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INDICATORS FOR GLOBAL AND NATIONAL BIODIVERSITY TARGETS – EXPERIENCE AND INDICATOR RESOURCES FOR DEVELOPMENT OF THE POST- 2020 GLOBAL BIODIVERSITY FRAMEWORK

Note by the Executive Secretary

1. In decision [14/34](#), the Conference of the Parties requested the Subsidiary Body on Scientific, Technical and Technological Advice at its twenty-third and twenty-fourth meetings to contribute to the development of the post-2020 global biodiversity framework and in support of the work of the open-ended intersessional working group (para. 16). Further, the preparatory process for the development of the post-2020 global biodiversity framework adopted by decision 14/34 requires that the process be knowledge-based and that it includes provision for analytical work prepared in accordance with recommendation SBSTTA-XXI/1 and decision [14/35](#).
2. The Open-ended Working Group on the Post-2020 Global Biodiversity Framework, at its first meeting in August 2019, invited the Subsidiary Body on Scientific, Technical and Technological Advice, with reference to the findings of the global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), to provide elements concerning guidance on specific goals, SMART targets, indicators, baselines, and monitoring frameworks, relating to the drivers of biodiversity loss, for achieving transformational change, within the scope of the three objectives of the Convention.¹
3. The Executive Secretary circulates herewith, for the information of participants in the twenty-third meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, an information document on the experience and indicators resources available for the development of the post-2020 global biodiversity framework prepared by the United Nations Environment Programme's World Conservation Monitoring Center (UNEP-WCMC) and the NatureServe Biodiversity indicators Program at the request of the Secretariat of the Convention on Biological Diversity in response to the requests above. UNEP-WCMC is the secretariat of the Biodiversity Indicators Partnership. The document is presented in the form and language in which it was received by the Secretariat.

* [CBD/SBSTTA/23/1](#).

¹ CBD/WG2020/1/5. See paragraph 7 of the conclusions.

Indicators for global and national biodiversity targets – experience and resources for development of the post-2020 global biodiversity framework

Information Document for SBSTTA-23

Purpose and Structure of this document

The intention of this document is to support considerations on the use and selection of indicators for the post-2020 global biodiversity framework at SBSTTA-23, the Open-Ended Working Group for the post-2020 Global Biodiversity Framework (OEWG) and the Subsidiary Body on Implementation (SBI). It first provides an overview of the uses, development and availability of indicators for the Strategic Plan for Biodiversity 2011-2020, including for IPBES and the SDGs. From this review, some conclusions and questions are offered to assist discussions on indicators for the new framework. As resources for these discussions, a list of available indicators relevant to the Aichi Biodiversity Targets is provided, with a summary of the number of indicators for each Target, and the criteria for inclusion of indicators in the Biodiversity Indicators Partnership.

The information provided in this document will be updated and tailored to specific thematic areas of future targets based on discussions and progress in the development of the post2020 global biodiversity framework towards CBD CoP15 in Kunming.

The document is guided by a recognition that:

- The selection and development of indicators is easier when there is a clear purpose or use for the indicator, such as monitoring progress to a target;
- “The post-2020 global biodiversity framework is global in nature. However, consideration should be given to developing global targets which can be disaggregated or otherwise adapted to the regional, national or subnational scales, and be actionable at those scales.”² Equally, the development of indicators for these targets should consider their use and feasibility at multiple scales, and particularly in the context of any strengthened accountability mechanism(s) that might be considered for the implementation of the framework;
- The status of a list of indicators for the new framework will significantly affect how the indicators are developed and used;
- The production of an indicator over time requires a responsible institution and funding for the design of the indicator, data collection and analysis, and communication of the results.

² CBD/SBSTTA/23/2/Add.4

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This document has been produced by the UN Environment Programme World Conservation Monitoring Centre ([UNEP-WCMC](#)) and the NatureServe Biodiversity indicators Program.

The document builds on the results of a workshop convened at the University of Cambridge, UK, from 20-24 May 2019, entitled ‘Gaining Consensus on spatial and temporal biodiversity metrics for informed decision-making³’. The workshop brought together over 100 scientists, and was a collaborative effort between the [Luc Hoffmann Institute](#), UNEP-WCMC, [National Geographic Society](#), the [NatureMap consortium](#), and the biodiversity hub of the [Science-Based Targets Network](#).

³ www.unep-wcmc.org/resources-and-data/workshop-report-a-synthesis-of-available-scientific-input-to-inform-the-development-of-the-post-2020-global-biodiversity-framework

A) Overview and key messages on the uses and development of indicators for the Strategic Plan for Biodiversity 2011-2020

Use of global indicators in support of the Strategic Plan for Biodiversity 2011-2020

Key message: A suite of global indicators are available and used in assessments of progress towards the Aichi Biodiversity Targets, but are supplemented by other sources where indicators are lacking.

The first use of global indicators for measuring progress towards the Aichi Biodiversity Targets was an analysis by Tittensor *et al.* (2014), based on 55 indicators with data sets suitable for projecting trends to 2020. Results were not presented for individual Aichi Biodiversity Targets, but indicators were assigned into state, pressures, benefits, or responses categories. This study formed a major input to the Technical Report which provided the scientific underpinning for Global Biodiversity Outlook 4 (Leadley *et al.* 2014). The Technical Report presented information on the status and trends of available indicators for each Aichi Target.

In 2019 the IPBES Global Assessment on Biodiversity and Ecosystem Services included an assessment of progress globally towards the Aichi Biodiversity Targets⁴. This expanded the analysis of Tittensor *et al.* (2014), with updated time series and the use of 68 indicators selected from more than 160 potential indicators. Progress towards each element of the Aichi Biodiversity Targets was scored as good, moderate, poor or unknown, based on quantitative analysis of indicators, a systematic review of the literature, fifth national reports to the CBD, and available information on countries' stated intentions to implement additional actions by 2020. For this scoring a greater weight was given to indicators with high alignment, greater geographic coverage, and longer time series.

In the IPBES Assessment, for 19 (35%) of the 54 elements of the Aichi Biodiversity Targets there were no indicators with data suitable for extrapolation, and for Targets 15 and 18 no suitable global indicators were available for any of their elements. This situation is partly a reflection of the fact that most of the indicators were not originally designed for reporting on Aichi Biodiversity Targets, but mainly a reflection of the lack of measurability of many of the Aichi Target elements. Section 3.8 of the IPBES Global Assessment identifies knowledge gaps for measuring progress to the Targets.

The fifth edition of the Global Biodiversity Outlook will be published in 2020. This will include an assessment of progress towards the Aichi Biodiversity Targets based on a range of indicators drawn together by the Biodiversity Indicators Partnership, research studies and assessments (in particular the IPBES Global Assessment on Biodiversity and Ecosystem Services), as well as the sixth national reports on implementation of the CBD.

Uses of national indicators in support of the Strategic Plan for Biodiversity 2011-2020

Key message: Whilst many national level indicators are used across various elements of the Aichi Biodiversity Targets, most countries do not have sufficient data on the status of biodiversity to develop indicators for national biodiversity target outcomes. A key challenge is the lack of national institutions with responsibility for the collection, analysis and communication of data and information on biodiversity. Nevertheless, countries historically have tended to use nationally derived indicators more than global ones in their reports, suggesting that national inputs to adoption of future targets and indicators will be key.

In 2016 the Secretariat of the CBD produced a report, 'National Indicators and Approaches to Monitor Progress towards the Aichi Biodiversity Targets'⁵. This brought together the outcomes of an

⁴ https://www.ipbes.net/system/tdf/ipbes_global_assessment_chapter_3_unedited_31may.pdf?file=1&type=node&iid=35279

⁵ [UNEP/CBD/SBSTTA/20/INF/34](https://www.unep.org/cbd/sites/default/files/2016-12/UNEP-CBD-SBSTTA-20-INF-34.pdf)

Ad Hoc Technical Expert Group (AHTEG) on Indicators in 2015 and information in 156 fifth national reports to the CBD. Its general observations included:

‘While most Parties make use of at least a few indicators in their national reports, how they are used is highly variable. The indicators in the national reports tend to be a mixture of both outcome or impact indicators (those that measure a change in the status of biodiversity) and process indicators (those that measure actions taken). Some reports have referred to and made use of comprehensive sets of indicators, however most have used them in a less systematic way. Further even those reports that have made extensive use of indicators, often have gaps where certain targets or elements of targets do not have indicators.

Many of the indicators used in the fifth national reports are not necessarily specific to biodiversity or solely related to monitoring the implementation of the Strategic Plan for Biodiversity 2011-2020.

Indicators are most often used for targets 5, 11, and 12 while relatively few Parties have used indicators to assess progress towards targets 2, 3, 13, 16, 17, 18 and 19.’

As noted in the Addendum document CBD/SBSTTA/23/2/Add.4⁶, ‘Observations on Potential Elements for the post-2020 Global Biodiversity Framework’, the available evidence from national reports to the CBD and other sources suggests that the use of global indicators by Parties at the national level for monitoring of progress towards national targets - even in instances where the methodology for the indicator allows it to be used and national level and national level data are available - has been limited. Tools such as the BIP Dashboard⁷ and the UN Biodiversity Lab⁸ are increasing the availability of global indicator results and spatial data for use by countries, and there is evidence of their increased use in sixth national reports to the CBD.

Beyond the available global indicators there are also many additional and different indicators in use at national level, which whilst providing valuable information on progress towards diverse national targets, complicates their compilation in the overall assessment of progress towards the global Aichi Biodiversity Targets.

Countries with a national agency or equivalent with the mandate and capacity to produce and/or compile biodiversity data have stronger capacity to provide robust indicators of progress towards national and global biodiversity targets than those that lack such institutions.

A recent assessment of indicator use in fifth national reports to the CBD found that national indicators were used 11 times as frequently as global indicators (Bhatt et al. 2019). Of the indicators used in the reports, just 22% matched generic and 11% matched specific indicators recommended by the AHTEG. Most indicators, whether national or global, addressed Strategic Goals B (reduce direct pressures on biodiversity; Aichi Targets 5-10) and C (improve biodiversity status; Aichi Targets 11-13). National income level was not a predictor of overall indicator use, global or national scale of indicators used, or adoption of AHTEG-recommended indicators. Although reasons why countries choose national over global indicators may vary (discussed in Han et al. 2016), these findings suggest that the next generation of targets be established in close consultation with both government policy representatives and technical indicator experts to ensure (1) that targets are measurable and scalable across countries, (2) each target has fit-for-purpose indicators identified at the outset, and (3) that governments are willing and able to use these agreed-upon indicators. Such a process will increase the transparency, efficiency and integrity of the reporting process, provide a clearer

⁶ www.cbd.int/meetings/SBSTTA-23

⁷ <https://bipdashboard.natureserve.org/bip>

⁸ www.unbiodiversitylab.org/

warning when targets are not being met, and facilitate directed conservation interventions where needed.

Status and selection of global indicators for the Strategic Plan for Biodiversity 2011-2020

Key messages: The status of global indicators for the Strategic Plan for Biodiversity 2011-2020 is that of a “flexible framework and indicative list”. This has enabled global assessments of progress towards the Aichi Biodiversity Targets to select indicators on the basis of their suitability and available data at the time of reporting, but also for the global list to be used as guidance for national level application.

The selection process for this indicative list has involved support from two CBD expert meetings and the Biodiversity Indicators Partnership.

To help monitor progress towards achieving the Aichi Biodiversity Targets, the CBD adopted a first list of indicators in decision XI/3 in 2012⁹. This list was compiled by a CBD Ad-Hoc Technical Expert Group (AHTEG) on Indicators¹⁰, with the support of UNEP-WCMC. The indicators were categorised as:

- ready for use at the global level
- could be used at the global level but which require further development to be ready for use
- additional indicators for consideration for use at the national or other sub-global level

CBD COP Decision XI/3 defined these indicators as a “flexible framework and indicative list of indicators”. Their status could be considered as recommended for use, so they are not obligatory nor a constraint on the choice of indicators for use at global or national levels. This first list was used as an input to the selection of indicators used by Tittensor *et al.* (2014) and the Technical Report for Global Biodiversity Outlook 4 (Leadley *et al.* 2014).

The ‘flexible framework’ list of indicators for the Strategic Plan for Biodiversity 2011-2020 was revised and expanded in the CBD COP decision XIII/28¹¹ in 2016, based on the recommendations of the 2015 AHTEG on indicators¹². This list distinguished generic indicators that identify types of issues that could be monitored, and specific indicators for those operational indicators that can be used to monitor changing trends in these issues. Of the 146 indicators on the list, 82 were classified as available, 34 were under active development and 30 indicators were simply suggestions for development.

Since 2007 the Biodiversity Indicators Partnership (BIP) has supported the availability and use of biodiversity-related indicators for the CBD and other biodiversity-related Conventions, for IPBES, for the Sustainable Development Goals, and for national governments and regional entities. The scope of BIP includes over 70 indicators and over 60 organizations producing, using or otherwise supporting biodiversity indicators. BIP provides detailed information on these indicators, along with resources on developing indicators for national use. The results of many of the indicators of BIP members are visualised and accessible for global and national use on the BIP Dashboard. The BIP has facilitated the provision of data from its partners for indicators used in fourth and fifth editions of GBO, and the IPBES Global Assessment on Biodiversity and Ecosystem Services.

⁹ CBD (2012) Monitoring progress in implementation of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. Decision XI/3. www.cbd.int/decision/cop/default.shtml?id=13164.

¹⁰ www.cbd.int/meetings/AHTEG-SP-IND-01

¹¹ www.cbd.int/decisions/cop/?m=cop-13

¹² www.cbd.int/meetings/ID-AHTEG-2015-01

B) Availability of indicators for the Aichi Biodiversity Targets and the post-2020 global biodiversity framework

Key message: There are still major gaps in the availability of suitable indicators with global data for many of the Aichi Biodiversity Targets. This is in part because most of the available indicators were originally developed for purposes other than reporting on the Aichi Biodiversity Targets. For some of the gaps this may be due to an absence of institutions promoting global action and measurement of the target subjects. Some of the Aichi Targets are also difficult to measure at the global scale, providing lessons learned for the development of future global targets.

To assist the consideration of possible indicators for the post-2020 global biodiversity framework UNEP-WCMC has compiled an Excel database of 100 indicators of relevance to the themes of the Aichi Biodiversity Targets and which are currently available for use at the global scale. Summary information on these indicators and their suitability for the themes of the Aichi Biodiversity Targets is provided in Annex 1 and listed in Annex 2. The indicators are assessed for the following characteristics:

- Alignment to the Target
- Geographic coverage
- Data time series
- Suitable for national use
- Data available for national use

This database is available on request from Hilary.Allison@unep-wcmc.org and will be updated with potential relevant indicators as wording for targets is elaborated in the draft post-2020 global biodiversity framework text.

The principle source of indicators in the database is the list of indicators for the Strategic Plan for Biodiversity 2011-2020 in CBD COP Decision XIII/28¹³. This list was supplemented with any additional indicators in the BIP and the IPBES core list of indicators, and with information on indicators and relevant datasets from the May 2019 workshop ‘Gaining Consensus on spatial and temporal biodiversity metrics for informed decision-making’¹⁴. Only indicators which are currently available for use are included, although in some cases they may not have recent data points or plans for continuation.

The database includes no global indicators for Aichi Biodiversity Target 2 and only a single indicator for Targets 16, 17, 18 and 20. Other Targets with few available indicators are 1, 15, and 19, with 2 or 3 indicators. Target 4 has of 12 available indicators, the highest number, and Target 11 has 10 indicators, and Targets 8 and 13 have 8 indicators.

C) Potential for the development of new indicators

Key message: It is possible to develop new indicators to fill gaps, but this requires investment and ‘champion’ institutions. ‘Big data’ is increasing the potential for new indicators.

¹³ <https://www.cbd.int/decisions/cop/?m=cop-13>

¹⁴ www.unep-wcmc.org/resources-and-data/workshop-report-a-synthesis-of-available-scientific-input-to-inform-the-development-of-the-post-2020-global-biodiversity-framework

Whilst there are significant gaps in the availability of global indicators for the Aichi Targets (and it is likely that a similar challenge will be faced within the new post 2020 framework depending on the measurability of future targets) it has been demonstrated that additional indicators can be found, adapted or developed to fill such gaps. From 2015 to 2018, the Mind the Gap project led by UNEP-WCMC with substantial input from BIP Partners and with financial support from the European Union and UNEP, added over 30 new indicators to the BIP. Some of these indicators were adapted from existing indicators and data to meet new specific needs. Other indicators already existed but had not been recognised by their providers as relevant to the Aichi Biodiversity Targets. Three new indicators were developed specifically for Aichi Targets 1, 13 and 15 in response to a call for proposals. Two of these indicators drew on the increasing availability of remote sensing data and ‘big data’ from online sources. As with many indicators, there remains a challenge to sustain resources for their long-term production.

There is also increasing availability of spatial and other datasets and analyses to assist countries and other stakeholders in monitoring implementation of the post-2020 global biodiversity framework, as identified in the workshop ‘Gaining Consensus on spatial and temporal biodiversity metrics for informed decision-making’¹⁵.

D) Additional considerations for identifying indicators for the post-2020 global biodiversity framework

The following questions and considerations are intended to assist discussion on the selection and development of indicators for the post-2020 global biodiversity framework. The BIP has also produced a flyer with twelve lessons on indicator development and use for the framework, some of which are incorporated in this document.¹⁶

How will global indicators be used for the post-2020 global biodiversity framework?

The identification and development of indicators is greatly facilitated when there is a clarity of the purpose and use of the indicators. This can be provided through determining the global policy and reporting processes and audiences linked to the post-2020 global biodiversity framework that will make use of the global indicators

For example, the indicators might be used every five/six years in a Global Biodiversity Outlook report or its equivalent. There might also be more frequent global and national assessments and reviews of implementation of the framework that would require more sensitive and frequent time series data to be available. Making indicator information available online and updated as new data are produced for example through the concept of a ‘TargetTracker’ website with a dashboard of indicator results in relation to targets would also help with transparency of implementation.

The extent to which there is alignment between indicators for the post-2020 global biodiversity framework and the indicators used for assessment of progress towards biodiversity-related targets in the Sustainable Development Goals (SDGs) might also be considered. The opportunity to strengthen the use of a common set of indicators for national level reporting would greatly facilitate a bottom-up approach to monitoring progress towards the global targets in the future framework and contribute to a possible elements of an accountability framework for the post2020 global biodiversity framework .

¹⁵ www.unep-wcmc.org/resources-and-data/workshop-report-a-synthesis-of-available-scientific-input-to-inform-the-development-of-the-post-2020-global-biodiversity-framework

¹⁶ www.bipindicators.net/system/comfy/cms/files/files/000/000/184/original/3182_Lessons_Learnt_2pp_A4.pdf

What will be the status of the indicators in the post-2020 global biodiversity framework?

Section IV. Indicators, Baselines and Monitoring Frameworks of document CBD/SBSTTA/23/2/Add.4¹⁷ states that

“Indicators, the baseline and the monitoring framework will all be necessarily tied to the development of long-term goals and SMART targets.” It also states that, “Once target nomenclature and formulation have been further developed, global indicators will be tied to each of 2050 goals and the 2030 targets, taking into consideration the need for national and regional targets to scale up to global targets and vice versa.”

There are various ways in which indicators might be “tied to” targets and goals in the post-2020 global biodiversity framework. To help provide some insights into this issue, it is useful to consider the different status and selection processes of indicators for the SDGs and the Strategic Plan for Biodiversity 2011-2020.

The framework of global indicators for the SDGs and their targets is developed by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDG¹⁸). This framework is agreed upon by the UN Statistical Commission and adopted by the UN General Assembly¹⁹. These indicators are “a limited and voluntary set”, with only one or two indicators selected for each of the 169 Targets. They are promoted as official statistics and data from national statistical systems, which are to be reported to, and aggregated by, specified global agencies as the basis for global reporting.

The IAEG-SDG²⁰ classifies all the proposed and established indicators into three tiers, as follows:

Tier 1: Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant.

Tier 2: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries.

Tier 3: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested.

Table 1 presents some perspectives on the possible advantages and disadvantages of a limited set of indicators or a flexible indicator framework.

¹⁷ www.cbd.int/meetings/SBSTTA-23

¹⁸ <https://unstats.un.org/sdgs/iaeg-sdgs/>

¹⁹ <https://undocs.org/A/RES/71/313>

²⁰ <https://unstats.un.org/sdgs/iaeg-sdgs/>

Table 1. Key advantages and disadvantages of a limited set of indicators or a flexible indicator framework

<p>A limited set of global and national indicators for reporting on global targets</p>	<p>A flexible framework of ‘indicative’ global and national indicators for reporting on global targets</p>
<p>Advantages</p> <ul style="list-style-type: none"> • Continuity of the use of the same indicators across time for global and national reporting. • Clarity for countries on priority indicators to use and to invest in their compilation. • Facilitates a common understanding of progress across countries and regions and needs for additional implementation support. • Enables aggregation of national progress to regional and global scales. • May assist indicator custodian agencies to secure resources for development and production of the indicators. 	<p>Advantages</p> <ul style="list-style-type: none"> • Global and national assessment and reporting on targets can use and adapt a wide range of indicators, according to the needs and capacity of the reporting body. • Additional indicators can be developed and made available without the delay of or resources required for an official approval process.
<p>Disadvantages</p> <ul style="list-style-type: none"> • Many of the themes in the Aichi Biodiversity Targets do not have global data sets that are methodologically suitable and/or have available data for use at national level. • Additional institutional capacity may be required in many countries to gather, analyse, and communicate indicators on the status of biodiversity, pressures on biodiversity, and ecosystem services. • Parties may prefer to use nationally-developed indicators and data. • The pressure to have a limited, practical number of indicators means that any multi-faceted targets agreed under the future framework may be measured by only one or two indicators. • The understanding and communication of a complex target theme may be distorted or over-simplified by only focusing on one or two ‘official’ indicator(s). 	<p>Disadvantages</p> <ul style="list-style-type: none"> • A common understanding of progress towards national and global and identification of additional needs for implementation support is challenging. • Aggregation of national results to regional and global scales may not be possible. • Measurement of progress towards targets over time may use different indicators and therefore not be comparable. • Developing strengthened accountability for implementation of the global biodiversity framework is difficult.

How will indicators be selected for the post-2020 global biodiversity framework?

The document ‘Observations on Potential Elements for the post-2020 Global Biodiversity Framework’ includes 25 possible target topics, including all the themes addressed by the Aichi Biodiversity Targets and new topics. For the targets in the framework, existing relevant indicators will need to be identified, along with indicator gaps in the framework. A mechanism for global and national indicator users, providers and supporters to contribute to the process of deciding on

indicators for the framework might be considered, along with criteria for the selection and development of indicators.

Annex 1 includes definitions of the properties used to assess the suitability of available global indicators to assist SBSTTA and the OEWG on post-2020 global biodiversity framework. Annex 2 is a list of the indicators, and Annex 3 presents the criteria to assess proposed new indicators for inclusion in the Biodiversity Indicators Partnership.

What is the desired relationship between indicators used to track progress towards national targets and global indicators used to track progress towards future global targets?

Global targets are often translated or otherwise adapted for use as targets at the national level, which can make the use of the same indicators across scales and countries problematic.

Whilst targets in their first draft are likely to be articulated based on desired outcomes, and not constrained by the availability of indicators, there will be many opportunities to refine targets to strengthen their measurability. One aspect of the development of the post-2020 global biodiversity framework is the desired relationship between global targets and subglobal targets and actions for their achievement. If "consideration should be given to developing global targets which can be disaggregated or otherwise adapted to the regional, national or subnational scales, and be actionable at those scales"²¹, then the measurability of targets at subglobal scales needs to be considered alongside their measurability at the global scale.

If global targets are designed with the ability to disaggregate to national targets, and with corresponding indicators and reporting, then consideration will also need to be given to the necessary mechanisms and capacity for producing the indicator data at these scales. Such capacity is likely to be easier to develop where reporting on targets is primarily focused on a limited set of a few headline indicators, which may be practical at multiple scales.

The BIP website and its Dashboard of indicator visualisations provides information on the national use of global biodiversity indicators.

How might targets be developed to ensure their measurability?

The wording or phrasing of targets can significantly affect whether indicators for measuring progress can be easily identified or developed. Some observations are offered on issues for aiding the selection of progress indicators, with a few examples from the Aichi Biodiversity Targets.

Recent studies suggest that SMART (Specific, Measurable, Achievable, Relevant, Time-bound) Aichi targets were more likely to gain traction under the current Strategic Plan for Biodiversity 2011-2020^{22 23 24}. Developing indicators and indexes in parallel to the development of the framework and its targets will help to ensure that necessary indicators and spatial data at national and sub-national scales are in place at the adoption of targets. This would also inform their measurability and relative levels of ambition through the provision of baselines and distance-to-target measures.

²¹ CBD/SBSTTA/23/2/Add.4

²² Green, E. J., Buchanan, G. M., Butchart, S. H., Chandler, G. M., Burgess, N. D., Hill, S. L., & Gregory, R. D. (2019). Relating characteristics of global biodiversity targets to reported progress. *Conservation Biology*

²³ Butchart, S. H., Di Marco, M., & Watson, J. E. (2016). Formulating smart commitments on biodiversity: lessons from the Aichi Targets. *Conservation Letters*, 9(6), 457-468;

²⁴ Han X, et al (2014) A Biodiversity Indicators Dashboard: Addressing Challenges to Monitoring Progress towards the Aichi Biodiversity Targets Using Disaggregated Global Data. *PLoS ONE* 9(11)

1) Use terms that have established definitions, and be prepared to establish definitions and measurements for new concepts.

For example, for Aichi Target 11 on protected areas, there are established definitions of protected areas by the CBD²⁵ and IUCN WCPA²⁶ and indicators of protected areas coverage²⁷. The Target also includes ‘other effective area-based conservation measures’. However, in 2010 there was no established definition for this term until the adoption of a CBD COP decision 14/8 in 2018²⁸ with a definition and guidance on application of the term. Work is now underway to compile a baseline from which indicators could in the future be developed and to better inform future area-based conservation coverage targets.

2) Use terms that are unambiguous

For example, Aichi Target 5 includes, “By 2020, the rate of loss of all natural habitats, including forests, is at least halved...”, and Aichi Target 14 includes “By 2020, ecosystems that provide essential services, ..., are restored and safeguarded,...”. The terms ‘habitat’ and ‘ecosystem’ are often used to refer to the same area or concept. It is unclear whether a significant difference between the terms is intended within the framework of the Aichi Targets, and so whether they should be measured with different or the same indicators.

3) Consider if the concept in a target can be measured

For example, Aichi Target 15 includes, “By 2020, ecosystem resilience has been enhanced,”. However, the concept of ecosystem resilience is difficult to measure in practice. This is partly because it has multiple definitions and includes properties such as resistance, recovery and persistence of a system. It is also often challenging to define a geographical area as an ecosystem, and to define its properties for resilience and how these would be measured. The concept of ecosystem resilience is also difficult to apply at large scales up to the global scale.

4) Provide additional explanation and guidance on the justification for the target and the definitions of its terms.

Since some of the terms in a target may be new or ambitious, the identification of indicators to measure progress is assisted if there is supporting guidance on the background to the target and how it could be applied. For example, the ‘Quick Guides for the Aichi Biodiversity Targets’²⁹ provided by the Secretariat of the CBD.

²⁵ www.cbd.int/protected/pacbd/

²⁶ www.iucn.org/theme/protected-areas/about

²⁷ www.bipindicators.net/indicators/coverage-of-protected-areas-terrestrial-and-marine

²⁸ www.cbd.int/conferences/2018/cop-14/documents

²⁹ www.cbd.int/nbsap/training/quick-guides/

References

- Bhatt, R., Gill, M., Hamilton, H., Han, X., Linden, H., and Young, B. 2019. Uneven use of biodiversity indicators in fifth national reports to the Convention on Biological Diversity. *Environmental Conservation*, in press.
- Han, X., Josse, C., Young, B. E., Smyth, R. L., Hamilton, H. H. and Bowles-Newark, N. 2016. Monitoring national conservation progress with indicators derived from global and national datasets. *Biological Conservation* <http://dx.doi.org/10.1016/j.biocon.2016.08.023>
- Leadley, P.W., Krug, C.B., Alkemade, R., Pereira, H.M., Sumaila U.R., Walpole, M., Marques, A., Newbold, T., Teh, L.S.L, van Kolck, J., Bellard, C., Januchowski-Hartley, S.R. and Mumby, P.J. (2014): *Progress towards the Aichi Biodiversity Targets: An Assessment of Biodiversity Trends, Policy Scenarios and Key Actions*. Secretariat of the Convention on Biological Diversity, Montreal, Canada. Technical Series 78, 500 pages.
- McOwen, C. J., S. Ivory, M. J. R. Dixon, E. C. Regan, A. Obrecht, D. P. Tittensor, A. Teller, and A. M. Chenerly. (2016). Sufficiency and Suitability of Global Biodiversity Indicators for Monitoring Progress to 2020 Targets. *Conservation Letters* **9**:489-494.
- Tittensor, D.P., Walpole, M., Hill, S.L.L., Boyce, D.G., Britten, G.L., Burgess, N.D., Butchart, S.H.M., Leadley, P.W., Regan, E.C., Alkemade, R., Baumung, R., Bellard, C., Bouwman, L., Bowles-Newark, N.J., Chenerly, A.M., Cheung, W.W.L., Christensen, V., Cooper, H.D., Crowther, A.R., Dixon, M.J.R., Galli, A., Gaveau, V., Gregory, R.D., Gutierrez, N.L., Hirsch, T.L., Hoft, R., Januchowski-Hartley, S.R., Karmann, M., Krug, C.B., Leverington, F.J., Loh, J., Lojenga, R.K., Malsch, K., Marques, A., Morgan, D.H.W., Mumby, P.J., Newbold, T., Noonan-Mooney, K., Pagad, S.N., Parks, B.C., Pereira, H.M., Robertson, T., Rondinini, C., Santini, L., Scharlemann, J.P.W., Schindler, S., Sumaila, U.R., Teh, L.S.L., van Kolck, J., Visconti, P., Ye, Y., (2014). A mid-term analysis of progress toward international biodiversity targets. *Science* (80). 346, 241–244. doi:10.1126/science.1257484

Annex 1. Summary table of the numbers and suitability of available global indicators for the themes of the Aichi Targets

Aichi target	Aichi Target theme	Number of available global indicators	Alignment to Aichi Target		Data geographic coverage		Data time series		Method suitable for national use	Data available for national use
			Direct	Indirect	Global	Partial	Good	Poor		
1	Public awareness	3	3	0	2	1	1	2	3	2
2	Valuing biodiversity	0	0	0	0	0	0	0	0	0
3	Incentives	4	4	0	4	0	4	0	4	4
4	Sustainable production & consumption	12	11	1	12	0	4	8	11	11
5	Habitat loss	8	6	0	8	0	4	4	8	7
6	Sustainable fisheries	8	6	2	8	0	5	3	6	4
7	Sustainable forestry and agriculture	7	5	2	7	0	3	4	7	7
8	Pollution	8	4	4	8	0	2	6	7	7
9	Invasive alien species	4	4	0	4	0	4	0	4	4
10	Climate change	7	6	1	5	2	5	2	7	7
11	Protected areas	10	9	1	9	1	6	4	10	10
12	Threatened species	7	3	4	6	1	5	2	5	5
13	Safeguard Genetic diversity	8	5	3	8	0	2	6	7	7
14	Ecosystem services	5	2	3	5	0	4	1	5	5
15	Ecosystem restoration	2	2	0	1	1	1	1	2	2
16	Access to and benefits of genetic resources	1	1	0	1	0	1	0	1	1
17	NBSAPs	1	1	0	1	0	1	0	1	1
18	Traditional knowledge	1	0	1	1	0	0	1	1	0
19	Sharing information and knowledge	3	0	3	3	0	3	0	3	2
20	Resource mobilisation	1	1	0	1	0	1	0	1	1

The table is a summary of the properties of indicators in a database compiled by UNEP-WCMC of indicators of relevance to the themes of the Aichi Biodiversity Targets. The principle source of indicators in the database is the list of indicators for the Strategic Plan for Biodiversity 2011-2020 in decision XIII/28³⁰. Only indicators which are currently available for use are included. This list is supplemented with additional indicators in the BIP and the IPBES core list of indicators³¹. The database currently contains 100 indicators, and will be expanded with additional indicators once draft targets for the post-2020 global biodiversity framework are available. Comments and suggestions for further iterations can be sent to Natasha.Ali@unep-wcmc.org.

The indicators in the database are listed in Annex 2.

The indicators are assessed for the following properties:

Alignment to the Target:

If the indicator is a direct measurement of an element of the Aichi Biodiversity Target it is classified as having direct alignment. If an indicator is of relevance to understanding the subject of a Target element but is not a direct measure it is classified as having indirect alignment.

Geographic coverage:

If the data set for the indicator has global coverage this is identified, otherwise it is classified as partial geographic coverage.

Data time series:

If the data for the indicator has five or more data points since 2009 it is classified as good, or poor if there are one to four data points since 2009.

Suitable for national use:

An assessment is made of whether the concept and method for the indicator is suitable for use at the national scale or not.

Data available for national use:

If the global data set for the indicator includes data for use at the national scale this is identified.

³⁰ <https://www.cbd.int/decisions/cop/?m=cop-13>

³¹ <https://www.ipbes.net/core-indicators>

Annex 2. List of available global indicators for the themes of the Aichi Targets

The table is a list of the indicators in a database compiled by UNEP-WCMC of indicators of relevance to the themes of the Aichi Biodiversity Targets. The principle source of indicators in the database is the list of indicators for the Strategic Plan for Biodiversity 2011-2020 in Decision XIII/28³². Only indicators which are currently available for use are included. This list is supplemented with any additional indicators in the BIP and the IPBES core list of indicators³³.

The document ‘Observations on Potential Elements for the post-2020 Global Biodiversity Framework’ includes 25 possible target topics, with information on their links to the Aichi Biodiversity Targets. These possible target topics are included in the list in relation to their linkages with the Aichi Targets, to assist an initial consideration of the availability of global indicators for topics that link to the Aichi Targets. However, it is very important to note that **this list has not been compiled through a search for indicators currently available for use in relation to the new framework’s possible target topics as such**. For this reason there are no indicators in the list for the possible target topics of ‘Other transformational issues’, ‘Capacity building’, ‘Gender’, or ‘Biosafety’.

The database currently contains 100 indicators, and will be expanded with additional indicators once draft targets for the post-2020 global biodiversity framework are available.

Possible target topic in the post-2020 global biodiversity framework that has a link to the Aichi Target	Indicator name	Aichi Target	Responsible institution
Awareness Existence and intrinsic values of nature	Biodiversity Barometer	1	Union for Ethical Biotrade
Awareness Existence and intrinsic values of nature	Biodiversity literacy in global zoo and aquarium visitors	1	Chester Zoo, WAZA

³² <https://www.cbd.int/decisions/cop/?m=cop-13>

³³ <https://www.ipbes.net/core-indicators>

Awareness Existence and intrinsic values of nature	Global Biodiversity Engagement Indicator	1	Conservation International
Incentives Laws, regulations and policies	Number of countries with biodiversity-relevant charges and fees	3	OECD
Incentives Laws, regulations and policies	Number of countries with biodiversity-relevant taxes	3	OECD
Incentives Laws, regulations and policies	Number of countries with biodiversity-relevant tradable permit schemes	3	OECD
Incentives Laws, regulations and policies	Trends in potentially environmentally harmful elements of government support to agriculture (producer support estimate)	3	OECD
Sustainable production and consumption	Change in water use efficiency over time	4	FAO
Sustainable production and consumption	Ecological Footprint	4	Global Footprint Network
Sustainable production and consumption	Human appropriation of fresh water (water footprint)	4	Water Footprint Network
Sustainable production and consumption	Human Appropriation of Net Primary Production (HANPP)	4	Institute of Social Ecology, University of Natural Resources and Life Sciences, Vienna
Sustainable production and consumption	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	4	FAO
Sustainable production and consumption	Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or target into national policies	4	UNEP

Laws, regulations and policies			
Sustainable production and consumption Laws, regulations and policies	Percentage of Parties with legislation in Category 1 under CITES NLP	4	CITES
Sustainable production and consumption	Proportion of traded wildlife that was poached or illicitly trafficked	4	UNODC
Sustainable production and consumption	Red List Index (impacts of utilisation)	4	IUCN
Sustainable production and consumption	Red List Index (internationally traded species)	4	
Sustainable production and consumption	Change in water use efficiency over time (SDG Indicator 6.4.1)	4	FAO
Sustainable production and consumption	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (SDG Indicator 6.4.2)	4	FAO
Habitats Land-use change	Biodiversity Habitat Index	5	CSIRO
Habitats Land-use change	Continuous Global Mangrove Forest Cover for the 21st Century	5	Salisbury University
Habitats Land-use change	Forest area as a proportion of total land area	5	FAO
Habitats Land-use change	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	5	UNEP-WCMC
Habitats Land-use change	Species Habitat Index	5	Yale University: Environmental

			Performance Index
Habitats Land-use change	Wetland Extent Trends Index	5	Ramsar Convention
Habitats Land-use change	Proportion of land that is degraded over total land area	5	UNCCD
Habitats Land-use change	Red List Index (forest specialist species)	5	IUCN
Overexploitation	Inland fishery production	6	FAO
Overexploitation	Living Planet Index (trends in target and bycatch species)	6	ZSL
Overexploitation	Marine Trophic Index	6	Sea Around Us
Overexploitation	MSC Certified Catch	6	Marine Stewardship Council
Overexploitation Laws, regulations and policies	Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	6	FAO
Overexploitation	Proportion of fish stocks within biologically sustainable levels	6	FAO
Overexploitation	Red List Index (impacts of fisheries)	6	IUCN
Overexploitation Laws, regulations and policies	Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing (SDG Indicator 14.6.1)	6	FAO
Overexploitation	Area of forest under sustainable management: total FSC and PEFC forest management certification	7	FSC, PEFC
Overexploitation	Areas of agricultural land under conservation agriculture	7	FAO
Overexploitation	Proportion of agricultural area under productive and sustainable agriculture	7	FAO
Overexploitation	Wild Bird Index (forest & farmland specialist birds)	7	RSPB
Overexploitation	Proportion of agricultural area under productive and sustainable agriculture (SDG Indicator 2.4.1)	7	FAO

Overexploitation	Trends in forest extent (tree cover)	7	Hansen et al., 2013
Overexploitation	Living Planet Index (farmland specialists)	7	ZSL
Pollution	Index of Coastal Eutrophication (ICEP) and Floating Plastic debris Density	8	UN Environment
Pollution	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe WASH services)	8	WHO
Pollution	Nitrogen + Phosphate Fertilizers (N+P2O5 total nutrients)	8	FAO
Pollution	Nitrogen Use Efficiency	8	EPI component - Yale University
Pollution	Proportion of bodies of water with good ambient water quality	8	UN Environment
Pollution	Red List Index (impacts of pollution)	8	IUCN
Pollution	Trends in Loss of Reactive Nitrogen to the Environment	8	International Nitrogen Initiative, Nitrogen Footprint
Pollution	Trends in Nitrogen Deposition	8	International Nitrogen Initiative
Overexploitation Laws, regulations and policies	Legislation for prevention and control of invasive alien species (IAS), encompassing “Trends in policy responses, legislation and management plans to control and prevent spread of invasive alien species” and “Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species”	9	IUCN
Invasive alien species	Red List Index (impacts of invasive alien species)	9	IUCN
Invasive alien species	Trends in invasive alien species vertebrate eradications	9	IUCN
Invasive alien species	Trends in the numbers of invasive alien species introduction events	9	IUCN
Climate change	Average marine acidity (pH) measured at agreed suite of representative sampling stations	10	Intergovernmental Oceanographic Commission (IOC) of

			UNESCO
Climate change	Climatic impacts on European and North American birds	10	RSPB
Climate change	Red List Index (reef-building corals)	10	IUCN
Climate change	Reef Fish Thermal Index	10	Reef Life Survey; Integrated Marine Observing System
Climate change	Cumulative human impacts on marine ecosystems	10	National Centre for Ecological Analysis and Synthesis
Climate change	Large Reef Fish	10	Reef Life Survey; Integrated Marine Observing System
Climate change	Live coral cover	10	Global Coral Reef Monitoring Network; Global Ocean Observing System
Habitats Land-use change	Coverage of protected areas in relation to marine areas	11	UNEP-WCMC, IUCN and BirdLife International
Habitats Land-use change	Protected Area Connectedness Index (PARC-Connectedness)	11	CSIRO
Habitats Land-use change	Protected area coverage	11	UNEP-WCMC
Habitats Land-use change	Protected area coverage of ecoregions	11	UNEP-WCMC
Habitats Land-use change	Protected Area Coverage of Key Biodiversity Areas	11	BirdLife
Habitats Land-use change	Protected Area Representativeness Index (PARC-Representativeness)	11	CSIRO
Habitats Land-use change	Protected Areas Management Effectiveness	11	UNEP-WCMC

Habitats Land-use change	Species Protection Index	11	GEO BON - Map of Life
Habitats Land-use change	Wildlife Picture Index in tropical forest protected areas	11	Tropical Ecology Assessment and Monitoring Unit
Habitats Land-use change	Protected Connected (ProtConn)	11	European commission
Species	Biodiversity Intactness Index	12	Natural History Museum London
Species	Living Planet Index	12	ZSL
Species	Number of species extinctions (birds and mammals)	12	IUCN
Species	Red List Index	12	IUCN
Species	Wildlife Picture Index	12	Tropical Ecology Assessment and Monitoring Network
Species	Living Planet Index (forest specialists)	12	ZSL
Species	Number of extinctions prevented	12	IUCN
Species	Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction	13	FAO
Species	Number of animal genetic resources for food and agriculture secured in medium or long term conservation facilities (SDG Indicator 2.5.1b)	13	FAO
Species	Number of Contracting Parties to the International Treaty on Plant Genetic Resources for Food and Agriculture	13	International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
Species	Number of countries that have reported legislative, administrative and policy frameworks or measures to implement the International Treaty on Plant Genetic Resources for Food and Agriculture.	13	International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
Species	Number of plant genetic resources for food and agriculture secured in medium or long term conservation facilities (SDG Indicator 2.5.1a)	13	FAO
Species	Total number of transfers of crop material from the Multilateral System of the	13	International Treaty on

	International Treaty on Plant Genetic Resources for Food and Agriculture received in a country		Plant Genetic Resources for Food and Agriculture (ITPGRFA)
Species	Red List Index (wild relatives of domesticated animals)	13	IUCN
Species	Comprehensiveness of conservation of socioeconomically as well as culturally valuable species	13	CIAT, Crop Trust
Material goods from nature Regulating services of nature Non-material (cultural) services of nature Gender	Coverage by protected areas of important sites for mountain biodiversity	14	UNEP-WCMC
Material goods from nature Regulating services of nature Non-material (cultural) services of nature Gender	Ocean Health Index	14	National Centre for Ecological Analysis and Synthesis
Material goods from nature Regulating services of nature Non-material (cultural) services of nature Gender	Percentage of population using safely managed drinking water services	14	WHO/UNICEF
Material goods from nature Regulating services of nature Non-material	Red List Index (pollinator species)	14	IUCN

(cultural) services of nature Gender			
Material goods from nature Regulating services of nature Non-material (cultural) services of nature Gender	Red List Index (species used for food and medicine)	14	IUCN
Habitats Land-use change Climate change	Global Ecosystem Restoration Index	15	GEO BON - iDiv
Habitats Land-use change Climate change	Bioclimatic Ecosystem Resilience Index (BERI)	15	CSIRO
Equitable sharing of benefits from the use of genetic resources	Number of Parties to the Convention on Biological Diversity (CBD) that have deposited the instrument of ratification, acceptance, approval or accession of the Nagoya Protocol	16	CBD
National planning processes	Number of countries with developed or revised NBSAPs	17	CBD
Traditional knowledge	Index of Linguistic Diversity	18	Terralingua
Knowledge and technology	Growth in Species Occurrence Records Accessible Through GBIF	19	GBIF
Knowledge and technology	Proportion of known species assessed through the IUCN Red List	19	IUCN
Knowledge and technology	Species Status Information Index	19	GEO BON - Map of Life
Resource	Official development assistance for biodiversity	20	OECD

mobilisation			
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Annex 3. Criteria for the inclusion of indicators in the Biodiversity Indicators Partnership (BIP)

Policy Relevant

Essential: Indicator(s) relevant to one or more of the Aichi Biodiversity Targets.

Desired:

- Indicator features in the indicative list of indicators for the Strategic Plan for Biodiversity 2011-2020
- Indicator(s) relevant to the Targets of other biodiversity-related MEAs and processes, including the SDGs.
- An empirical analysis showing that the indicator is valuable to measure the target/phenomena has been undertaken and results documented.
- There is evidence that this indicator is already being used for decision-making.

Temporal data production and sustainability

Essential: Realistic plans in place to continue indicator production and produce regular updates – not an isolated one-off study.

Desired:

- Indicator data updated annually.
- Funds for indicator development and data collection included in regular programme resources of the organization.
- Comparable data collection and indicator calculation method used over repeated monitoring cycles.

Aggregation and flexibility

Essential: Indicator applicable at the global or regional scale.

Desired:

- Indicator aggregated from national level data or can be disaggregated to the national level.
- If relevant, indicator(s) can be disaggregated further by relevant subnational groupings or other relevant variables.

Coverage

Desired: Indicator already available at the country-level in a significant number of countries or national coverage can easily be expanded

Scientifically sound

Essential: Indicator(s) must be based on clearly defined, verifiable and scientifically acceptable data, which are collected using standard methods and definitions with known accuracy and precision, or based on traditional knowledge that has been validated in an appropriate way. All underlying data sources must be used in compliance with any associated terms of use, with clear acknowledgements of the source.

Desired: Peer reviewed in scientific literature or accepted by an intergovernmental body, such as the Inter-Agency Expert Group for the Sustainable Development Goals (IAEG-SDGs).

Complementarity

Essential: Indicator complements existing indicators in the BIP suite. Indicator provider will work with providers of relevant existing indicators to develop joint storylines.

Desired: Indicators fill demonstrable 'gaps' in the existing suite.

Sensitivity

Essential: Indicators should be sensitive to show trends and detect changes in systems in time frames and on the scales that are relevant to the decisions, but also be robust so that measuring errors do not affect the interpretation.