ of relevant data and information from all sources and to facilitate its use. They also highlighted the potential value of developing a knowledge generation or research strategy to clearly identify the knowledge needed to support implementation of a post-2020 GBF. Finally, the meeting underscored need to include evidence from different knowledge systems, and in particular traditional knowledge systems, in any knowledge generation or research strategy if it is to be effective.

20. The knowledge management component of the post-2020 global biodiversity framework seeks to address some of the above issues, including the barriers that prevent the effective utilization of existing biodiversity data, information and knowledge, by leveraging existing knowledge management initiatives and enhancing global coordination and collaboration. Such efforts call for recognizing and optimizing the contributions of various government and non-government institutions, regional and internal organizations, researchers, practitioners and other stakeholders involved in biodiversity knowledge management.

B. Specific objectives

21. The specific objectives of the knowledge management component are:

(a) To promote and nurture a culture of sharing information and knowledge across the biodiversity-related Conventions, organizations and other stakeholders.

(b) To create enabling environments and mechanisms for biodiversity knowledge management, including through enhanced interoperability and harmonization of data and information.

(c) To leverage existing biodiversity knowledge management initiatives and networks as part of a coordinated and collaborative multi-stakeholder process.

⁵ Document CBD/SBI/2/INF/33: <https://www.cbd.int/meetings/SBI-02>

(d) To improve discoverability of biodiversity-related data and information across multiple sources, and as necessary promote integration of data, information and knowledge from multiple sources.

(e) To encourage relevant stakeholders to participate in biodiversity knowledge networks.

(f) To strengthen the capacities of all relevant stakeholders to access and utilise existing data, information and knowledge at the national, regional and international levels to effectively support effective planning, policy and decision-making and implementation.

22. These objectives are complementary to those set out in the long-term strategic framework for capacity development and in the proposals for enhancing technical and scientific cooperation.⁶

C. Expected outcomes

23. The implementation of the knowledge management component is expected to result in:

(a) Increased availability and accessibility of biodiversity-related data, information and knowledge at all levels.

(b) Increased uptake and utilization of data, information and knowledge to support the implementation of the post-2020 global biodiversity framework.

(c) Increased capacity of governments and relevant stakeholders to capture, manage and utilize biodiversity-related data, information and knowledge; and

(d) Increased number of active biodiversity knowledge management support networks and communities of practice.

24. Ultimately, it is expected that the above improvements will enable governments, indigenous peoples and local communities, and all stakeholders to, as appropriate:

(a) Improve implementation and decision making through more effective use of data, information and knowledge;

(b) Increase efficiency by accessing and leveraging previous work rather than repeating it, and learning from the experiences of others;

(c) Reduce inefficiencies in service delivery by getting the information needed in a timely manner or by reducing the amount of time spent searching for information;

(d) Improve communication, professional development and organizational growth by increasing learning across organizations; and

(e) Facilitate innovation by leveraging existing knowledge resources to create new products.

III. STRATEGIES TO ENHANCE BIODIVERSITY KNOWLEDGE MANAGEMENT

25. This sub-section outlines strategies to enhance knowledge management in support of the post-2020 global biodiversity framework. It describes the proposed strategies for improvement at each stage of the knowledge management cycle, namely:

(a) Promoting knowledge generation;

(b) Facilitating knowledge discovery and collection;

(c) Enhancing knowledge organization and sharing; and

(d) Promoting the effective use/application of knowledge.

⁶ SBSTTA 23 recommendation 6.

A. Promoting knowledge generation

26. Knowledge generation encompasses the creation and advancement of new knowledge and building of an evidence base, primarily through research and academic initiatives. It also includes the synthesis and analysis of information and reports received from governments, relevant organizations and other sources. Biodiversity-related information and knowledge are also generated through other processes such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) assessments, FAO Global Forest Resources Assessments, the Global Biodiversity Outlook, UNEP Global Environment Outlook and others.

27. Key strategic actions to enhance knowledge generation include the following:

- (a) Identification of gaps in available knowledge and options for addressing them;
- (b) Expansion of work with relevant organizations and institutions to promote knowledge generation;
- (c) Enhancement of outreach to and collaboration with research and academic communities and knowledge generating institutions to access biodiversity research data, information and knowledge;
- (d) Developing local and national capacity for knowledge generation and citizen science by incentivizing the collection of data and information at the local levels, especially relating to the Protocols and their mandated data collection functions.

B. Facilitating knowledge discovery and collection

28. Knowledge discovery and collection⁷ are essential elements of knowledge management. As knowledge generation grows, massive amounts of data and information are stored in digital libraries and database systems across organizations around the world. These need to be identified and made accessible. Key challenges with knowledge collection include understanding the breadth of what is already being collected across the spectrum of sources and identifying and keeping track of relevant knowledge sources. Some of these sources are publicly available, and others are maintained as for-pay and/or private resources.

29. There are a number of ongoing efforts to bring together biodiversity information and knowledge.⁸ For example, UNEP-WCMC has developed a *Compendium of guidance on key global databases related to biodiversity-related conventions* which describes resources available for researchers and policymakers. However, these efforts need to be expanded to match the scale and ambition of the post-2020 framework.

30. Key strategic actions to foster effective management of knowledge collection include the following:

- (a) Development or enhancement of web-based tools and initiatives, such as those compiled by UNEP-WCMC⁹, to identify and collect biodiversity information and knowledge from various sources in a more interactive, current and user-friendly manner.
- (b) Promotion of knowledge discovery tools and techniques, such as data mining and machine learning, as appropriate.
- (c) Engagement of relevant stakeholders (knowledge creators, brokers and users), including implementing agencies, nature conservation organizations, academic institutions, and other relevant stakeholders at the national and sub-national levels in the creation and collation of knowledge.
- (d) Identification and sharing, where authorized, of traditional knowledge from indigenous and local communities remains a key gap, which requires additional studies. The Working Group on Article 8(j), and the IPBES task force on indigenous and local knowledge could play a role in this regard.

⁷ Knowledge collection involves the searching, location, identification and acquisition of knowledge within and outside an organization.

⁸ Some of the efforts are outlined in Decision IPBES-7/1.

⁹ <https://www.unep-wcmc.org/resources-and-data/biodiversitysynergies>.

C. Enhancing knowledge organization and sharing

31. The knowledge generated or collected must be organized and catalogued using appropriate metadata and descriptors for easy searchability, accessibility and retrieval. Key players such as GBIF, GEO-BON, InforMEA and UNEP-WCMC have developed standards that can be further elaborated and shared. Increasing access to information can be addressed by ensuring full and complete metadata tagging, including subject tagging of knowledge objects. Consistent use of shared terminology increases findability, as does full-text indexing. Increasing the interoperability of search systems and standardization and the use of common descriptors will allow for better findability of information.

32. While there are many existing collections of biodiversity data, information and knowledge, finding and sharing them remains difficult. In addition, not all information is made available in an open-access manner, making it difficult for all stakeholders, most especially for those in developing countries to access and use it. Further work is needed to make it easier for users to find and access available information and knowledge in compressible formats. The latter could be achieved through taking advantage of modern technologies to enhance data and information integration and visualization of search results. Following international standards and best practices, biodiversity-related convention secretariats have developed a variety of “common formats” that are used to describe frequently collected information. These common formats can be adapted, shared with and used by external audiences, if needed.

33. Key strategic actions to improve knowledge organization and sharing include the following:

- (a) Continued improvement of metadata quality, tagging and depth to allow for increased findability.¹⁰ Additional metadata tagging of objects from biodiversity-related and Rio conventions through InforMEA and similar initiatives.
- (b) Development, publicization and promotion of standards for metadata quality and tagging relating to biodiversity, in conjunction with IPBES, GEF, InforMEA and other stakeholders, to ensure quality and compatibility.
- (c) Improvement of interoperability of information and knowledge systems of biodiversity-related Conventions and other information providers across the biodiversity community.
- (d) Promotion of outreach for and development of bioinformatics and descriptive metadata training modules, in conjunction with existing capacity-development projects and plans at international, national and sub-national levels, aimed at increasing related competencies.
- (e) Promotion of voluntary guidance to improve accessibility to biodiversity data and information.
- (f) Strengthening the capacity of Governments in efficiently managing and sharing information and knowledge across conventions, *inter alia*, through making use of tools, such as the Data Reporting tool (DaRT) and the adoption of coherent and synergistic approaches.

D. Promoting the effective use of knowledge

34. As noted in section 1 above, collectively, governments, organizations and other stakeholders have a wealth of biodiversity data, information and knowledge stored in databases, libraries and other repositories. However, this wealth of data is only of value if it is shared and effectively used to support biodiversity planning, policy development, decision making, implementation, monitoring, review and reporting processes.

¹⁰ With reference to findability and accessibility, Parties are reminded of the FAIR (Findable, Accessible, Interoperable and Re-usable) Guiding Principles for Scientific Data Management and Stewardship, see <https://www.go-fair.org/fair-principles/>. Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* 3, 160018 (2016). <https://doi.org/10.1038/sdata.2016.18>. Parties are also reminded of the CARE principles for Indigenous Data Governance (Collective Benefit, Authority to Control, Responsibility, Ethics), Research Data Alliance International Indigenous Data Sovereignty Interest Group. (September 2019). “CARE Principles for Indigenous Data Governance.” The Global Indigenous Data Alliance. <https://www.gida-global.org/>.

35. Various initiatives such as IPBES and the Connect Project¹¹ have made progress in providing support for governments and stakeholders to integrate biodiversity data into decision making. The Connect Project has the objective to ensure biodiversity is taken into account in decision making across government sectors by improving development decision makers' access to and use of biodiversity information and embedding biodiversity information within national development decision making processes. Such initiatives need to promote contextualization and utilization of existing information knowledge to support policy, planning, decision-making, implementation, monitoring and reporting.

36. Key strategic actions to foster effective utilization of information and knowledge include:

- (a) Promotion and facilitation of the sharing of experience in effective use of information and knowledge, including through communities of practice.
- (b) Engagement of a broader range of stakeholders in promoting the utilization and application of existing information and knowledge, and the development of new knowledge.
- (c) Creation of mechanisms and initiatives and enhancing existing ones to increase the uptake of biodiversity data, information and knowledge into the policy and decision-making processes.
- (d) Establishment of linkages between scientific networks and communication expertise to enable the translation of science outcomes to knowledge products.

IV. POSSIBLE OPTIONS FOR IMPLEMENTATION

37. The knowledge management component will be operationalised by governments and relevant stakeholders in line with their strategic priorities to implement the post-2020 global biodiversity framework. Possible actions to facilitate the implementation of this component are presented in Annex 1.¹² These build on the key actions for enhancing synergies and cooperation among the biodiversity-related conventions and international organizations in the area of information and knowledge management identified in CBD COP decision XIII/24.¹³ The actions will be implemented in manner that is complementary to the other means of implementation, including the long-term strategic framework for capacity development, the proposals to strengthen technical and scientific cooperation, the framework for a global communications strategy, and the mechanisms for reporting, assessment and review of implementation.

38. Enhanced knowledge management will require effective collaboration, cooperation and coordination among governments and relevant organizations in biodiversity data, information and knowledge processes. It may also require a mechanism(s) to provide strategic advice, guidance and recommendations on operational matters to governments and other key actors (including knowledge creators, managers, brokers, practitioners and users) involved. Such a mechanism could be:

(a) An existing advisory committee or sub-committee, such as the Steering Committee of the MEA Information and Knowledge Management Initiative led by UNEP;¹⁴

(b) An advisory group, such as the Informal Advisory Group on Technical and Scientific Cooperation¹⁵, to be established pursuant to CBD COP decision 14/24 B, paragraphs 5, 8 and 9 for the effective implementation of existing programmes and initiatives; and/or

(c) An informal network, such as the Global Alliance for Biodiversity Knowledge¹⁶, which brings together institutions, agencies, organizations, researchers and communities working on the collection, curation or sharing of biodiversity data, information and knowledge information.

¹¹ <https://www.connectbiodiversity.com/>.

¹² Participants in the Discussion Forum on the Preparation of the Knowledge Management Component of the Post-2020 Global Biodiversity Framework will be invited to elaborate possible areas for action and potential lead organizations.

¹³ CBD/COP/DEC/XIII/24 : <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-24-en.pdf>.

¹⁴ <https://www.informea.org/en/about>

¹⁵ <https://www.cbd.int/doc/recommendations/sbstta-23/sbstta-23-rec-06-en.pdf> (See Annex II)

¹⁶ <https://www.biodiversityinformatics.org/>

ANNEX I
POSSIBLE STRATEGIC ACTIONS TO FACILITATE THE IMPLEMENTATION OF THE
KNOWLEDGE MANAGEMENT COMPONENT

Key Area	Strategic action	Potential Contributors¹⁷
A. Capacity-building in data, information and knowledge management	1. Strengthen the capacity of relevant institutions in bioinformatics, information and knowledge management, including through education, training and mentoring of experts and young scientists	Parties, UNEP-WCMC, IPBES
	2. Support governments to put in place enabling policies and laws, institutional arrangements and incentives for knowledge management	UNEP, IUCN
	3. Provide information and guidance on knowledge management and national database development, and share experience in data access and use	UNEP-WCMC, InforMEA, GBIF
	4. Support governments and, in accordance with national legislation, relevant stakeholders, in accessing existing knowledge sources	Convention Secretariats, InforMEA
	5. Undertake an analysis of gaps in existing information and knowledge management tools and approaches supporting biodiversity management efforts	InforMEA, UNEP-WCMC, IPBES, Convention Secretariats
B. Network and partnership development	1. Catalyse and strengthen international and regional networks on biodiversity-related data, information and knowledge management	UNEP-WCMC,
	2. Promote collaboration in biodiversity data, information and knowledge-sharing, including enhancing harmonization and interoperability between relevant information systems initiatives	InforMEA, Convention secretariats
	3. Enhance biodiversity monitoring through cooperation to improve the acquisition, delivery and use of Earth observation data and related services	GEO-BON,
	4. Identify, publicize, link and strengthen centres of expertise, communities of practice and other knowledge sources	Parties, Convention Secretariats
	5. Enhance outreach and collaboration among key stakeholders – academia, indigenous peoples and local communities, sub-national governments and national government institutions	Parties
C. Identification and promotion of best practices and resources	1. Facilitate the sharing of relevant information, success stories and best practices in information and knowledge management	Convention Secretariats
	2. Identify, map and publicize existing relevant biodiversity data, information and knowledge sources	IPBES, UNEP-WCMC
	3. Identify, promote and facilitate the implementation and scaling up of innovative knowledge management tools	
	4. Promote the use of relevant case studies on information management	UNEP-WCMC, Convention Secretariats

¹⁷ Potential contributors could include Parties and stakeholders supporting or actively involved in the generation, collection, management and exchange of biodiversity-related data, information and knowledge.

ANNEX II

BACKGROUND INFORMATION

A. Meaning and scope of knowledge management

1. In the context of this component, knowledge management encompasses a range of processes, strategies and practices through which biodiversity knowledge is deliberately and systematically generated, discovered and collected, organized/curated, stored, shared and used/applied to achieve biodiversity-related objectives and outcomes. Such objectives may include informed policy development, decision making, planning and implementation or ongoing organizational learning through the collection and sharing of best practices and lessons learned from past activities in order to inform or improve future activities.

2. To effectively operationalise the knowledge management component, it is important to have common working descriptions of the relevant terminology, including knowledge, information, data and other related terms. There are no universally agreed definitions for these terms but for the purpose of this component, the descriptions below, based on the Data, Information, Knowledge and Wisdom (DIKW) hierarchy (see Figure 1 below)¹⁸, will be used.¹⁹

- (a) *Data* can be thought of as sets of quantitative or numerical figures, discrete raw facts or observations, which are unorganized and unprocessed and often have no meaning on their own because of lack of context and interpretation. In a scientific context, raw data are generally measurements from experiments or observations.
- (b) *Information* can be referred to as organized or structured data that is contextualised and processed in such a way that it has relevance for a specific purpose or context, and is therefore meaningful, useful and relevant.
- (c) *Knowledge* may be referred to as the know-how, understanding, experience and insight. It is taken to entail information having been processed, organized or structured in some way, or else as applied or put into action leads to an understanding of processes, concepts and contexts, and as a result may be specific to particular individuals or user communities.
- (d) *Wisdom* could be referred to as human intuition, understanding, common sense and insight based on years of experience, repeated deliberation, and rational application of knowledge. Wisdom is often codified into beliefs, traditions, philosophies and principles. Most of the traditional knowledge of indigenous peoples and local communities relevant for the conservation and sustainable use of biological diversity could be considered “wisdom”.

3. The concepts of data, information, knowledge, and ultimately, wisdom can be visualized in form of a pyramid whereby data plays the foundational role and is transformed into information, and information is transformed into knowledge. The interplay between data, information and knowledge is important and should be considered as the knowledge management component of the post-2020 global biodiversity framework is planned and implemented.

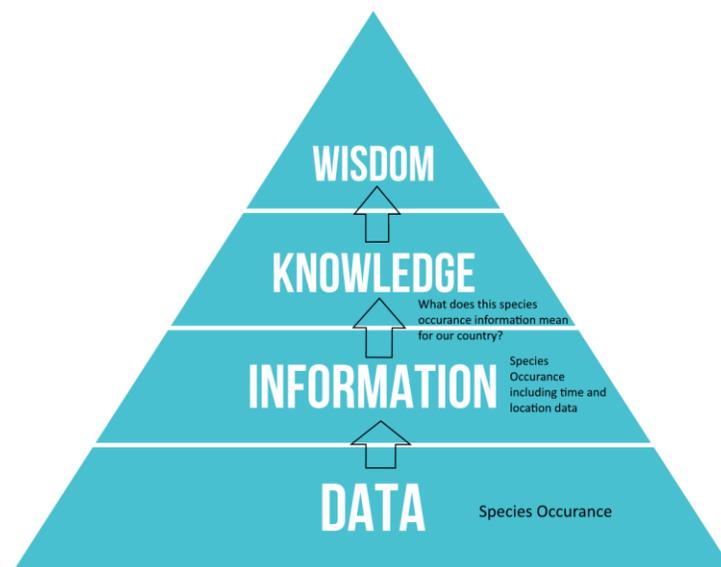
4. From the above definitions, it is clear that knowledge management is broader than information management, data management and other specific disciplines such as records management, document management, content management and others that contribute to and facilitate the generation, collection, organization, storage and sharing of knowledge.²⁰ While these terms are sometimes used interchangeably, it is important to recognize that in this document these latter activities are considered to be constituent elements that contribute to different stages of the knowledge management cycle.

¹⁸ Source: https://en.wikipedia.org/wiki/DIKW_pyramid.

¹⁹ Additional definitions can be found in document UNEP/CBD/COP/11/INF/8.

²⁰A general overview can be found from: https://en.wikipedia.org/wiki/Information_management, <https://lac-group.com/blog/digital-asset-management-vs-content-management-vs-knowledge-management/>.

Figure 1: The Data, Information, Knowledge and Wisdom (DIKW) Pyramid



B. Overview of the current biodiversity knowledge management landscape

5. The fourth edition of Global Biodiversity Outlook (GBO-4) concluded, with regards to Aichi Biodiversity Target 19, that significant advances have been made in building systems to share data, information and knowledge on biodiversity but that further efforts are needed on investment in data mobilization and the coordination of models and technologies that can be readily applied to decision-making. A final assessment of the progress made towards Aichi Biodiversity Target 19 is contained in the fifth edition of the Global Biodiversity Outlook.

6. The knowledge management component of the post-2020 global biodiversity framework would seek to synergize and leverage relevant existing knowledge management initiatives and processes, among others, to support effective implementation of the post-2020 GBF. Such initiatives and processes may include²¹:

- (a) *Clearing houses under the Convention and its Protocols*: Under the Convention on Biological Diversity, many knowledge management activities have been carried out within the context of the programme for the Clearing-house Mechanism.²² While many of the tasks in that programme of work have been implemented, there are areas that still need strengthening. In addition, knowledge management activities under the Cartagena and Nagoya Protocols are undertaken under the auspices of the Biosafety Clearing-House and the Access and Benefit-Sharing Clearing-House programmes.
- (b) *IPBES Task Force on Knowledge and Data*²³: The IPBES task force on knowledge and data has increased focus on knowledge creation and management in the biodiversity sphere. During 2019, a new work programme for the task force was adopted and the task force reconstituted. The IPBES 2030 work programme includes “strengthening the knowledge foundations” as one of its six objectives to promote the generation of knowledge and management of data on biodiversity and ecosystem services.²⁴ The inputs, resources and policies arising from the task force inform the development and implementation of this strategy. Additionally, the IPBES task force on indigenous and local knowledge systems acts as an important resource to ensure the inclusion of all knowledge systems into biodiversity policymaking and planning.

²¹ This list is not exhaustive and is not presented in any order of importance or priority

²² These activities are defined in document UNEP/CBD/COP/11/31.

²³ <https://ipbes.net/knowledge-data>

²⁴ IPBES (2020): IPBES Data Management Policy ver. 1.0. Task Force on Knowledge and Data, Krug, R.M., Omare, B., and Niamir, A. (eds.) IPBES secretariat, Bonn, Germany. <http://dx.doi.org/10.5281/zenodo.3551079>

- (c) *The Multilateral Environmental Agreements Information and Knowledge Management (MEA-IKM) Initiative*²⁵: For more than ten years, the MEA-IKM Initiative has been supporting knowledge management across multilateral environmental agreements. Its UN Information Portal on Multilateral Environmental Agreements (InforMEA) has developed harmonized and interoperable information systems for the benefit of Parties to the various MEAs and the environment community at large. The Initiative is facilitated by the UN Environment, financially supported by the European Union. The biodiversity-related conventions and Rio conventions are well-represented among the stakeholders for the project. Recent focus areas have included development of e-learning courses, development of a shared terminology base for document tagging, and support to technical work for interoperability and information sharing.
- (d) *Data and Reporting Tool (DaRT)*²⁶: DaRT is a Party-led initiative, implemented by UNEP in collaboration with SCBD (decision 14/25) and financially supported by the European Union and Switzerland. It supports Parties to effectively use synergies in national reporting across conventions and the SDGs by providing them with private and secure national working spaces to collect, organize, store and share information. This information is to monitor and verify progress in national implementation and to report thereon, to conduct gap analyses of implementation actions and/or to revise or update related strategies and action plans. DART draws from InforMEA infrastructure and its approach to connecting data sources among the different MEAs and supports channelling global/regional knowledge directly to national users. DART is also the primary space for mapping between strategies from which information will be permeating into other tools.
- (e) *The UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)*: UNEP-WCMC is an active participant in increasing access to biodiversity knowledge. It works with scientists and policy makers worldwide to place biodiversity at the heart of environment and development decision-making. UNEP-WCMC provides regular support to projects that work with a variety of actors to increase access and awareness to biodiversity-related information, including the development of reports on effective knowledge use and online tools to support implementation.
- (f) *Future Earth (formerly known as DIVERSITAS)*: Future Earth is an international research program which aims to build knowledge about the environmental and human aspects of global change and to find solutions for sustainable development, through its bioDISCOVERY international research programme, is fostering collaborative interdisciplinary activities on biodiversity and ecosystem science by advancing the use of observations, indicators and scenarios and models to support policy and decision-making for informed biodiversity management.²⁷
- (g) *The Catalogue of Life (CoL)*²⁸: The CoL is the most comprehensive and authoritative global index of species currently available. It consists of a single integrated species checklist and taxonomic hierarchy. The Catalogue holds essential information on the names, relationships and distributions of over 1.8 million species. It supports the major biodiversity and conservation information services such as GBIF (the Global Biodiversity Information Facility), the Encyclopedia of Life and the IUCN Red List of threatened species.
- (h) *The Global Biodiversity Information Facility (GBIF)*: GBIF is an international network and research infrastructure aimed at providing anyone, anywhere, open access to data about all types of life on Earth. The GBIF network of participating countries and organizations, working through participant nodes, provides data-holding institutions around the world with common standards and open-source tools that enable them to share information about where and when species have been recorded.
- (i) *Encyclopedia of Life (EOL)*²⁹: EOL is a global bioinformatics initiative that gathers, generates, and shares knowledge about life on Earth in an open, freely accessible and trusted manner via a digital platform. It identifies sources of biodiversity knowledge that are legally and practically shareable,

²⁵ <https://www.informea.org/en/about>

²⁶ <https://dart.informea.org/about>

²⁷ See details at: <https://futureearth.org/networks/global-research-projects/biodiscovery/>

²⁸ <https://www.catalogueoflife.org/>

²⁹ <https://eol.org/>

enriches their structure using modern data tools in order to integrate them with other forms of knowledge, aggregates them into a combined knowledge base and provides access to them using faceted search tools and data services in commonly used formats. It also collaborates with other knowledge hubs worldwide to support interoperability and sharing.

- (j) *Global Biodiversity Informatics Outlook (GBIO)*: GBIO³⁰ was released after a global conference on biodiversity informatics held in 2012. A follow-up conference was held in 2018 to review progress made towards achieving the goals set out in the GBIO. While the document is fairly old, the core tenets remain useful and can continue to influence work around the knowledge management aspects of the post-2020 global biodiversity framework. A global Alliance for Biodiversity Knowledge³¹ has been formed and can provide a good mechanism to align efforts to deliver current, accurate and comprehensive data, information and knowledge on the world's biodiversity.
- (k) *The Group on Earth Observations Biodiversity Observation Network (GEO BON)*³²: GEO BON has a mission to improve the acquisition, coordination and delivery of biodiversity observations and related services to users including decision makers and the scientific community. GEO BON facilitated the development or enhancement of at least 25 national biodiversity observation systems, representing most of the Earth's major biomes, that are coordinated and can contribute to regional and global biodiversity assessments. In addition, GEO BON has developed tools and products to distribute and utilize the gathered observations.
- (l) *The Global Environment Facility (GEF)*: The GEF has also developed a knowledge management approach³³ and has a focus on knowledge management as a core component of their work. The GEF finances project, programs and initiatives that underpin the generation and exchange of knowledge around global environmental issues, facilitating the capture, synthesis, transfer and uptake of this knowledge within and beyond the GEF Partnership.
- (m) *The Marine Biodiversity Observation Network (MBON)*³⁴: The Marine Biodiversity Observation Network (MBON), a global initiative composed of regional networks of scientists, resource managers and end-users, works to integrate data from existing long-term programs to improve our understanding of changes and connections between marine biodiversity and ecosystem functions.
- (n) *Biodiversity Information Standards (TDWG)*³⁵: TDWG, also known as the Taxonomic Databases Working Group, a non-profit scientific and educational association affiliated with the International Union of Biological Sciences, focuses on the development of standards that facilitate the structuring, maintenance and sharing of biological/biodiversity data. These include the Darwin Core (DwC), Access to Biological Collections Data (ABCD) schema, the Audubon Core (Biological Multimedia Metadata Standard), and the Taxonomic Concept Transfer Schema.

7. At its twenty-first meeting, the Subsidiary Body on Technical, Technological and Scientific Advice requested the Executive Secretary, when preparing the draft post-2020 global biodiversity framework, to ensure that this framework is based on the best available evidence (Recommendation XX/1, paragraph 8). An international expert meeting, "Framing the Future for Biodiversity: Effective use of knowledge in developing the post-2020 global biodiversity framework"³⁶, resulted in a document entitled "Effective Use of Knowledge in Developing the Post-2020 Global Biodiversity Framework" (CBD/SBI/2/INF/33), which provides options for increasing access to evidence that supports the development of a post-2020 GBF. The expert meeting, among other things:

³⁰ <https://doi.org/10.15468/6jxa-yb44>

³¹ <https://www.biodiversityinformatics.org/>

³² <https://geobon.org/>

³³ <https://www.stapgef.org/knowledge-management-gef>

³⁴ <https://marinebon.org/>

³⁵ <https://www.tdwg.org/>

³⁶ <https://www.cambridgeconservation.org/resource/framing-the-future-for-biodiversity-10-12-april-2018-meeting-documentation/>

- (a) Recognized the potential value of developing a knowledge generation or research strategy for the post-2020 global biodiversity framework, noting that such a strategy would facilitate the identification of knowledge needed to support implementation of the the post-2020 GBF.
- (b) Highlighted the need to consider evidence from different knowledge systems, and in particular traditional knowledge systems, and that such evidence must be included in any knowledge generation or research strategy if it is to be effective.
- (c) Noted that significant data, information and knowledge is available, but it is often not readily accessible to those who could use it to good effect.

8. Effort has already been made to encourage knowledge generation and collection through various processes, and as such, a potential gap remains in the discovery of and facilitation and use of information and knowledge about biodiversity for the implementation of the Convention on Biological Diversity, its Protocols and other biodiversity-related Conventions. In the annex to decision CBD/COP/XIII/31, voluntary guidance to improve the accessibility of biodiversity-related data is given and can be a model for additional guidance to be developed.
