

Framing the Future for Biodiversity:
*Effective use of knowledge in developing the post-2020 global
biodiversity agenda*

*Cambridge, UK
10-12 April 2018
Hosted by the Cambridge Conservation Initiative*

Meeting Documentation



The Cambridge Conservation Initiative

The Cambridge Conservation Initiative (CCI) is a unique collaboration between the University of Cambridge and leading internationally-focused biodiversity conservation organisations clustered in and around Cambridge in the United Kingdom. CCI seeks to transform the global understanding and conservation of biodiversity and the natural capital it represents and, through this, secure a sustainable future for all life on Earth. The CCI partners together combine and integrate research, education, policy and practice to create innovative solutions for society and to foster conservation learning and leadership. Cambridge, UK is the hub of the largest cluster of conservation organisations in the world. Now, nearly ten years after it was founded, CCI has moved to its new location in the David Attenborough Building in the heart of Cambridge, where leaders in academia, business, government and non-governmental organisations can interact and work together.

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Meeting Summary

It is anticipated that in 2020 governments will adopt a new global biodiversity framework to succeed the *Strategic Plan for Biodiversity 2011-2020* and its *Aichi Biodiversity Targets* adopted by governments in 2010. Although the process for developing this framework has yet to be agreed, signs are that it will be developed through a broad consultative process amongst governments and other stakeholders, and that the resulting strategy – whatever form it takes – will be widely recognised by intergovernmental processes and stakeholders across a range of sectors.

The Problem: According to current trajectories, the *Aichi Biodiversity Targets* will not be met in full. In considering a post-2020 global biodiversity framework it will be important to explore why this is so, and take steps to learn lessons from previous experience. One major area of concern has been the extent to which data, information and knowledge have been effectively used in developing targets and identifying strategies for addressing them. In particular, concern has been expressed that previous targets have been set without taking full account of the available evidence base, either in terms of real understanding of what is needed in order to meet the overall goal, or the understanding of effectiveness of different policy and intervention options and their interactions.

The solution: To address these concerns, the Cambridge Conservation Initiative has convened this expert meeting to advance recognition of the importance of a comprehensive and accessible evidence base for underpinning development of the post-2020 global biodiversity framework. Outputs from the meeting will be introduced to governments and other stakeholders at CBD-related meetings in 2018, as governments debate and decide on the process for negotiating a post-2020 global biodiversity framework. The results will include an *expert report* for these meetings in the form of an ‘information document’, and associated *communication materials* which will identify for each of the following the evidence base that is needed, the types of evidence that currently exist, and where there are gaps in either the evidence or the mechanisms for delivering it:

- pathways that will lead us to (or away from) the 2050 Vision already agreed by Governments
- scale and possible mixes of policies that are going to get us on these pathways
- policy instruments and tools that will be most effective in delivering these policies
- the framework (targets) that would motivate such policies and interventions being put in place
- monitoring, indicators and reporting that would promote implementation and accountability

The outcome: It is intended that the report and associated communication will lead to improved recognition of the importance of evidence and the processes for delivering it in appropriate ways. Amongst other things, such a report would lead to consideration of these of issues in a more coherent and holistic manner:

- how target setting can be better informed by science, including what new inputs are needed
- how the findings of assessments inform strategy development and implementation
- how evidence on the effectiveness of different interventions is essential
- why it is critical to prepare for future monitoring of progress while developing targets
- whether we can clarify what levels of knowledge are “essential”, “desirable”, and “nice to have”
- what processes need to be put in place to ensure timely availability of evidence
- where there are critical gaps in evidence and/or its availability that should be addressed

Annotated draft agenda and organization of work

Tuesday 10 April	
12:00-13:00	Registration, lunch and meeting other participants
13:00-14:00	<p>Introductory session in plenary</p> <ul style="list-style-type: none"> • Welcome on behalf of CCI members (<i>Mike Rands, CCI</i>) • Welcome by workshop chair (<i>Spencer Thomas, Grenada</i>) • CBD preparation for the post-2020 agenda (<i>Alexander Shestakov, CBD Secretariat</i>) • Evidence needed for developing the post-2020 agenda (<i>Andrew Stott, Defra</i>) • Introduction to expert meeting inputs and outputs (<i>Jerry Harrison, UNEP-WCMC</i>) • Introduction to the tasks for breakout groups
14:00-15:00	<p>Breakout groups to consider whether we have a complete list of types of evidence needed</p> <p>Using the list of 16 ‘evidence types’ on page 11 each breakout group will address the following questions:</p> <ol style="list-style-type: none"> 1. <i>Do we have a complete list of the types of evidence needed?</i> 2. <i>Are other types of necessary evidence missing from the list?</i> 3. <i>If so what are they and why are they important?</i> <p>It is proposed that we will have five breakout groups, each of which would work on the same task of reviewing the list of types of evidence needed. Co-leaders will be identified for each breakout group, which will identify its own rapporteur.</p> <p><i>Throughout the meeting co-leaders will be identified in advance for each breakout group, and participants will be allocated to groups. It is expected that each group will identify its own rapporteur. There will be someone from the meeting secretariat in each group, who is there to keep a record of discussions. They are <u>not</u> expected to report back on behalf of the group.</i></p>
15:00-16:00	<p>Plenary</p> <ul style="list-style-type: none"> • Report back from breakout groups • Questions and discussion of any key issues arising and how they might be addressed • Introductory presentation on evidence types 1-4 (<i>Neville Ash, UNEP-WCMC</i>) • Introduction to the tasks for breakout groups
16:00-16:30	Coffee break
16:30-18:00	<p>Breakout groups to consider evidence types 1-4 (evidence to support understanding of pathways for achieving the vision)</p> <p>Each breakout group will address the following questions for one or more evidence types (there is a discussion note provided for each evidence type):</p> <ol style="list-style-type: none"> 1. <i>Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?</i> 2. <i>Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?</i> 3. <i>What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?</i> <p>It is proposed that we will have five breakout groups, each of which will be allocated one of the evidence streams – <i>scenarios</i> (page 13), <i>assessments</i> (page 16), <i>‘big ideas’ in science</i> (page 18), and <i>lessons from transformational change</i> (page 22). Each breakout group will also be able to move onto a second topic if they feel they have completed the first.</p>
19:00	<p>Dinner at Sidney Sussex College</p> <p><i>(the address with a map of the College can be found in the logistics information document)</i></p>

Wednesday 11 April

9:00-10:30	Plenary <ul style="list-style-type: none"> Report back from breakout groups Questions and discussion on any key issues arising Introductory presentation on evidence types 5-7 (<i>Vin Fleming, JNCC</i>) Introductory presentation on evidence types 10-13 (<i>Melanie Heath, BirdLife International</i>) Introduction to the tasks for breakout groups
10:30-11:00	Coffee break
11:00-13:00	<div> <div> Breakout groups to consider evidence types 5-7 (evidence to support identification of the scale and possible mixes of policies) <p>Each breakout group will address the following questions for one or more evidence types (there is a discussion note provided for each evidence type):</p> <ol style="list-style-type: none"> <i>Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?</i> <i>Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?</i> <i>What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?</i> <p>It is proposed that we will have three breakout groups, each of which will be allocated one of the evidence streams - 'big ideas' associated campaigns (page 25), modelling of potential impact of different policy mixes (page 28) and effectiveness of different policies and policy mixes (page 30). Each breakout group will also be able to move onto a second topic if they feel they have completed the first.</p> </div> <div> Breakout groups to consider evidence types 10-13 (evidence to support a framework that motivates policy change and intervention) <p>Each breakout group will address the following questions for one or more evidence types (there is a discussion note provided for each evidence type):</p> <ol style="list-style-type: none"> <i>Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?</i> <i>Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?</i> <i>What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?</i> <p>It is proposed that we will have two breakout groups, one focused on the two evidence streams associated with the Aichi Biodiversity Targets - review of previous experience (page 35) and lessons learnt from application at the national level (page 39), and the other on the other two evidence streams on effectiveness and uptake of targets (pages 42 and 45). Each breakout group will also be able to move onto a second topic if they feel they have completed the first.</p> </div> </div>
13:00-14:00	Lunch
14:00-15:30	Plenary <ul style="list-style-type: none"> Report back from breakout groups Questions and discussion on any key issues arising Introductory presentation on evidence types 8-9 (<i>Natasha Ali, IUCN</i>) Introductory presentation on evidence types 14-16 (<i>Andreas Obrecht, UN Environment</i>) Introduction to the tasks for breakout groups
15:30-16:00	Coffee break

16:00-18:00	<p>Breakout groups to consider evidence types 8-9 (evidence to support identification of policy instruments/tools most likely to be effective)</p> <p>Each breakout group will address the following questions for one or more evidence types (there is a discussion note provided for each evidence type):</p> <ol style="list-style-type: none"> 1. <i>Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?</i> 2. <i>Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?</i> 3. <i>What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?</i> <p>It is proposed that we will have three breakout groups, two focused on <i>appropriateness and effectiveness of interventions</i> (page 31) and the other on <i>effective mobilization of resources</i> (page 33).</p>	<p>Breakout groups to consider evidence types 14-16 (evidence to support monitoring and reporting that promotes implementation)</p> <p>Each breakout group will address the following questions for one or more evidence types (there is a discussion note provided for each evidence type):</p> <ol style="list-style-type: none"> 1. <i>Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?</i> 2. <i>Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?</i> 3. <i>What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?</i> <p>It is proposed that we will have two breakout groups, one focused on <i>evidence indicators</i> (pages 53 and 56) and the other on <i>review and reporting</i> (page 59).</p>
19:00	<p>Dinner at Magdalene College (the address with a map of the College can be found in the logistics information document)</p>	

Thursday 12 April	
09:00-10:30	Plenary <ul style="list-style-type: none"> • Report back from breakout groups • Questions and discussion on any key issues arising • Consideration of issues identified during the meeting still to be discussed • Introduction to the tasks for breakout groups
10:30-11:00	Coffee break
11:00-12:00	Breakout groups to consider any new evidence identified during the meeting Each breakout group will address the following questions for one or more evidence types: <ol style="list-style-type: none"> 1. <i>Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?</i> 2. <i>Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?</i> 3. <i>What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?</i> <p>Exactly how this session will work depends on what new evidence streams are identified during the meeting, or on what additional work is identified as a result of discussions in previous sessions.</p>
12:00-13:00	Plenary <ul style="list-style-type: none"> • Report back from breakout groups • Questions and discussion of any key issues arising • What happens next (<i>Jerry Harrison, UNEP-WCMC</i>) • Closing remarks (<i>Alexander Shestakov, CBD Secretariat</i>) • Closing remarks and invitation to panel discussion and reception (<i>Mike Rands, CCI</i>) • Close of the meeting (<i>Spencer Thomas, Grenada</i>)
13:00-14:00	Lunch

What do we expect from participants?

Purpose of this document: The purpose of this document is to help you as participants prepare for the expert workshop that will take place in Cambridge, United Kingdom from 10-12 April 2018. A significant part of the workshop will comprise discussion amongst participants, so the more you prepare yourselves in advance for the discussion, the greater will be your input, and the richer the outcome of the workshop.

Context for your work: In 2020, governments are likely to adopt a post-2020 global biodiversity framework of some form to succeed the *Strategic Plan for Biodiversity 2011-2020* and its *Aichi Biodiversity Targets*. The process for developing the post-2020 global biodiversity framework has yet to be agreed, but to be effective the framework will need to build on existing knowledge and experience. The purpose of this workshop is to help identify:

- the knowledge required to support development of the post-2020 global biodiversity framework
- the primary sources of such knowledge
- opportunities for improving access to the necessary knowledge by those developing the framework

Intended output from the meeting: Our ultimate intention is to develop an ‘information document’ to inform Parties to the Convention on Biological Diversity of the types of knowledge that they might want to consider when developing the post-2020 global biodiversity framework. The expert workshop will provide substantive input to the information document, but this document will not be based on the results of the discussion alone. The information document will also draw on other materials currently in development (see below).

Overall framework: To date we have grouped the ‘types of evidence’ we think will be needed into five broad categories. We recognise that these categories are to some extent both arbitrary and overlapping, none-the-less they give a good sense of general direction. These ‘categories’, or areas where evidence is needed, concern:

- pathways that will lead us to (or away from) the 2050 Vision already agreed by Governments
- scale and possible mixes of policies that are going to get us on these pathways
- policy instruments and tools that will be most effective in delivering these policies
- the framework (targets) that would motivate such policies and interventions being put in place
- monitoring, indicators and reporting that would promote implementation and accountability

Types of evidence: We have drawn up a list of 16 types of evidence or knowledge that we think will be needed in order to support development of an effective post-2020 global biodiversity framework. These types of evidence are listed on page 11. We have also prepared two-page draft discussion notes on each which can be found from page 13 onwards.

What we expect from you: Consideration of the types of evidence that will be needed for developing an effective post-2020 global biodiversity framework is the primary focus of the meeting. To make the most out of the meeting we are asking you to consider:

- Do we have all the evidence needed for developing an effective post-2020 global biodiversity framework? If not what is missing, and are there any options to provide it?
- Is this evidence made available in such a way that it can be readily used by those developing the post-2020 framework? If not what needs to be done, by whom and by when?
- What are the priorities for addressing any needs and activities identified between now and COP 15 in December 2020?

How you can prepare for the meeting: As previously communicated to you, advance preparation will certainly help you to engage fully in the discussion, and contribute more to the meeting. We suggested that in getting ready to participate you may want to think about the following:

- a) What sort of evidence do you think would help negotiators when developing and adopting a post-2020 global biodiversity framework, and when would it be needed?
- b) For those types of evidence listed in the annex that you are familiar with, do you know where to find the necessary information, and is it in the most useful format?
- c) For those types of evidence you are less familiar with, what do you think it would be useful to know?
- d) Are there any major evidence types missing from the list, and if so can you identify what is missing, what the main sources of the evidence are, and the availability (or otherwise) of that evidence?
- e) Some of the evidence types are far more complex than others, so do some of the evidence types need to be broken down into more than one evidence type or *vice versa*?

Types of evidence identified to date

Evidence that will help identify the pathways that will lead us to (or away from) the 2050 Vision

The 2050 Vision adopted by Parties in 2010 is of a world living in harmony with nature, where *“biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet, and delivering benefits essential for all people.”* In order to develop strategies and actions for achieving this vision it is necessary to understand the current situation, and to be able to evaluate current trends and their implications. It is also helpful to know how change has been achieved in other sectors, in particular in the context of trying to achieve the “transformative change” thought to be necessary for achieving the 2050 Vision. Types of evidence potentially needed include:

1. **Scenario analysis and associated modelling**
2. **Findings from major assessment processes**
3. **Implications of ‘big ideas’ in science (such as “tipping points” or “planetary boundaries”)**
4. **Lessons that can be learned from examples of transformative change in other sectors**

Evidence that will help identify the scale and possible mixes of policies necessary to get on these pathways

During discussions at the 21st meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, Parties requested the Executive Secretary to consider “policy options and recommendations under the Convention that could leverage the transformative change required to achieve the 2050 Vision” when preparing proposals for the process of developing a post-2020 global biodiversity framework. In order to do so it will be important to understand the potential for different policies and policy mixes to generate the level of change needed, and what other impacts the chosen policies and policy mixes might have. Types of evidence potentially needed include:

5. **Implications of ‘big ideas’ associated with campaigns (such as “nature needs half”)**
6. **Modelling of the potential impact of different policy mixes, and understanding trade-offs**
7. **Effectiveness of different policies and policy mixes in effecting change**

Evidence that will help identify the policy instruments and tools most effective in delivering these policies

A wide range of interventions are available for delivering policy and change in policy, ranging from establishment of protected areas to use of incentives, and from improving communications to increasing integration into other sectors. As the post-2020 global biodiversity framework is developed it will be valuable to understand the effectiveness of different interventions in delivering change, so that more effective approaches can be facilitated as appropriate through the post-2020 global biodiversity framework. Types of evidence needed include:

8. **Appropriateness and effectiveness of different types of interventions in supporting implementation**
9. **Effective mobilization of resources – targets, strategies, policy instruments and tools**

Evidence that will help in defining a framework that would motivate use of such policies and interventions

The *Strategic Plan for Biodiversity 2011-2020* placed significant focus on the Aichi Biodiversity Targets, and in the decision adopting the strategy Parties were invited to themselves develop targets based on the global targets adapted as appropriate to national circumstances. If targets or milestones of some form are to be used in the post-2020 global biodiversity framework, then it will be important to understand experience in setting and using targets in order to inform the development of the most effective targets or milestones. Types of evidence needed include:

10. [Review of previous experience target setting with the Aichi Biodiversity Targets](#)
11. [Lessons learned from interpreting the Aichi Biodiversity Targets at national level](#)
12. [Effectiveness of targets in driving change](#)
13. [Uptake of targets in national planning, businesses etc., and the effectiveness of this](#)

Evidence that would help in defining an associated monitoring, reporting and verification framework

For any form of long term strategy to be effective it needs to have in place some form of monitoring and reporting programme, that uses appropriate metrics and indicators to illustrate change. This is necessary both as part of an adaptive management approach, and to use in communications, and is important at all levels. In order to be able to put in place an effective monitoring, reporting and verification process, it is important to develop it at the same time as developing the post-2020 global biodiversity framework, and importantly the approach to monitoring, indicators and reporting can also inform development of the framework itself. Types of evidence needed include:

14. [Indicators, and how indicators are used](#)
15. [Lessons that assess how indicators can be used to influence change](#)
16. [Reports on implementation, and how reporting systems can drive higher performance](#)

1. Scenario analysis and associated modelling

What knowledge is needed?

1. The 2050 Vision adopted by Parties in 2010¹ is of a world living in harmony with nature, where *“biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet, and delivering benefits essential for all people.”* In order to develop strategies and actions for achieving this vision it is necessary to understand the current situation, to be able to evaluate current trends and their implications, and to explore how alternative policies and socio-economic developments may affect this trajectory.
2. Scenario analysis has emerged as a useful methodology for analysing uncertain future pathways for complex social-ecological systems, supporting strategic decision making that anticipates opportunities and seeks to adapt to changes and to avoid unintended consequences. To determine the trajectories of biodiversity and ecosystem services, and how they might be expected to change over time, we can use projections of trends often generated by models and informed by specific scenarios of socio-economic development and climate.
3. Scenarios and the associated use of models can help to explore the interactions in terms of trade-offs and synergies between biodiversity conservation and other economic sectors, and can help in understanding how biodiversity and ecosystem services can become more integrated into growth and development processes. They can also help to inform policy decisions around reducing the direct pressures on biodiversity and ecosystem services, and by providing information related to the safeguarding of ecosystems, species and genetic diversity. As a result potential value of scenarios in considering the 2050 vision have been summarised for SBSTTA.²

What are the primary sources of such knowledge?

4. The value of using scenarios and models has been explored by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which carried out a methodological assessment of the range of approaches to modelling and scenario development, and the ways in which the results of such exercises could be of value in agenda setting, policy design and implementation at multiple levels.^{3,4}
5. A wide range of modelling and scenario studies have been carried out for biodiversity and ecosystem services at a range of spatial scales from local to global. A number of these were considered when developing the fourth edition of the Global Biodiversity Outlook (GBO-4)⁵ and are explored in the associated technical report.⁶ Such models and scenarios are also being considered as part of the IPBES regional assessments due to be completed in March 2018, and the IPBES global assessment due for completion in May 2019. In addition there are several other ongoing exercises at the global scale including the Inter-Sectoral Impact Model Intercomparison Project ISIMIP, the WWF “Bending the

¹ CBD COP [decision X/2](#) on the Strategic Plan for Biodiversity 2011-2020

² Document [CBD/SBSTTA/21/2](#) on scenarios for the 2050 vision.

³ IPBES (2016) Summary for policymakers of the methodological assessment of scenarios and models of biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Ferrier, S. et al. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 32 pages.

⁴ IPBES (2016) The methodological assessment report on scenarios and models of biodiversity and ecosystem services. Ferrier, S. et al. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 348 pages.

⁵ Secretariat of the Convention on Biological Diversity (2014) *Global Biodiversity Outlook 4*. Montreal, 155 pages.

⁶ Leadley, P.W. et al. (2014) Progress towards the Aichi Biodiversity Targets: An Assessment of Biodiversity Trends, Policy Scenarios and Key Actions. *Technical Series 78*. Secretariat of the Convention on Biological Diversity, Montreal, Canada. 500 pages.

Curve” initiative, and the sixth edition of the UN Environment Global Environmental Outlook (due for release in early 2019).

6. Many of these initiatives make use of the currently available scenario information generated for the Intergovernmental Panel on Climate Change (IPCC). For climate, the Representative Concentration Pathways (RCPs) describe particular greenhouse gas concentration and radiative forcing pathways. For socioeconomic conditions, the Shared Socioeconomic Pathways (SSPs) describe particular combinations of socioeconomic development, population growth and governance, which affect trajectories of global change into the future. The latter are particularly relevant for biodiversity and ecosystem service, and information on this has been summarised recently for SBSTTA.⁷

7. Information on modelling and scenarios from these ongoing initiatives should become available during 2018/2019. In the interim a summary of future projections was made available to SBSTTA in 2017⁸ to communicate how scenarios and models can help to inform achievement of the 2050 Vision. Meanwhile, following completion of the IPBES methodological assessment on models and scenarios, an expert group has continued to work on ways to integrate biodiversity into scenario development and address the full range of social-ecological feedback, including among biodiversity change, ecosystem services and human well-being, and consideration of individual and institutional responses to biodiversity changes.⁹

Are there ways in which delivery and use of the knowledge could be improved?

8. The global initiatives described above are expected to provide policy relevant syntheses of future pathways for biodiversity and ecosystem services. The results of these initiatives are likely to support and reinforce high-level findings about how to best ensure pathways that lead towards, rather than away, from the 2050 Vision, and their value is already recognised by SBSTTA,¹⁰ which requested the Executive Secretary to “*make provisions for sound analytical work*” when preparing proposals for the process for developing the post-2020 global biodiversity framework, to “*ensure that this framework is based on the best available evidence*”.

9. With several, largely independent, initiatives underway considering pathways to the future, that are likely to report during 2018, there will be a *critical need to meta-analyse these different studies and identify key decisions to take for pathways to lead towards the 2050 Vision*. It is to be hoped that this will be carried out as part of the work already requested by SBSTTA.

10. Further work is also needed to consider several critical elements that are currently absent from scenario/pathways studies.

a) It will be important to *consider how biodiversity and ecosystem services might feedback on socio-economic conditions that are currently prescribed externally* to force the models. Current scenario studies largely ignore the fact that impacts on biodiversity can then affect socio-economic conditions.

b) Terrestrial, marine and freshwater aquatic systems are largely considered independently. Work should be undertaken to *consider how interdependencies between different realms could influence the conclusions of pathway analyses*. For example, assumptions about provision of protein from fish into the future impact and are impacted by terrestrial agriculture decision making.

c) There is a *need to further assess the uncertainties associated with pathways*. Previous analyses have indicated that differences between models can give rise to more variation in biodiversity

⁷ Information document [CBD/SBSTTA/21/INF/4](#) on summary of the shared socioeconomic pathways.

⁸ Information document CBD/SBSTTA/21/INF/2 on review of future projections of biodiversity and ecosystem services.

⁹ Information document [CBD/SBSTTA/21/INF/18](#) on multi-scale, cross-sectoral scenarios for nature futures.

¹⁰ CBD SBSTTA [Recommendation XXI/1](#) on scenarios for the 2050 vision.

trajectories than differences in the scenarios describing different pathways. More work should assess whether this holds for ongoing scenario studies and what the implications are for decision-making.

d) There are a number of *important drivers of biodiversity change currently missing from scenario studies*. For example, offtake of animal and plant resources in terrestrial environments and the impacts of invasive species, but it is not known how significant these omissions are and how this might impact decision making.

11. Other aspects of modelling and scenarios are more relevant to assessing the potential impact of different policies and policy mixes, and this is addressed in *Discussion Note 6 on evidence relating to the scale and possible mixes of policies* that will get us onto the pathways that will lead to the 2050 Vision.

DRAFT

2. Findings from major assessment processes

What knowledge is needed?

1. During the development of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), a number of documents were prepared to review the assessment landscape, and to identify where gaps in that landscape were that might be addressed by IPBES.^{11,12,13} These documents, which were quite heavily used in drafting the following, also identified the purpose and characteristics of assessments and assessment processes, and how and why the knowledge they contained was useful.
2. Essentially assessments are formal efforts to gather, review and synthesise knowledge in a manner that makes it accessible to decision makers and their advisors, thereby supporting decision-making on complex issues. They are communication processes that share a number of key features irrespective of topic or discipline. Effective assessments are conducted by credible groups of experts who bring a wide range of relevant experience and expertise to bear on the issues being assessed, synthesizing broadly diverse information into useful summaries that indicate areas of general agreement (often indicating degrees of certainty) and areas in which further investigation is required.
3. CBD COP 13 decided that the fifth Global Biodiversity Outlook (GBO-5) should provide a basis for the follow-up to the Strategic Plan for Biodiversity 2011-2020,¹⁴ and CBD SBSTTA has recommended that IPBES assessments should also be taken into account during the process for developing the post-2020 global biodiversity framework.¹⁵ The expectation is that the findings of these assessments would help to frame the post-2020 global biodiversity framework, and will also help in identifying priorities.

What are the primary sources of such knowledge?

4. By their very nature, any assessment processes relating to biodiversity and ecosystem services will deliver findings that are relevant in some manner to development of the post-2020 global biodiversity framework. However some assessments have been explicitly identified as important in understanding progress in addressing the Aichi Biodiversity Targets, which is itself identified as an essential element of the process for development of the post-2020 global biodiversity framework.
5. Previous editions of the GBO have provided syntheses of knowledge that have been used by the CBD in review of progress in achieving its objectives, and have supported the identification of future priorities based on evidence of past progress. Each edition of the GBO (four have been produced to date) has variously drawn on national reports to the convention, scenarios, indicators derived from global datasets, and other assessments. The process for development of the GBO-5 was initiated by CBD COP 13, and is due for completion in May 2020.^{16,17} COP 13 advised that this edition should *inter alia* draw on the thematic, regional and global IPBES assessments.
6. IPBES has already completed two thematic assessments and four regional assessments, and work is under way on a global assessment which will be completed in May 2019. The thematic assessment

¹¹ Information document [UNEP/IPBES/2/INF/2](#) on a gap analysis for the purpose of facilitating the discussions on how to improve and strengthen the science-policy interface on biodiversity and ecosystem services.

¹² Information document [UNEP/IPBES/3/INF/1](#) on analysis of the assessment landscape for biodiversity and ecosystem services.

¹³ Information document [UNEP/IPBES/3/INF/1/Add.1](#) with an executive summary of the analysis of the assessment landscape for biodiversity and ecosystem services.

¹⁴ COP [decision XIII/29](#) on the Global Biodiversity Outlook and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

¹⁵ SBSTTA [recommendation XXI/1](#) on scenarios for the 2050 Vision.

¹⁶ COP [decision XIII/29](#) on the Global Biodiversity Outlook and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

¹⁷ SBSTTA [recommendation XXI/5](#) on the fifth edition of the Global Biodiversity Outlook.

on pollinators, pollination and food production was completed in 2017,¹⁸ and the thematic assessment on land degradation and restoration in 2018.¹⁹ Regional assessments were completed in 2018 for Africa, the Americas, Asia-Pacific and Europe and Central Asia.²⁰ The global assessment will be based on a scoping document agreed in 2016, which drew on an earlier request from the CBD for evidence.^{21,22} No other IPBES assessments will be completed prior to CBD COP 15, although others are under way.

7. A range of other relevant assessments have been delivered through intergovernmental processes over the past ten years, including those on the status of genetic resources produced by the Commission on Genetic Resources for Food and Agriculture,²³ the Global Forest Resources Assessment,²⁴ the World Ocean Assessment,²⁵ the Global Environment Outlook,²⁶ and those produced by the Intergovernmental Panel on Climate Change.²⁷ Others include the report on the State of the World's Wetlands being prepared for Ramsar COP 13 or the Arctic Biodiversity Assessment,²⁸ and more focused assessment processes such as the IUCN Red List Assessment,²⁹ the Living Planet Report,³⁰ the State of the World's Birds,³¹ and the State of the World's Plants.³² Indeed there is a broad range of synthesis research which delivers a number of different types of output intending to inform policy development and decision making processes.

8. It should be noted that the findings of assessments and other types of synthesis research may well help to inform other types of evidence, including, for example, evidence from scenario analysis (*Discussion Note 2*) and evidence on the appropriateness and effectiveness of different types of interventions for delivering policy (*Discussion Note 8*).

Are there ways in which delivery and use of the knowledge could be improved?

9. As is indicated above, a process is already under way for preparation of GBO-5. Although the report itself will not be launched until May 2020, it is expected that draft materials will be made available to support development of the post-2020 global biodiversity framework.

10. Based on the COP decision and SBSTTA recommendations identified above, it can be assumed that development of the GBO will draw on the thematic, regional and global assessments of IPBES. However, these findings will inevitably be incorporated in GBO-5 in a synthesised manner. It is also currently unclear to what extent the findings of other assessments will be taken into account.

11. In order to inform those developing the post-2020 global biodiversity framework, it may be appropriate to ***compile into a single document the high level messages and/or key findings from major assessments*** so that these can be considered as appropriate by those developing the post-2020 global biodiversity framework. Presentation of these kinds of synthetic summaries of the major assessments together with appropriate references will allow follow-up where necessary.

¹⁸ See IPBES Assessment reports <https://www.ipbes.net/assessment-reports-0>.

¹⁹ Reference will be included as soon as the assessment report is available following final editing.

²⁰ Reference will be included as soon as the assessment report is available following final editing.

²¹ Annex I to IPBES Plenary [decision IPBES-4/1](#) on the work programme of the Platform.

²² Document [UNEP/CBD/SBSTTA/17/4/Rev.1](#) on the contribution of the convention to the IPBES inter-sessional process.

²³ See <http://www.fao.org/nr/cgrfa/cgrfa-home/en/>.

²⁴ See <http://www.fao.org/forest-resources-assessment/en/>.

²⁵ See http://www.un.org/depts/los/global_reporting/global_reporting.htm.

²⁶ See <http://web.unep.org/geo/>.

²⁷ See <http://www.ipcc.ch/>.

²⁸ See <https://www.caff.is/assessment-series/233-arctic-biodiversity-assessment-2013>.

²⁹ See <http://www.iucnredlist.org/technical-documents/assessment-process>.

³⁰ See http://wwf.panda.org/about_our_earth/all_publications/lpr_2016/.

³¹ See <http://www.birdlife.org/worldwide/news/state-worlds-birds>.

³² See <https://stateoftheworldsplants.com/>.

3. Implications of ‘big ideas’ in science

What knowledge is needed?

1. Academic research can lead to fundamental changes in our understanding of how the world works. This provides a greater understanding of the impact of human activities on the natural world (both real and expected), the socio-economic consequences of these changes, and what needs to be done to mitigate the impact. Such research, whether in the natural or social sciences, can occasionally bring an issue to life and grip the public’s imagination. In these cases it can be hard to identify where science ends and environmental campaigning begins.
2. When developing the post-2020 global biodiversity framework it will be important to identify existing big scientific ideas and their potential implications for this future framework. In addition, all these big scientific ideas will need an evaluation of their science, an assessment of the extent that they are accepted within the scientific community, and their potential for contributing meaningfully to the post-2020 global biodiversity framework.
3. Note that it is not always easy to separate big ideas in science (such as ‘tipping points’) from big ideas associated with campaigns which use science as part of their argument (such as ‘nature needs half’). The latter are addressed in *Discussion Note 4*.

What are the primary sources of such knowledge?

4. The following are examples of areas where significant developments in the sciences are generating new ideas and approaches that have implications for how we understand and manage the world around us. As such they are all potentially relevant to development of the post-2020 global biodiversity framework.
5. *Scenarios and models*: Scenarios and models are widely used to inform discussions relating to the environment, climate change and human wellbeing and will play a vital role in outlining possible measures to achieve the 2050 Vision. As sources of knowledge relevant to development of the post-2020 global biodiversity framework, these have been articulated in *Discussion Note 1*, and are not discussed further here.
6. *Tipping points*: The concept of tipping points, critical transitions which, if passed, result in radical and potentially irreversible shifts in the biosphere has been debated for a number of years³³³⁴³⁵. Whilst tipping points have been shown in some habitats, for example the impacts of eutrophication of lakes and oceans³⁶, inputs of aerial nitrogen to acid bogs³⁷ recurrent bleaching of coral reefs due to climate change³⁸, the complexity of ecosystems presents a number of challenges to identify tipping points more broadly. Challenges include: how can tipping points be detected; what are the consequences of passing them (e.g. for the resilience of the system, the delivery of ecosystem goods and services and the state of biodiversity); and once passed will they recover, and if so, to what state?
7. *Planetary boundaries*: Conceptually similar to “tipping points”, the “Planetary Boundaries framework seeks to define a safe operating space for humanity based upon nine “boundaries”, which if transgressed, may result in the biosphere leaving the Holocene state that has proven favourable to

³³ Hughes, T.P., Kerry, J.T., and Wilson, S.K., 2017. Global warming and recurrent mass bleaching of corals. *Nature* 543, 373-377

³⁴ <https://www.sciencedirect.com/science/article/pii/S2212041613000600>

³⁵ <https://www.cedarcreek.umn.edu/sites/default/files/public/downloads/t1758.pdf>

<https://www.sciencedirect.com/science/article/pii/S2212041613000600>

³⁶ Smith, V.H., Tilman, G.D. Nekola, J.C. (1999). Eutrophication: impacts of excess nutrient inputs on freshwater, marine, and terrestrial ecosystems

³⁷ Jones et al. 2014

³⁸ Huges et al. 2017

humanity, and potentially entering a less favourable start³⁹. A “planetary boundary” is different to a “tipping-point” in that it is located well-before a significant change occurs, and thus is located significantly before the tipping point is reached. Whilst there are many proponents of the Planetary Boundaries concept, there are also critics who question which boundaries are most relevant, and how or whether they can be usefully quantified given our current level of understanding.

8. The *Human Footprint* was developed in 2002 and updated in 2016⁴⁰. It brings together a number of different spatial layers and is able to show the remaining parts of the world that are relatively pristine and hence should be targets for conservation⁴¹. Such ideas have developed from research advocating for the importance of wilderness⁴² or focused on the conservation of roadless areas⁴³. This thinking is more common in North America, Australia and the developing world than in Europe – primarily because there is more wild land remaining in these regions and a more intact megafauna able to move across the landscape.

9. *Bending the curve - Restoring nature to our planet*: This big idea has used the IIASA GLOBIOM integrated assessment model to assess the impacts of different socio-economic, climate change, and land use allocation pathways on biodiversity trends. Specifically the model has been used to change input parameters to reverse ongoing biodiversity loss and to change the downwards trend in different biodiversity metrics until 2020, to become upwards trends from 2030 and to 2050⁴⁴. Biodiversity is measured using a variety of metrics, including the IUCN Red List Index (extinction risk), the WWF/ZSL Living Planet Index (abundance), the PREDICTS model’s Local Biodiversity Intactness Index and the Madingley Model’s functional diversity measures⁴⁵. Publications are in preparation on methods and model outputs, and aim to be available and used in the WWF Living Planet report 2018 and, hopefully, the IPBES global assessment.

10. *Connectivity conservation*: Recognition that habitat fragmentation was leading to species loss, and reduction in ecological functionality has led in recent years to an increased focus on connectivity and ecological networks, particularly with respect to protected areas planning⁴⁶. Connectivity approaches have been recommended by conservation scientists for several decades and connectivity between protected areas is embedded within Aichi Target 11. Many analyses have been completed on connectivity for habitats and species^{47,48}, and between protected areas and other sites.

11. *Land sparing versus Land sharing*⁴⁹: Recent evidence suggests that species respond negatively to land use change and the majority of species are dependent on wild habitats for their persistence. This finding strongly underscores the requirement for ambitious conservation targets. Second, for very many species their population densities on farmland are relatively insensitive to rising farm yields.

³⁹ Steffen et al. (2015). Planetary boundaries: Guiding human development on a changing planet; Vol. 347, Issue 6223.

⁴⁰ Venter, O., et al. (2016). Sixteen years of change in the global terrestrial human footprint and implications for biodiversity conservation, Vol 7.

⁴¹ Watson, J.E.M., et al. (2016), Catastrophic Declines in Wilderness Areas Undermine Global Environment Targets. *Current Biology*, Vol. 21

⁴² Noss, R. (1991) Sustainability and Wilderness, *Conservation Biology*

⁴³ Ibisch, Pierre & Hoffmann, Monika & Kreft, Stefan & Pe'er, Guy & Kati, Vassiliki & Biber-Freudenberger, Lisa & A. DellaSala, Dominick & M. Vale, Mariana & Hobson, Peter & Selva, Nuria. (2016). A global map of roadless areas and their conservation status. *Science*. 354. 1423-1427. 10.1126/science.aaf7166.

⁴⁴ Mace et al. (2018). *In Press*, *Natura Sustainability*

⁴⁶ IUCN Guidelines (2017). Connectivity conservation management: a global guide.

<https://www.iucn.org/content/connectivity-conservation-management-global-guide>

⁴⁷ Crooks, K.R., Burdett, C.L., Theobald, D.M., Rondinini, C. and Boitani, L. (2011). Global patterns of fragmentation and connectivity of mammalian carnivore habitat. *Philos Trans R Soc London B Biol Sci*.

⁴⁸ Gandadharan, A., Vaidyanathan, S., St. Clair, C.C (2017). Planning connectivity and multiple scales for large mammals in a human-dominated biodiversity hotspot. *Journal for Nature Conservation*. Vol. 36.

⁴⁹ Phalan, B. Onial, M., Balmford, Green, R.E. (2011) Reconciling food production and biodiversity conservation: Land Sharing and Land Sparing Compared, *Science* 333, 1289

This means that boosting yields on already-cleared land, if coupled with sparing or restoring habitat elsewhere for nature, could in principle generate the space to meet species' needs.

12. *Dynamic ocean management*: Dynamic ocean management⁵⁰ is an approach that is based on near real-time data on shifting physical, biological and socioeconomic variables to generate responsive dynamic ocean management measures. It has been successfully trialled in a limited number of areas such as the Pacific Groundfish fishery; British Columbia salmon fisheries, and has been shown to result in significant economic gains for fishermen in the New England scallop fishery.⁵¹ However, despite its huge potential and demonstrable benefits, dynamic ocean management requires vast scientific, technological, management, legal and policy capacity, and as such it has been limited to single species and restricted geographic areas. However, this is an emerging concept that has fundamental implications for how we might think about developing approaches to conservation and sustainable use in the ocean.

13. *Mother Earth and related concepts*: A number of different concepts exist around the rights of nature to exist and its role in supporting humanity, and these are, for example, embedded in the IPBES conceptual framework⁵² and the concept of 'Natures Contributions to People'⁵³. These ideas are anthropological and embedded in the traditional knowledge of indigenous and local peoples, and therefore have very profound impact on the ways in land and resources are accessed and used.

14. *Citizen science*: It has been shown that involving local people and community members in monitoring natural resources leads to faster and more appropriate management responses⁵⁴. Citizen involvement also provides empowerment and educational opportunities as well as helping gather vastly more data on status and trends in the environment than is feasible using scientists alone⁵⁵. A hierarchy of citizen science to community-based monitoring approaches exists, each with different strengths and potential for use in monitoring indicators of different environmental agreements.

15. *Horizon scanning*⁵⁶: There are various techniques for identifying future issues that can support and shape local, national and international decision making. Horizon scanning highlights emerging risks and opportunities for the conservation and sustainable of biological diversity, and seeks to bring the issues to appropriate attention before they become serious challenges.

Are there ways in which delivery and use of the knowledge could be improved?

16. Each of the issues described above have potential implications for the post-2020 global biodiversity framework, and there are no doubt other issues that could also have been included. The following actions could be taken over the next two years to ensure that those developing the post-2020 global biodiversity framework have access to knowledge that will help them in their task:

a) Drawing on previous reviews, *carry out an analysis of the 'big issues' that have arisen from the natural and social sciences and other knowledge systems* in order to be able to summaries what are the key issues relevant to development of the post-2020 global biodiversity framework, and what

⁵⁰ Maxwell, S.M et al. (2015) Dynamic ocean management: Defining and conceptualizing real-time management of the ocean, Marine Policy, Vo. 58.

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⁵² Díaz, S. Demissew, S., Carabias, J. et al. (2015). The IPBES Conceptual Framework — connecting nature and people, Current Opinion in Environmental Sustainability, Volume 14.

⁵³ Díaz, S. Pascual, U., Stenseke, M. et al. (2018) Assessing nature's contributions to people. Vol 19: 270-272.

⁵⁴ Danielsen F, Burgess N, Jensen P.M., Pirhofer-Walzl K., Environmental monitoring: the scale and speed of implementation varies according to the degree of peoples involvement, Journal of Applied Ecology. Vol 47, Issue 6.

⁵⁵ Danielsen, F. Burgess, N., Balmford., Monitoring Matters: Examining the Potential of Locally-based Approaches. Biodiversity and Conservation, 2005, Volume 14, Issue 11.

⁵⁶ Sutherland, W. J., Butchart, S. H. M., Connor, B., Culshaw, C., Dicks, L. V., Dinsdale, J., ... Gleave, R. A. (2018). A 2018 Horizon Scan of Emerging Issues for Global Conservation and Biological Diversity. Trends in Ecology and Evolution, 33(1), 47-58. DOI: 10.1016/j.tree.2017.11.006

the implications of these issues are. The analysis should include identification of confidence levels relating to each issue, following the approach used by IPBES.

b) Addressing the suggested action above could be supported by *and international conference to review some of key issues* and to further explore their implications for the post-2020 global biodiversity framework. Alternatively this could be a number of smaller meetings each focused on specific issues.

c) *Consider in particular whether there are further 'big ideas' in the social and behavioural sciences and in other knowledge systems* that are relevant to development of the post-2020 global biodiversity framework, also recognising their potential relevance in addressing other global frameworks, and in particular the Sustainable Development Goals.

d) Consider the potential to *carry out a review of the results of all relevant of horizon-scanning exercises*, and identify how the findings of those exercises might be relevant to achievement of the 2050 Vision, and hence to development and delivery of a post-2020 global biodiversity framework.

4. *Lessons that can be learnt from examples of transformative change in other sectors*

What knowledge is needed?

1. During discussions at the 21st meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, Parties considered scenarios for the 2050 Vision for biodiversity. In doing so they essentially concluded that business as usual scenarios showed continued loss of biodiversity, scenarios for future socio-economic development demonstrated that there is a wide range of plausible futures which take account of achievement of the 2050 Vision, but that pathways towards a sustainable future require transformational change⁵⁷.

2. Transformational change is inherently difficult, often requiring significant behavioural change, but there are examples of such change in other sectors. Moves towards such changes have been discussed in recent meetings of the “Bogis-Bossey Dialogue” convened by the CBD Secretariat with the support of the Government of Switzerland. If key lessons could be learnt from successful experience in other sectors, then this could help those developing the post-2020 global biodiversity framework to identify options for delivering change.

What are the primary sources of such knowledge?

3. *Medicine*: Transformational change in the treatment of many diseases, and in the overall health of whole societies, has been achieved through the gathering and review of evidence, and the improvement in treatment regimes based on that evidence. Medicine now functions largely on evidence, by doing and building on what works, and by stopping what doesn’t. Despite the progress that has been made, significant funds are still invested in medical research, even in systems that are otherwise stretched for resources. This is because there is the expectation – based on experience – that even greater improvements and change are possible. Key to the change has therefore been investment in research and feedback on practice, so as to be able to explore new opportunities, and to better understand and respond to the reasons for success and failure.

4. *Global transparency initiatives*: These includes food labelling in supermarkets, sustainable fish sourcing checklists, certification schemes for timber and fish, and conservation tools like Global Forest Watch,⁵⁸ Global Fishing Watch⁵⁹ and the supply chain monitoring tool TRASE.⁶⁰ Each of these can be argued to have been transformational, or have the potential to be so. Use of Global Forest Watch and Global Fishing Watch can transform both forest conservation and fisheries management, and TRASE can reduce the impacts of commodities supply chains. However, as these conservation transparency tools are all still being developed, knowledge on their impacts has not yet been compiled.

5. *Energy*: In recent years there has been a massive change in the systems of energy supply globally. In the 1970s ‘alternative’ energy sources such as wind, solar, hydroelectric and tidal power were suggested as alternatives to fossil fuels and nuclear power. Mainstream energy suppliers were resistant to change, but various factors, including consumer choice, technology development, price declines, and global concern over climate change has tipped the balance in favour of renewable energy for electrical power generation and increasingly for transportation, industry and domestic heating.⁶¹ These changes are now occurring globally and whole continents, for example Africa, Asia and South America may partly skip fossil fuel energy generation and move to renewables. This has many ramifications, including geopolitical.

⁵⁷ CBD SBSTTA [recommendation XXI/1](#) on scenarios for the 2050 Vision for Biodiversity.

⁵⁸ <http://www.globalforestwatch.org/>.

⁵⁹ <http://globalfishingwatch.org/>.

⁶⁰ <https://trase.earth/?lang>.

⁶¹ See <https://www.weforum.org/agenda/2017/09/next-energy-revolution-already-here/>.

6. *Climate change*: Since the 1970s there has been an awareness in the scientific community that the global climate was changing and that emissions of carbon dioxide and other gases were facilitating the earth retaining heat. Decades of detailed science, increasingly coordinated by the Intergovernmental Panel on Climate Change (IPCC) after its establishment in 1988, have created a vast amount of knowledge of the Earth's climate system and how it is changing and the role of humans and their activities in that change. Linked communication activities from the IPCC, but also involving numerous NGOs and activist groups, have raised the profile of each successive IPCC report, with ever increasing understanding among politicians, the general public, and companies. A total of 175 nations have ratified the Paris Climate agreement to date.

7. *Digital revolution*: Within living memory the growth in the use and potential of information and communication technologies has without doubt been truly transformational. We all have data, information and entertainment at our fingertips, and can potentially access it anywhere in the world. We are able to communicate and share details of our lives in a manner that was inconceivable just a few decades ago. This has had huge benefits, including with respect to the conservation and sustainable use of biodiversity and ecosystem services. It has substantially facilitated research, it has revolutionised site-based management, and so on. However it has also facilitated negative impacts, including, for example, poaching. Transformational change is not necessarily something that can be controlled, so if we are trying to achieve it all potential implications should be considered.

8. *Plastics*: The recent change in attitude towards the use and impact of plastics seems to be bringing about an economic, social and technological revolution. There are many examples of efforts being made in science as well as in society to devise policies and innovative strategies for plastic waste management, use of biodegradable plastics especially in packaging, and educating people for their proper disposal. Fundamental to this change in attitude has been effective communication on the issue over a sustained period, coupled with the fact that in many parts of the world – and in particular where consumerism is higher – there is a clear recognition of the need to deal with waste.

9. *The Tipping Point*: In recent years, discussion of “tipping points” has been concerned with identified thresholds and tipping points that threaten the stability of important Earth system processes, which is discussed in *Discussion Note 3*. However, “The Tipping Point” was introduced earlier as “the moment of critical mass, the threshold, the boiling point” which leads to little things making a big difference.⁶² This approach explains how transformative change happens and the people that need to be involved, from celebrities amongst others who can get the idea noticed in media who make it mainstream, campaigners who build social pressure, and politicians and decision-makers who finally put in place the systems to make the change real. There is considerable social theory behind the process, which could be valuable in informing the post-2020 process on how to build momentum for transformational change.

10. *Transitions*: Transformational change requires a transition which may involve changes in *culture* (shared values, paradigms, worldviews and discourses), *structure* (institutions, economic structures and physical infrastructures) and *practices* (routines, behaviour, action and lifestyles).⁶³ There is a literature on change management which may also yield useful lessons.^{64,65,66,67} This suggests that the enabling factors for sustainability transitions are: a strong and shared narrative that includes a framing of persistent unsustainability and revolutionary long-term direction; a diverse niche-regime frontrunner network of individuals that are able to diffuse, translate, and operationalize the narrative within their own contexts; a diverse set of alternative practices, technologies, business models, and

⁶² The Tipping Point: How little things can make a big difference (2002). Malcom Gladwell.

Pelling, M. (2011). *Adaptation to Climate Change. From Resilience to Transformation*. London: Routledge.

⁶³ Rotmans et al. (2001), Grin et al. (2010).

⁶⁴ Wittmayer & Loorbach, (2016).

⁶⁵ Loorbach et al. (2017) (Annual Review of Environment and Resources).

⁶⁶ See for example <http://www.transitsocialinnovation.eu/>.

⁶⁷ See for example <http://acceleratingtransitions.eu/>.

initiatives that can be presented as building blocks for the transition; and an open end reflexive process of engagement, knowledge development, and learning in which adaptation, exchange, and selection take place.⁶⁸

Are there ways in which delivery and use of the knowledge could be improved?

11. The CBD Secretariat has already been using the Bogis-Bossey Dialogue for Biodiversity as an opportunity to explore the implications and opportunities associated with initiating a transformational process that will contribute to an ambitious post-2020 global biodiversity framework. To date these have exposed issues rather than sought to identify solutions. However they have also brought recognition that while transformational change may lead to new opportunities, it also brings risks as it is not something that can be easily controlled.

12. *Further synthesis of lessons learned is needed with respect to both how transformational change has been achieved in a number of different sectors, and how the associated societal and institutional changes (culture, structure, practice) have been managed.* Such knowledge will help in the development and subsequent implementation of the post-2020 global biodiversity framework. Such synthesis needs to also address the extent to which such changes come about as a result of bottom-up (societal) pressures, as opposed to top-down (policy driven) change.

⁶⁸ Derk Loorbach presentation, Bogis-Bossey Dialogue, 2017.

5. Implications of ‘big ideas’ associated with campaigns

What knowledge is needed?

1. When developing the post-2020 global biodiversity framework, Parties will be exposed to a range of campaigns promoting particular approaches to the conservation and sustainable use of biodiversity. These may relate to the whole of a post-2020 global biodiversity framework, but more often they relate to certain aspects of a possible future framework. All of these ‘big ideas’ share a desire to scale up conservation efforts and ambition. However, their proposals for how and why to do so are very different. When developing the post-2020 global biodiversity framework it will be important to understand what these campaigns and approaches are, and the extent to which they are based on different forms of evidence. This will help those developing the framework as they consider whether and how to use these ideas and the research behind them.

2. Note that most big ideas associated with campaigns have strong links to the scientific literature, and that several big ideas in science are also associated with campaigns. There is therefore a degree of overlap between this section and section 1.3 above. Also note that due to space constraints this document focuses only on particularly prominent and relevant ‘big ideas’ that are linked to campaigns. There may very well be others that should also be considered.

What are the primary sources of such knowledge?

3. *New Conservation* is the title given to a form of conservation that emphasises contribution to human wellbeing, through ecosystem services, as a core goal of conservation. It holds that all non-human nature is impacted by people, that people will not support conservation unless they benefit from it, and that market-based tools and partnership with corporations can make a positive contribution to conservation goals. Supporters favour strategies to integrate biodiversity conservation into a ‘green economy’ through concepts such as natural capital (and associated accounting practices), payments for ecosystem services, and biodiversity offsetting. The main sources of knowledge on this ‘big idea’ are a series of online articles and journal publications authored by its main proponents⁶⁹. These cite a supporting scientific evidence base from the ecosystem services, environmental economics and resilience literatures, as well as major projects such as The Economics of Ecosystems and Biodiversity (TEEB)⁷⁰.

4. *Nature Needs Half* is a campaign calling for 50% of land and seascapes to be protected for nature⁷¹. As such, it is particularly focused on the future of area-based conservation in the post-2020 framework. The campaign takes ‘protected’ to mean inclusion in one of the six categories of Protected Area recognised by the IUCN, some of which allow for limited human presence and use of resources, as well as Indigenous and Community Conserved Areas⁷². This campaign emphasises protection of nature for its own sake in all ecoregions of the world, with adequate connectivity between protected spaces. The main sources of knowledge on this big idea are websites, journal publications and books authored by its main proponents⁷³. These cite a supporting scientific evidence base from the conservation science literature, as well as making a moral argument about the ethics of driving other species to extinction.

⁶⁹ Kareiva, P., et al. (2012). *Conservation in the anthropocene*. Breakthrough Journal Winter. Available from <http://thebreakthrough.org/index.php/journal/past-issues/issue2/conservation-in-the-anthropocene/>;
Kareiva, P. (2014) New conservation: setting the record straight and finding common ground. *Conservation Biology* **28**:634-636.

⁷⁰ <http://www.teebweb.org/>.

⁷¹ <https://natureneedshalf.org/>.

⁷² <https://www.iucn.org/theme/protected-areas/about/protected-area-categories>.

⁷³ Noss, R. et al. (2012) Bolder thinking for conservation. *Conservation Biology* **26**: 1-4;
Dinerstein, E. et al. (2017) An ecoregion-based approach to protecting half the terrestrial realm. *BioScience* **67**: 534-545.

5. *Half-Earth* is the name of a book published by prominent biologist E. O. Wilson in 2016, and the associated ‘half-earth project’⁷⁴. The ‘big idea’ here is similar to ‘nature needs half’, but it is less clear what kind of protection ‘half-Earth’ is calling for. Wilson’s book refers to “a global network of inviolable reserves that cover half the surface of Earth” (p.209), but does not specify whether these should be strict reserves with no human activities, or spanning the range of IUCN categories. The main source of knowledge on this big idea is Wilson’s book, which cites a supporting scientific evidence based from the island biogeography literature as well as making a moral argument about the ethics of driving other species to extinction.

6. *Whole Earth* rejects calls for both the integration of conservation with the market economy and for the radical expansion of protected areas. It calls instead for action to address the underlying drivers of biodiversity loss, which are held to be the structure of the global economic system and widening inequality between people⁷⁵. It argues against the spatial and conceptual separation of people and nature, holding that people are part of nature within one whole-earth system. However, it does not offer a clear proposal for the future of protected areas themselves. This perspective is promoted by a group of critical social scientists working on conservation issues. It overlaps strongly with the position of indigenous people’s campaign groups such as the Forest People’s Programme⁷⁶. It also has links to emerging concepts such as ‘convivial conservation’, which calls for conservation to form part of a new economic system that moves beyond the current focus on growth. The main sources of knowledge for these ideas are journal publications and reports authored by their proponents. These cite a supporting evidence base from the social science literatures on de-growth, social impacts of protected areas, and problems associated with links between conservation and capitalism.

7. *Rewilding*⁷⁷ aims to restore wild species interactions and ecosystem processes. This sometimes includes (re)introducing key species that have themselves been extirpated by humans or to provide processes that have been lost. Rewilding has gained increasing attention from scientists, conservationists and the mass-media and is taking place at various sites. Whilst the importance of large, keystone species to ecosystem functioning and stability is founded on solid theory, there remains debate as to whether humans should play an active or passive role in driving and maintaining this transition. While there is an emerging evidence base around rewilding interventions, there remains a paucity of information demonstrating their wider impacts. As such there is concern that we simply don’t know enough about the mechanisms that underpin such dynamics and as such introducing novel species will have uncertain and potentially disastrous consequences for native ecosystems.

8. Each of the above ‘big ideas’ has received criticism, often from proponents of the other ‘big ideas’. ‘New conservation’ has been criticised by more traditional conservationists who emphasise the protection of nature for its own sake and reject the use of capitalist tools in conservation⁷⁸. ‘Nature needs half’ and ‘half-Earth’ have been criticised by social scientists and new conservationists for seeking to separate people from nature (both physically and conceptually), for the potential human costs of protected area expansion, and for their perceived failure to address the impacts of human

⁷⁴ Wilson, E. O. (2016) *Half-Earth: our planet’s fight for life*. Liveright, NYC, USA. <http://www.half-earthproject.org/>.

⁷⁵ Buscher, B. et al. (2017) Half-Earth or Whole-Earth? Radical ideas for conservation, and their implications. *Oryx* **51**: 407-410.

⁷⁶ Forest Peoples Programme (2016) *Local Biodiversity Outlooks. Indigenous Peoples’ and Local Communities’ Contributions to the Implementation of the Strategic Plan for Biodiversity 2011-2020. A complement to the fourth edition of the Global Biodiversity Outlook*. Moreton-in-Marsh, England.

⁷⁷ Svenning, J-C, Pedersen, P.B. M. Donlan, C. J., Rasmus, E. Faurby, S., Galetti, M. Dennis M. Hansen, B. Sandel, C. J. Sandom, Terborgh, J.W and Vera, F. W. M. (2016). Science for a wilder Anthropocene: Synthesis and future directions for trophic rewilding research. *PNAS* **113** (4) 898-906.

⁷⁸ Soule, M. (2013) The “New Conservation”. *Conservation Biology* **27**: 895-897. Wilson, E. O. (2016) *Half-Earth: our planet’s fight for life*. Liveright, NYC, USA.

activity in the ‘people-half’ of the planet⁷⁹. ‘Whole Earth’ and related thinking has been criticised for promoting intra-species justice for humans at the expense of inter-species justice for other species, and for failing to engage adequately with human population growth or the role of protected areas⁸⁰. ‘Rewilding’ has been criticised for trying to recreate the past and for promoting the fantasy of ‘wilderness’. Debates over the merits and demerits of some of these big ideas have themselves been criticised for their lack of diversity and acrimonious tone⁸¹.

9. It is important to recognise that differences between each ‘big idea’ are about more than different interpretations of the scientific evidence base. They are also the result of different philosophical perspectives on moral questions about the future of human and non-human life on earth. For example, ‘new conservation’ is based on anthropocentric thinking, whereas ‘nature needs half’ and ‘half-Earth’ are based on biocentric or ecocentric thinking⁸². The ‘rightness’ of each philosophical position cannot be resolved through scientific evidence alone⁸³, despite the claims of some campaigns to be entirely science-based⁸⁴. In the context of CBD negotiations an important question is how each big idea might align with the CBD 2050 Vision.

Are there ways in which delivery and use of the knowledge could be improved?

10. To enable a better informed debate about the relative merits of each big idea for the post 2020 global biodiversity framework, further work is needed on the following critical issues.

a) There is currently a lack of detail on precisely what each ‘big idea’ is calling for. *Those promoting each ‘big idea’ need to clarify its position on key questions*, such as the role of protected areas and other effective area-based conservation measures (OECMs), what would happen to non-human nature outside the protected area estate, and how to reconcile human needs (e.g. food production) with protecting biodiversity. The campaigns need to move beyond catchy slogans and begin providing the detail required for the post 2020 global biodiversity framework.

b) There is an *urgent need for research into how each big idea relates to the CBD 2050 Vision and to each of the current Aichi Targets (beyond Target 11)*. For example, the CBD Vision sets out a particular perspective on “living in harmony with nature”, which would appear to be more compatible with some big ideas than others.

c) There is an *urgent need for research into the implications of each ‘big idea’ for the wider delivery of the SDGs*. Each ‘big idea’ is in effect a vision for the future of all life on earth, and therefore cannot be considered in isolation from wider development goals. For example, large scale expansion of the protected area estate as called for by ‘nature needs half’ and ‘half-Earth’ would likely come at a substantial human cost in terms of physical and economic displacement, undermining delivery of several SDGs. However, no detailed research on these social implications of ‘big ideas’ has been conducted to date.

d) Once ‘big ideas’ have been clarified and their implications in multiple domains investigated, it will be necessary to *synthesise knowledge to allow for direct comparison of the ‘big ideas’ and their implications*.

⁷⁹ Buscher, B. et al. (2017) Half-Earth or Whole-Earth? Radical ideas for conservation, and their implications. *Oryx* **51**: 407-410.

⁸⁰ Cafaro, P. et al. (2017) If we want a whole Earth, Nature needs half. A response to Buscher et al. *Oryx* **51**: 400.

⁸¹ Tallis, H. & Lubchenco, J. (2014) Working together: a call for inclusive conservation. *Nature* **515**: 27-28.

⁸² Holmes et al. (2017) Understanding conservationists’ perspectives on the new conservation debate. *Conservation Biology* **31**: 353-363.

⁸³ Wilhere, G. et al. (2012) Conflation of values and science: response to Noss et al. *Conservation Biology* **26**: 943-944.

⁸⁴ E.g. Dinerstein, E. et al. (2017) An ecoregion-based approach to protecting half the terrestrial realm. *BioScience* **67**: 534-545.

6. *Modelling of the potential impact of different policy mixes, and understanding trade-offs*

What knowledge is needed?

1. During discussions at the 21st meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, Parties requested that the Executive Secretary consider policy options and recommendations under the Convention that could leverage the “transformative change” necessary for achieving the 2050 Vision when preparing proposals for the process of developing a post-2020 global biodiversity framework.⁸⁵
2. One of the ways to achieve transformational change is to change policies and associated legislation at global, regional, national and local scales. This kind of change is hard to assess in terms of impacts, as the changes will be complex and spatially varied. However, a number of policy options or packages of policies can be envisaged and then tools developed to test their impacts on biodiversity and ecosystem services now, and potentially into the future. A useful approach to exploring policy options is to use *models* informed by *scenarios*⁸⁶ to explore potential implications and plausible outcomes, which can then help inform development of the post-2020 global biodiversity framework.
3. In order to be able to do this, knowledge about the policies and policy mixes that appear to be consistent with and, more importantly, support the achievement of the 2050 Vision is critical to direct decision making towards achieving that Vision. To make better informed decisions policy makers need to know the range of policy approaches and how they may be used to specifically target areas of societal activities to enable a transition towards greater ecological sustainability taking into account the uncertainties associated with future socio-economic conditions. This information is addressed in other evidence streams.
4. Given any change in policy will have impacts – often beyond those originally intended – it is also important to understand these impacts, both positive and negative, and to understand who the ‘winners’ and ‘losers’ will be and therefore what trade-offs might be necessary.

What are the primary sources of such knowledge?

5. Basic information about scenario analysis and associated modelling is included in *Discussion Note 1*, which was considered when looking at the pathways that will lead us to (or away from) the 2050 Vision. Scenario analysis on land has historically been the preserve of integrated assessment models, which couple representations of socio-economic sectors such as the energy system or the agriculture system, with environmental aspects such as land use decisions and carbon emissions. Within this integrated system, the impacts of different policy options for example, carbon taxes, land protection or dietary shifts can be explored. In the marine environment the approach has been different.
6. The implications of possible policy mixes have typically been explored using storylines or scenarios, which may also be used to force models of plausible futures. Scenarios can support a broad range of questions, such as: what would happen if a particular set of policies were applied in a specific set of socio-economic and climate pathways (exploratory scenarios), how might we achieve a

⁸⁵ CBD SBSTTA [recommendation XXI/1](#) on scenarios for the 2050 Vision for Biodiversity.

⁸⁶ ‘Scenarios’, in the sense used herein, are depictions or storylines of plausible or possible societal futures that can then be used to explore trajectories of biodiversity and ecosystem services, along with a range of policy or management options, into the future. Specifically, following the definition of the IPBES Methodological Assessment on Scenarios and Models of Biodiversity and Ecosystem Services (<https://naturalsciences.ch/service/publications/80013-ipbes-report-on-scenarios-and-models>), scenarios are “plausible representations of possible futures for one or more components of a system, or [...] alternative policy or management options intended to alter the future state of these components.” (IPBES, 2016). ‘Models’ as defined in IPBES (2016) are ‘qualitative or quantitative representations of key components of a system and of relationships between these components’.

particular target (target-seeking scenarios – which are policy prescriptive), or what might the future effects of a specific policy be (policy screening scenarios).⁸⁷

7. Target-seeking scenario analysis is prescriptive in the sense that policy A, B and C appear to be needed for the model to reach Target X. Current target seeking scenarios in development include the WWF “Bending The Curve” initiative, which aims to meet the combined targets of climate change, avoiding hunger and improving biodiversity. More focussed target-seeking policy scenarios have addressed Aichi Target 11, for example showing how a coordinated global expansion of the protected areas estate to reach the 17% target could triple the average proportion of species range and ecoregions protected.⁸⁸ However, future land-use change is projected to make such expansion infeasible unless international action is quickly taken to balance land-use and biodiversity conservation.

8. There are alternative approaches to generating knowledge on policy impact, for example through experimental studies, and using simulation models and games to understand decision making by stakeholders in response to simulated policy decisions. However, policy screening approaches such as these tend to be focused on shorter timescales than other scenario approaches.

9. Other ideas for transformational change, including campaigns such as “half-earth” and “nature-needs-half”, or far reaching ideas such as closing the entire high seas to fishing, could all potentially be translated into storylines, possibly scenarios, and perhaps models which could then be used to assess their potential for delivering desired outcomes. At the same time it would be possible to gain a better understanding of their other social and environmental impacts, both positive and negative, and therefore explore who the ‘winners’ and ‘losers’ might be (which will give a better picture of what trade-offs might be necessary).

Are there ways in which delivery and use of the knowledge could be improved?

10. There are numerous potential policies and policy mixes that could be promoted through a post-2020 global biodiversity framework, many of which are referred to in other evidence streams. Rather than providing analysis for every possible policy and policy mix, including with respect to options for managing trade-offs amongst ‘winners’ and ‘losers’, it may be more effective for those developing the post-2020 global biodiversity framework to identify what policies and policy mixes that anticipate considering, and then commissioning the analysis that will support their work.

11. Meanwhile – or alternatively – it would be possible to compile information on such analyses that have already been carried out or are under way, with summaries of the major findings that might have implications for development of the post-2020 global biodiversity framework. This would build on scenario and modelling work already being undertaken, but with a greater focus on the policies and policy mixes being addressed.

12. In addition the following will need further consideration:

a) There is a *need to better visualise the plausible outcomes that are derived from scenario approaches and associated modelling analyses*, so that they are more understandable and can be more easily communicated;

b) *The trade-offs that emerge from different scenarios and associated modelling need to be translated into decision-making and public friendly outputs* that can be acted upon; and

c) There is a *need to explore what is different about transformational change* – how this will impact the world – and whether there is an appetite to rewire whole ways of thinking and working across the world.

⁸⁷ <https://www.ipbes.net/assessment-reports>.

⁸⁸ Pouzols, F.M. et al. (2014). Global protected area expansion is compromised by projected land-use and parochialism. *Nature*, 516(7531): 383-386.

7. Effectiveness of different policies and policy mixes in effecting change

What knowledge is needed?

1. Parties implement a variety of policy options in order to implement the Strategic Plan for Biodiversity 2011 - 2020⁸⁹ at different scales (local, sub-national, national, regional, and/or global) and under diverse circumstances. Development of the post-2020 framework that addresses biodiversity loss, climate change and the 2030 Agenda for Sustainable Development will be a challenging framework to establish and implement, however there are a range of policy options available. Substantive knowledge is required to identify possible policy mixes (policy instruments are usually used in combination thus as a mix), and scales of application that would support the achievement of the 2050 Vision. To make better informed decisions, policy makers need be aware of the range, and effectiveness of the available policy approaches (see Discussion Note 8).

2. This paper aims to identify some of the knowledge that may help to identify policy options that may contribute towards the development of a post-2020 framework. At the 21st meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, Parties requested that the Executive Secretary consider policy options that could leverage the “transformative change” necessary for achieving the 2050 Vision⁹⁰ when preparing proposals for the process of developing a post-2020 global framework. Parties also noted gaps in the existing suite of policies and tools to address the mainstreaming of biodiversity in different sectors⁹¹.

What are the primary sources of such knowledge?

3. The need for policy to be applicable at multiple scales has been highlighted in modelling and scenario analysis as outlined in Evidence Streams 1 and 6, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) methodological assessments^{92, 93}. These analyses are key inputs to be considered for the design of the post-2020 framework, being also valuable sources at multiple scales.

4. In addition, the fourth edition of the Global Biodiversity Outlook (GBO4) provides an analysis of the relationships between biodiversity policy measures and broader societal challenges, based on “business as usual” and scenarios for meeting biodiversity, climate and sustainable development objectives, consistent with the 2050 Vision⁹⁴. GBO4 suggests that substantial changes from business-as-usual trends are needed in order to address global challenges, and identifies pathways to the 2050 Vision, representing various mixes of policy measures to deliver these outcomes. GBO4 outlines three potential pathways⁹⁵ each of which would require fundamental changes to society and current implementation of policies under the existing policy frameworks. A coherent package of actions would be required, including: policy frameworks; socioeconomic incentives; public and stakeholder engagement; monitoring; and enforcement.

⁸⁹ <https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf>

⁹⁰ CBD/SBSTTA/REC/XXI/1

⁹¹ CBD/SBSTTA/REC/XXI/4

⁹² IPBES (2016) Summary for policymakers of the methodological assessment of scenarios and models of biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. S. Ferrier, K. N. Ninan, P. Leadley, R. Alkemade, L.A. Acosta, H. R. Akçakaya, L. Brotons, W. Cheung, V. Christensen, K. A. Harhash, J. Kabubo-Mariara, C. Lundquist, M. Obersteiner, H. Pereira, G. Peterson, R. Pichs-Madruga, N. H. Ravindranath, C. Rondinini, B. Wintle (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 32 pages.

⁹³ IPBES (2016) The methodological assessment report on scenarios and models of biodiversity and ecosystem services. S. Ferrier, K. N. Ninan, P. Leadley, R. Alkemade, L. A. Acosta, H. R. Akçakaya, L. Brotons, W. W. L. Cheung, V. Christensen, K. A. Harhash, J. Kabubo-Mariara, C. Lundquist, M. Obersteiner, H. M. Pereira, G. Peterson, R. Pichs-Madruga, N. Ravindranath, C. Rondinini and B. A. Wintle (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 348 pages.

⁹⁴ <https://www.cbd.int/gbo/gbo4/publication/gbo4-en.pdf>

⁹⁵ CBD/SBSTTA/21/2

5. Projections from global and national indicators can also inform the development of the post-2020 framework by providing insights on different types and scales of policies that could be used to achieve diverse outcomes. For example, projected trends in two indicators of population abundance (Geometric Mean Abundance) and extinction risk (the Red List Index) under different climate and land-use change scenarios show that under business-as usual scenarios, and by 2050 mean population abundance declines by 18–35%, while extinction risk increases for 8–23% of ungulate species. An alternative sustainable development scenario reduces both extinction risk and population loss, and could lead to population increases⁹⁶. Such scientific assessment can test the effectiveness of policy mixes, and provide inputs into policy planning in order to promote more integrated policy mixes that respond to wider global challenges.
6. Other sources of information about policy mixes and different scales of implementation include: a) National Reports on the implementation of the Convention on Biodiversity (CBD)⁹⁷ b) Global Biodiversity Outlook⁹⁸; c) CBD Clearing-House Mechanism (CHM)⁹⁹; and d) 2030 Agenda for Sustainable Development Voluntary National Reviews Database¹⁰⁰ (see evidence stream 8). However, there is no global level analysis of what scale or mixture of policies can be used to effectively deliver a post-2020 biodiversity framework.
7. Policies in response to goals and targets under other intergovernmental processes can also be a useful resource for identifying policy mixes. For example, the Nationally Determined Contribution (NDC) Registry submission portal¹⁰¹, an online platform where Parties to the Paris Agreement under the United Nations Framework Convention on Climate Change can communicate their NDCs making them publicly available, is one such resource.
8. IPBES assessments also provide valuable knowledge on the effectiveness of available policy options (see evidence stream 8). In particular, they examine different policy ideas and possible options for decision makers at different levels. These options, including policy mixes, include references to diverse policy instruments, market tools, conservation and management practices, spatial and temporal scales, and can even refer to diverse international agreements. Likewise, other assessment processes such as those undertaken under the Commission of Genetic Resources for Food and Agriculture can be valuable.
9. Due to the crosscutting nature of many of the existing challenges, policy measures designed and implemented as a result of developments in other intergovernmental process should also be taken into consideration. For example, analysis of disaster risk management policies established in response to the Sendai Framework for Disaster Risk Reduction adopted by the United Nations International Strategy for Disaster Reduction (UNISDR, 2015), indicate disaster mitigation requires cooperation at different levels (governments, land-use planners and developers)¹⁰².
10. Likewise, processes related to forests, such as the United Nations Conference on Environment and Development (UNCED), the Intergovernmental Panel on Forests (IPF), the Intergovernmental Forum on Forests (IFF), the United Nations Forum on Forests (UNFF), the Committee on Forestry (COFO) of the UN Food and Agriculture Organization (FAO) and the International Tropical Timber Organization (ITTO)¹⁰³ could be considered.

⁹⁶ Visconti, P. *et al.* (2016) Conservation Letters, January/February 2016, 9(1), 5–13

⁹⁷ <https://www.cbd.int/reports/>

⁹⁸ <https://www.cbd.int/gbo/gbo4/publication/gbo4-en.pdf>

⁹⁹ <https://www.cbd.int/chm/>

¹⁰⁰ <https://sustainabledevelopment.un.org/vnrs/>

¹⁰¹ http://unfccc.int/focus/ndc_registry/items/9433.php

¹⁰² Center for International Governance Innovation (2017) Overcoming Barriers to Meeting the Sendai Framework for Disaster Risk Reduction, by Daniel Henstra and Jason Thistlethwaite, Policy Brief No. 105 — May 2017, Canada

¹⁰³ http://enb.iisd.org/process/forest_desertification_land-forestintro.htm

Are there ways in which delivery and use of the knowledge could be improved?

11. The following actions could be explored to inform the development of the post-2020 framework:

- a) Much of the analysis of policy scale and mixes are applicable at the national or thematic level. **A single portal that brings together the range of resources, assessments**, including multiple-scale, multi-sectoral analyses, may provide simplified access to information required to frame a future biodiversity framework.
- b) **Preparation of an analysis of trade-offs and opportunities** from delivering multiple intergovernmental targets/strategies in a coherent manner, while delivering favourable outcomes for biodiversity and ecosystem services. The analysis should identify available policy options.
- c) **Further exploration of policy options using scenario analysis** could provide indications of the needs, scales and mixes based on different desired outcomes. Evidence stream 6 indicates analysis should be commissioned on policy mixes to implement a biodiversity framework, rather than providing analysis for individual policy impacts.
- d) **Compilation of findings from key assessment processes** that have assessed policy options, and other major analyses also referring to these options.

8. *Appropriateness and effectiveness of different types of interventions for delivering policy*

What knowledge is needed?

1. A review of National Biodiversity Strategies and Action Plans (NBSAPs) and national reports, identifies a wide range of policy interventions worldwide, each being used differently under different circumstances. Under the Convention on Biological Diversity (CBD) and in the context of other frameworks such as the 2030 Agenda for Sustainable Development¹⁰⁴, interventions at various scales take the form of, *inter alia*, strategies, plans or programmes, including NBSAPs; sectoral or cross-sectoral plans; or more specific measures such as establishment of a system of protected areas, payments for ecosystem services schemes, or policies for the decentralization of natural resource management¹⁰⁵.
2. The key knowledge required to assess the effectiveness and appropriateness policy interventions required to develop a post-2020 biodiversity framework, is a better understanding of the interventions that are most effective in delivery of the current Strategic Plan for Biodiversity 2011-2020¹⁰⁶, and also of those being used in the context of the 2030 Agenda for Sustainable Development, and other global goals, as appropriate.
3. Analysis of current policy interventions should assess: the extent to which the outcomes expected from different measures are delivered; the likely outcomes from alternative interventions; and what improvements could be made to enhance the effectiveness of appropriate policy measures. Given the variety of governance options, assessments of effectiveness and appropriateness of policy interventions are required at different geographic and administrative scales (site, local, sub-national, national, regional, and/or global).
4. In addition to the efforts at the global scale, policy measures to deliver the current biodiversity framework are often implemented at the national or subnational levels. Parties have adopted a wide range of interventions to assist implementation at the national and/or regional level. Analysis of national policy interventions may therefore provide insights into what are the most effective interventions to be considered in developing the post-2020 global framework, identifying what interventions can be promoted, for example based those that may be scaled up to deliver global level outcomes.
5. Numerous methodologies to evaluating effectiveness and appropriateness for policy interventions exist. This document contains examples of the mechanisms available, used and reported. However, it is not fully comprehensive – it serves as an introduction to further discussions.

What are the primary sources of such knowledge?

6. Several sources can prove valuable for gathering such knowledge. For instance, Parties to the CBD evaluate the effectiveness of measures undertaken to implement the current Strategic Plan via national reports. Approximately 45% of Parties' fifth national reports contain assessments of progress towards the Aichi Biodiversity Targets, including (where possible) information on the methodologies used to assess policy interventions. However, analysis of these national reports found that it is generally difficult to identify methodologies used to assess policy interventions and their impact at the global and/or national level, or to determine what approaches Parties found useful, or to draw conclusions and share lessons learned¹⁰⁷.

¹⁰⁴ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

¹⁰⁵ CBD/SBSTTA/21/7

¹⁰⁶ <https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf>

¹⁰⁷ CBD/SBSTTA/21/7

7. The Clearing-House Mechanism¹⁰⁸ (CHM) can also be considered as a source as it promotes and facilitates scientific and technical cooperation, knowledge sharing and information exchange to: (1) enhance implementation at the global level; and (2) provide a gateway to national clearing-house mechanisms to assess implementation of NBSAPs¹⁰⁹. In 2012, Parties recognised that the CHM could be improved in various ways¹¹⁰.

8. Similarly, the NBSAP Forum¹¹¹, hosted by the Secretariat of CBD, the United Nations Development Programme (UNDP), and UN Environment, supports the revision and implementation of NBSAPs, by providing best practices, guidance and resources online. For example, the Best Practice Knowledge Base¹¹², is a library of best practices related to NBSAPs. Analysis of NBSAPs¹¹³ reveals that Parties' choice of interventions is dependent on a range of different issues, ranging from broad policy considerations, to institutional frameworks, financial capacity and other issues relevant at the national level. The extent to which national interventions deliver towards a global framework has also been assessed using various methodologies^{114, 115}.

9. There is a large amount of literature and guidance related to the assessment of the effectiveness of interventions. For example, [CBD/SBSTTA/21/7](#) provides an analysis of the types of evaluations of policies to implement the CBD, including: programme theory evaluation; case study evaluation; formative/developmental evaluation; before-and-after comparisons; actual-versus-planned comparisons; counterfactuals; and economic evaluations e.g. payments for ecosystem service delivery¹¹⁶.

10. An example of a programme theory evaluation is the fitness check undertaken by the European Commission (EC), of the European Union Nature Legislation (Birds and Habitats Directives)¹¹⁷, to assess the relevance of the legislation for its desired objectives. Based on the findings of the Fitness Check, the EC developed an Action Plan¹¹⁸ to address any shortcomings identified during the evaluation.

11. Counterfactual analysis is used to compare situations either with or without exposure to a measure. For example, IUCN's analysis of the observed extinction risk status of all 235 ungulate species with their estimated status under counterfactual scenarios found that conservation actions had been effective in preventing extinctions, supporting recovery of populations and curbed declines in biodiversity¹¹⁹.

12. Other examples of types of sources that can be useful include: an example of both a thematic assessment and an economic evaluation of policy interventions is an audit on the prevention of the introduction of invasive species carried out by the National Audit Office of the United Kingdom of Great Britain and Northern Ireland¹²⁰; and reviews of legislation, for example relating to environmental impact assessments and strategic environmental assessments¹²¹ or with respect to access and benefit

¹⁰⁸ <https://www.cbd.int/chm/>

¹⁰⁹ <https://www.cbd.int/doc/legal/cbd-en.pdf>

¹¹⁰ UNEP/CBD/COP/11/31

¹¹¹ <http://nbsapforum.net/>

¹¹² <http://nbsapforum.net/knowledge-base/best-practices>

¹¹³ Pisupati, B. & Prip, C. (2015) Interim Assessment of Revised National Biodiversity Strategies and Action Plans (NBSAPs) UNEPWCMC, Cambridge, UK and Fridtjof Nansen Institute, Lysaker, Norway: <https://www.cbd.int/doc/nbsap/Interim-Assessment-of-NBSAPs.pdf>

¹¹⁴ Tittensor, D.P et al. (2014) A mid-term analysis of progress toward international biodiversity. *Science* 346, 241. DOI: 10.1126/science.1257484

¹¹⁵ Birdlife International, Conservation International, RSPB, The Nature Conservancy and WWF (2016) Convention on biological diversity Progress Report towards The Aichi Biodiversity Targets National commitments fall short of action needed to safeguard nature. <https://www.cbd.int/financial/doc/global-2016-targetsreport.pdf>

¹¹⁶ http://jncc.defra.gov.uk/pdf/Report492_webc.pdf

¹¹⁷ http://ec.europa.eu/environment/nature/legislation/fitness_check/docs/nature_fitness_check.pdf

¹¹⁸ http://ec.europa.eu/environment/nature/legislation/fitness_check/action_plan/communication_en.pdf

¹¹⁹ Hoffman, M. et al. (2015) *Conservation Biology*, Volume 29, No. 5, 1303–1313. DOI: 10.1111/cobi.12519

¹²⁰ <https://www.nao.org.uk/wp-content/uploads/2003/10/02031186.pdf>

¹²¹ See UN Environment (2018). *Assessing Environmental Impacts- A Global Review of Legislation*, Nairobi, Kenya

sharing measures¹²², also illustrate approaches used by different countries, and can assess progress being made in achieving specific objectives.

13. Assessments undertaken by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) are also a valuable source given that they include a framework for assessing governance options, and policy instruments. As a result, thematic assessments such as those on pollinators, pollination and food production; and land degradation and restoration; as well as the regional assessments on biodiversity and ecosystem services in the Americas, Asia and the Pacific, Africa, and Europe and Central Asia cover this area.¹²³ The IPBES assessments, including the upcoming global assessment on biodiversity due for release in 2019, are a key element of the global scientific review of the progress made in the implementation of the targets of the current Strategic Plan. It is expected that findings of the global assessment will feed into the preparation of the fifth Global Biodiversity Outlook to be released in 2020, thereby informing the development of the global biodiversity framework post-2020.

14. At the global level, the Global Biodiversity Outlook (GBO) reports on progress towards meeting the global biodiversity goals and potential actions to accelerate progress¹²⁴. This periodic report summarizes data on the status and trends of biodiversity, based on information included in national reports, scientific literature, information from the Biodiversity Indicators Partnership¹²⁵ and supplementary studies. Within each section of the report there are “*Key potential actions that could accelerate progress*” towards each goal, that are derived from the analysis. For example, for Goal B, GBO4 recommends “*developing integrated policies to address habitat loss and degradation, covering positive and negative incentives.... etc.*”.

15. Also at the global level, it is worth noting the analyses of effectiveness of measures taken to implement interventions to deliver current Aichi Targets 11 (on protected areas), 16 (Nagoya Protocol) and 17 (on adoption of NBSAPs as a policy instrument), for which the quantitative components are on track for delivery by 2020¹²⁶. For Target 11, for example, it is likely that the numerical elements of Target 11 on coverage by protected areas and other effective-area based measures will be met. However, it is more difficult to assess management effectiveness and ecological representation at the global level, through national reports. Global level interventions, such as through the IUCN Green List of Protected and Conserved Areas¹²⁷, seek to address this issue. Site-level evaluation methodologies are widely available for assessing management effectiveness of protected areas (PAME). A variety of tools are available, including: the Rapid Assessment and Prioritization of Protected Area Management tool; and the Management Effectiveness Tracking Tool, developed by the World Bank and World Wildlife Fund for Nature. There are currently 17,739 PAME assessments, representing 9,037 protected areas¹²⁸. In 2015, 42 Parties had undertaken PAME evaluations in at least 60% of their protected areas.

16. Another mechanism that could contribute to the discussions is the 2030 Agenda for Sustainable Development [Voluntary National Reviews](#) (VNRs) Database. Member states “conduct regular and inclusive reviews of progress at the national and sub-national levels, which are country-led and country-driven”. These national reviews serve as a basis for reviews by the high-level political forum (HLPF). Regular reviews by the HLPF are voluntary, state-led, undertaken by both developed and developing countries, and involve multiple stakeholders^{129,130}. Like the CHM under the CBD, VNRs aim to facilitate the sharing of experiences, including successes, challenges and lessons learned.

¹²² For example, http://www.cisd.org/aichilex/files/Global%20Overview%20of%20ABS%20Measures_FINAL_SBSTTA18.pdf

¹²³ <https://www.cbd.int/doc/press/2018/pr-2018-03-23-IPBES-en.pdf>

¹²⁴ Secretariat of the Convention on Biological Diversity (2014) Global Biodiversity Outlook 4, Montreal, 155 pages.

¹²⁵ <https://www.bipindicators.net/>

¹²⁶ Secretariat of the Convention on Biological Diversity (2014) Global Biodiversity Outlook 4, Montreal, 155 pages

¹²⁷ <https://www.iucn.org/theme/protected-areas/our-work/iucn-green-list>

¹²⁸ www.protectedplanet.net

¹²⁹ https://sustainabledevelopment.un.org/content/documents/17346Updated_Voluntary_Guidelines.pdf

¹³⁰ Paragraph 84, Resolution adopted by the General Assembly on 25 September 2015, A/RES/70/1

Are there ways in which delivery and use of the knowledge could be improved?

17. For each of the examples of resources above, there is no consistent methodology for reviews of national and global implementation of interventions, and furthermore, the specific methods used to evaluate effectiveness are not generally specified. There is therefore a gap in the evidence available to assess the effectiveness and appropriateness of policy interventions, despite the range of resources available. This issue was recognised by the CBD Subsidiary Body of Technical, Technological and Technical Advice (SBSTTA), and as such, through SBSTTA recommendation XXI/6 Parties requested better sharing of information on the methodologies used in evaluations, including through case studies, as well as lessons learned from these evaluations (as appropriate) through national reports and the CHM, in order to better evaluate policy measures.

18. The following actions could be explored in informing future discussions:

- a) **Voluntary peer reviews** of Parties' evaluations of the effectiveness of policy interventions by COP15;
- b) **Preparation of a synthesis** of reviews of effectiveness of policy interventions implemented since 2012 to date, at both the global and national levels, identifying which interventions have been so far most effective in delivery of the current Strategic Plan. To the extent possible, such analysis could also help to identify what scale and combination of policies that have been more effective in delivering different components of the global framework (see evidence stream 7); and
- c) **Develop a series of briefs** on different intervention types to inform negotiators, detailing the interventions to deliver particular policy goals, why these interventions could be of value, and what expected outcomes they could foster.

9. *Effective mobilization of resources – targets, strategies, policy instruments and tools*

What knowledge is needed?

1. *Greater appreciation of the scale of change needed to achieve the evolving post-2020 framework, so that pathways (across all sectors) to deliver this scale of change can be integrated within any targets.* When the Strategic Plan for Biodiversity 2011-2020 was adopted in 2010 there was no clear idea of what it would actually cost to implement the strategy and achieve the Aichi Biodiversity Targets. As a result any substantive discussion on resource mobilization was effectively delayed on the basis that it was necessary to understand what additional resources Parties required before further commitments could be made. The Aichi targets were essentially established without thought as to how they might be used in helping to find or deliver the necessary resources. To avoid this delay in implementation post-2020, Decision XII/31 (on the multi-year programme of work of the Conference of the Parties up to 2020) already highlights that COP15 should cover “*follow up to the Strategic Plan for Biodiversity 2011-2020 and related means of implementation, including resource mobilization*”. This implies a need to think about the actions and the resources required to deliver the post-2020 framework at the same time developing the framework itself.

2. *Greater understanding of the interactions between targets and resource mobilisation, crucially across all sources and sectors.* The success of Aichi target 20 (which calls for a substantial increase in resources from all sources), will be delivered in part by agreements such as that to double ODA flows to by diversity,¹³¹ but to a far greater extent by the success of targets such as target 2 (to integrate biodiversity into poverty alleviation and planning processes), target 3 (to correct economic incentives) and target 7 (to deliver sustainable agriculture, aquaculture and forestry). Where political will can drive up public investment in biodiversity, such resources must then be used wisely to stimulate ‘crowding in’ of further resources from other actors and sectors, including public finance tackling other connected issues (e.g. climate adaptation and mitigation). Work of the CBD High Level Panel on resources to meet the strategic plan (commissioned initially to substitute for the lack of reporting on resource needs coming from Parties) showed that public money alone will never be able to be the solution to meeting out biodiversity objectives, as the changes needed are, like the drivers of biodiversity loss, effectively across the whole economy.¹³²

3. *Deeper reflection on successes and failures of policy measures and financial instrument use to date:* In order to understand the necessary strategies and actions, questions of the required knowledge becomes about “what works?”; especially in the context of influencing the impact of much larger flows of finance (e.g. primary commodity markets) and their interaction with biodiversity. Practical guidance and evidence is required for Parties and the international community to understand what levers they can use to improve the patterns of investment and resources use across our economies and societies in order to address the post-2020 global biodiversity framework.

What are the primary sources of such knowledge?

4. The issue of resource and investment needs has not been overlooked by the Parties. There have been two phases of work by the High Level Panel¹³² on resources to meet the strategic plan for biodiversity. The findings were broad, but included many examples of successful resource mobilization

¹³¹ Decision XII/3 – Resource Mobilisation: <https://www.cbd.int/decision/cop/default.shtml?id=13366>.

¹³² Details of both phases of the High Level Panel work referenced in this paper as well as details of the Panel make up and sponsorship are available via the CBD website <https://www.cbd.int/financial/hlp.shtml>; a summary document containing the key findings of both phases is available at <https://www.cbd.int/financial/hlp/doc/CBD-HLP-ExecSumm-EN-f.pdf>. Key finding 7 from the High Level Panel’s first report was that *Funding from a diverse range of international and national sources, and across different policy areas is required to secure the full range of economic and social benefits to be gained from meeting the Aichi Targets.*

efforts as well as on the economic case for addressing biodiversity loss and the need to capture better the connections between biodiversity and wider societal goals such as sustainable development and addressing climate change. However, the depth of the key messages were missed, as – for various reasons – Parties focused on the headline numbers (the costs of meeting the Aichi targets at US\$150-440bn/year). Such numbers – if calculated – need to be presented in context; the original High Level Panel Report did this, highlighting that the figures weren't an invoice to the biodiversity community, but represented costs dispersed through the economy, costs which represent behaviour change in sectors which drive biodiversity loss and costs which could be reduced if economic and environmental incentives were better aligned. Some of this thinking in the High Level Panel report has subsequently been captured to some extent in COP decisions e.g. the mainstreaming decision at COP13,¹⁴² and the drive to provide practical advice for Parties has also been recognised, for example with the list of concrete and effective actions to support resource mobilisation that were provided as an annex to decision XII/3, the connections are not direct though.

5. Evaluation evidence for various different biodiversity policy instruments including payments for ecosystem services, water funds and biodiversity offsets as well as the use of tools such as natural capital assessment is advancing all the time with experience. Best practice and the further potential for some of such instruments has been collated in a number of places e.g. in TEEB for Policy Makers in 2011¹³³ (covering PES, subsidy reform, pricing, valuing protected areas and ecological infrastructure), and OECD research on scaling up biodiversity finance¹³⁴ (covering fiscal reform, PES, biodiversity offsets, green products, as well as climate and international development finance). Further evidence on policy use and impact will be found in the IPBES regional assessments and more widely in academic and grey literature.

6. There is also a wealth of evidence (relating predominantly to sources of biodiversity finance and the case for further biodiversity financing) building up from initiatives including but not limited to:

a) BIOFIN¹³⁵, which is helping countries to understand how current patterns of spending drive impacts on biodiversity, and how spending can be changed to have a greater more positive impact.

b) The World Bank's WAVES Partnership¹³⁶ (on Wealth Accounting and the Valuation of Ecosystem Services) / The UN System of Environmental Economics Account – Experimental Ecosystem Accounts work programme (SEEA-EEA)¹³⁷ which are helping countries to understand how the benefits of biodiversity and ecosystem services support the wider economy.

c) The Natural Capital agenda, being progress through projects such as the Natural Capital Project¹³⁸, the Natural Capital Coalition¹³⁹, the Natural Capital Finance Alliance¹⁴⁰ and the Green Growth Knowledge Platform¹⁴¹ which are supporting different groups of decision makers to understand and take account of their impacts and dependencies on nature to encourage better outcomes for people and nature.

¹³³ TEEB (2011), The Economics of Ecosystems and Biodiversity in National and International Policy Making.

<http://www.teebweb.org/our-publications/teeb-study-reports/national-and-international-policy-making/>

¹³⁴ Scaling up finance mechanisms for biodiversity, OECD 2013: <http://www.oecd.org/environment/resources/scaling-up-finance-mechanisms-for-biodiversity-9789264193833-en.htm>.

¹³⁵ <http://www.biodiversityfinance.net/>.

¹³⁶ <https://www.wavespartnership.org/>.

¹³⁷ https://unstats.un.org/unsd/envaccounting/eea_project/default.asp.

¹³⁸ <https://www.naturalcapitalproject.org/>.

¹³⁹ <https://naturalcapitalcoalition.org/>.

¹⁴⁰ <http://www.naturalcapitaldeclaration.org/>.

¹⁴¹ <http://www.greengrowthknowledge.org/themes/natural-capital>.

d) The wider mainstreaming agenda – natural capital approaches are a sub-set of mainstreaming, the mainstreaming agenda is broader and will contain many more lessons which were brought together and taken forward from COP13¹⁴².

All of the above are ongoing and may have important lessons, especially with respect to understanding and influencing the enabling environment in which biodiversity related decisions are made.

7. Similarly, significant knowledge on what has and hasn't worked and how this has been captured in the NBSAPs and subsequent reports on their implementation, is held by Parties themselves.

8. The experience of other conventions, both biodiversity conventions but also wider environmental conventions such as the UN Framework Convention on Climate Change, as well as treaties like the Montreal Protocol (on substances that deplete the Ozone Layer) may also be good sources of understanding of what drives impact and successful resource mobilization.

Are there ways in which delivery and use of the knowledge could be improved?

9. The knowledge base described above is dispersed and disconnected, in some cases located in specialised reports and national experts' heads. It is thus not available for immediate use in developing the post-2020 global biodiversity framework and considering how implementation of that framework will be resourced.

10. There is a *need to synthesise existing evidence, and bring together the 'ingredients' in terms of actions that Parties and the international community need to take* to ensure there is a step change in how biodiversity is perceived and invested in, especially from outside the conservation sector. This is necessary in order to achieve the "transformational change" already being discussed in the context of achieving the 2050 Vision. Often this will be about changing how resources are already used, for example recent estimates suggest we could get over one third of the way to meeting our climate targets cost effectively by investing in ecosystems,¹⁴³ but this is not reflected in spending patterns. We need to synthesis and use such evidence in order to change the way nature is viewed in an economic and investment context, so it is given equal weight relative to man-made solutions brought forward by markets.

11. Such an effort would need to build on the initiatives described above, and to be useful to the development of the post-2020 global biodiversity framework it would need to provide Parties with a vision that helps understand:

- a) what 'transformational change' looks like with regard to resource mobilization;
- b) how targets across the economy and the enabling environment can help spread and reduce resource needs; and
- c) where are the areas of greatest potential to help prioritise actions.

12. Delivering this will require further work in three broad areas:

- a) synthesising knowledge of current resource mobilization efforts;
- b) examining Interactions and the potential to integrate with wider global agendas (biodiversity/climate/SDG finance); and
- c) emerging opportunities, for example associated with the greening of mainstream finance.

¹⁴² See decision XIII/3 on Strategic actions to enhance the implementation of the Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Biodiversity Targets, including with respect to mainstreaming and the integration of biodiversity within and across sectors <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-03-en.pdf>.

¹⁴³ Griscom et al 2017, Natural climate solutions, Proceedings of the National Academy of Sciences <http://www.pnas.org/content/114/44/11645>.

10. Review of previous target setting in the Strategic Plan for Biodiversity 2011-2020

What knowledge is needed?

1. Since their adoption in 2010 as part of the *Strategic Plan for Biodiversity 2011-2020* the 20 Aichi Biodiversity Targets have become broadly accepted as a framework for action to address concerns about biodiversity and ecosystem services. They have led to action at the national level in support of implementing the Convention, and other biodiversity-related conventions have sought to align their activities and strategies at all relevant levels with the Aichi Biodiversity Targets, as have UN bodies and to some extent the private sector.

2. However achievement of the targets is patchy, and while some targets (or parts of targets) are set to be met by 2020, others will not be met. Identifying which target characteristics have been associated with greater success may help in identifying the strengths and weaknesses of the Aichi Biodiversity Targets, and this in turn can inform the development of an effective post-2020 global biodiversity framework, particularly in relation to framing any new potential targets or milestones. In simple terms, we want to learn lessons from recent experience and help frame 'SMARTer' targets and/or milestones post-2020 (while recognizing that no decision has yet been taken on the form of the post-2020 global biodiversity framework).

3. While the primary focus of discussion has often been the Aichi Biodiversity Targets themselves, these targets are embedded within a framework of five goals, which address underlying causes, direct pressures, responses to safeguard biodiversity, enhancing the benefits from biodiversity, and enhancing implementation. The value of such a framework in conveying key messages is important in addition to understanding the effectiveness of the individual targets. Any lessons from use of this framework would also be useful when developing the post-2020 global biodiversity framework, as would lessons from other frameworks such as the 'State-Pressure-Response' framework, or 'Driver-Pressure-State-Impact-Response'.

What are the primary sources of such knowledge?

4. As part of assessing effectiveness of the targets themselves, it is valuable to consider progress in achieving the targets, so as to be able to explore potential relationships between target characteristics and progress in achieving the targets. Such assessments have often focused on progress towards a single target and/or progress within a specific area. A small number of studies have assessed progress towards all targets at a global scale^{144,145,146}. The mid-term assessments¹⁴⁷ by Tittensor et al. (2014) and the 4th edition of the Global Biodiversity Outlook found that while there has been significant progress towards meeting some targets, progress towards most has been insufficient^{144,145}. An updated assessment of progress by IPBES³ is due to be published in 2019 and a final assessment will be published in the fifth edition of the Global Biodiversity Outlook in 2020/2021.

5. The relationship between target wording (semantics) and effectiveness/progress has been assessed in a small number of studies. Butchart et al. (2016) assessed each of the Aichi Biodiversity Target elements in relation to their quantifiability, ambiguity, complexity, and use of redundant

¹⁴⁴ Tittensor, D.P. et al. (2014). A mid-term analysis of progress toward international biodiversity targets. *Science*, 346(6206), pp.241-244.

¹⁴⁵ Secretariat of the Convention on Biological Diversity (2014) *Global Biodiversity Outlook 4*. Montréal, 155 pages.

¹⁴⁶ The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment (in prep).

¹⁴⁷ Tittensor, D.P. et al. (2014). A mid-term analysis of progress toward international biodiversity targets. *Science*, 346(6206), pp.241-244.

terms¹⁴⁸. They found that 14 out of the 20 targets lacked any quantifiable elements (i.e. had no binary or numerical threshold) and only two targets were composed of entirely quantifiable elements. They also identified that most targets have multiple constituent elements, with wording that could be considered unnecessarily complex, one-third have unnecessary redundancies, and many have imprecise or undefined terms. Meanwhile, Di Marco et al. (2016) showed that there is potential for conflict or trade-offs among the targets, in terms of actions and spatial prioritisations, but also at the same time potential for synergies¹⁴⁹.

6. A review of the scientific literature is currently being carried out with the aim of assessing the effectiveness (in terms of strengths and weaknesses) of the targets based on views from peer reviewed scientific publications such as those referred to above¹⁵⁰. This review has shown that while the Aichi Biodiversity Targets are recognised as more holistic, more detailed, SMARTer, and better at addressing drivers than the previous CBD-adopted target and other international targets^{151,152,153,154}, they have also received criticism, particularly in relation to ambiguities, unquantified objectives, and a lack of baselines and indicators^{149,153,155,156,157,158,159,160,161,162,163}. The review has also shown that there is far more published on some targets than others. Further detail from this review will be available by SBSTTA-22 in July.

7. The relationship between the SMARTness of the Aichi Targets (the SMART framework of Specific, Measurable, Ambitious, Realistic, Time-bound and variants thereof) and their success (progress made towards meeting them) are also currently being assessed¹⁵⁰. A questionnaire approach was used to assess the Aichi targets against a set of desirable and expanded 'SMART' characteristics, these characteristics were then related to the reported progress from GBO-4 and the upcoming IPBES assessment of global progress¹⁴⁶. The results of this initial analysis should be published mid-late 2018, and in advance the intention is to have the completed analysis ready for presentation by SBSTTA-22

¹⁴⁸ Butchart, S.H. et al. (2016). Formulating smart commitments on biodiversity: lessons from the Aichi Targets. *Conservation Letters*, 9(6), pp.457-468.

¹⁴⁹ Di Marco, M. et al. (2016). Synergies and trade-offs in achieving global biodiversity targets. *Conservation biology*, 30(1), pp. 189-195.

¹⁵⁰ Green, E.J. et al. (in prep). SMARTer biodiversity targets make more progress.

¹⁵¹ Harrop, S.R. and Pritchard, D.J. (2011). A hard instrument goes soft: The implications of the Convention on Biological Diversity's current trajectory. *Global Environmental Change*, 21(2), pp.474-480.

¹⁵² Collen, B. et al. (2013). *Biodiversity monitoring and conservation: bridging the gap between global commitment and local action*. John Wiley & Sons.

¹⁵³ Mace, G.M. (2013). Science to Policy Linkages for the Post-2010 Biodiversity Targets. *Biodiversity Monitoring and Conservation: Bridging the Gap between Global Commitment and Local Action*, pp.291-310.

¹⁵⁴ Harrop, S. (2014). Holistic and leadership approaches to international regulation: confronting nature conservation and developmental challenges. A reply to Farnese. *Transnational Environmental Law*, 3(2), pp.311-320.

¹⁵⁵ Jørgensen, D. (2013). Ecological restoration in the Convention on Biological Diversity targets. *Biodiversity and conservation*, 22(12), pp.2977-2982.

¹⁵⁶ Harris, L. et al. (2014). Setting conservation targets for sandy beach ecosystems. *Estuarine, Coastal and Shelf Science*, 150, pp.45-57.

¹⁵⁷ Kadoya, T. et al. (2014). Crisis of Japanese vascular flora shown by quantifying extinction risks for 1618 taxa. *PloS one*, 9(6), p.e98954.

¹⁵⁸ Jørgensen, D. (2015). Ecological restoration as objective, target, and tool in international biodiversity policy. *Ecology and Society*, 20(4).

¹⁵⁹ Polak, T. et al. (2015). Efficient expansion of global protected areas requires simultaneous planning for species and ecosystems. *Royal Society open science*, 2(4), p.150107.

¹⁶⁰ Heywood, V.H. (2016). In situ conservation of plant species—an unattainable goal?. *Israel Journal of Plant Sciences*, 63(4), pp.211-231.

¹⁶¹ O'Leary, B.C. et al. (2016). Effective coverage targets for ocean protection. *Conservation Letters*, 9(6), pp.398-404.

¹⁶² Beresford, A.E. et al. (2017). Correlates of long-term land-cover change and protected area performance at priority conservation sites in Africa. *Environmental Conservation*, pp.1-9.

¹⁶³ Dinerstein, E. et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience*, 67(6), pp.534-545.

in July. WWF Germany also has a project under way to review the component parts of the Strategic Plan for Biodiversity 2011-2020, and this is also being reported on during 2018.

8. Targets need to be underpinned by appropriate and similarly SMART indicators as part of the overall framework. A key issue potentially affecting the effectiveness of current targets, has been identified as the availability of indicators and baselines to allow the measurement of progress. Individual indicators vary in quality and are based on data from a wide variety of sources. During their assessment, Tittensor et al. (2014) found four targets had no suitable indicators and the only available indicators for a further two targets were poorly aligned with the targets' elements. This further underlines the key message from evidence stream 17 that it is important to consider baselines and indicators for assessing progress at the same time as developing the post-2020 global biodiversity assessment.

9. At present there is no review of the framework of goals within which the Aichi Biodiversity Targets sit, although this is being considered in the workshops planned by WWF Germany. The 'State-Pressure-Response' framework provides a visually attractive way to present data and provide understanding, and sits well within the adaptive management cycle which is widely used in planning biodiversity conservation and sustainable use activities to improve responses where necessary. However, it does not help understand whether a change in state is directly related to a change in pressure, or a change in the rate of response, which has resulted in some criticism of this overall framework within the framework's five Goals, but has not resulted in other proposals. Meanwhile the framework of goals used in the Strategic Plan for Biodiversity 2011-2020 is both pragmatic and readily communicable.

Are there ways in which delivery and use of the knowledge could be improved?

10. Two pieces of work are currently under way that will be variously reported on at CBD meetings during 2018. The first is led by RSPB and BirdLife International and based on an analysis of published literature and a linked questionnaire approach, which is investigating the efficacy of the Aichi Biodiversity Targets. This is supported financially by the UK Government. The other is a broader review of the *Strategic Plan for Biodiversity 2011-2020* through a workshop approach, carried out by WWF Germany with support from the Government of Germany. The next steps depend to some extent on the form and content of the outputs from these two projects, which are as yet unavailable.

11. If not available in or recommended by these reports, the following may also be helpful when developing the post-2020 global biodiversity framework:

a) Issues to take into account during the formulation of any targets or milestones based on the analysis of the peer reviewed literature and the questionnaire, set out clearly as a set of guidelines to be considered.

b) Ongoing access to the database of peer reviewed literature relating to the Aichi Biodiversity Targets, to facilitate further review and analysis of specific issues where this might be required (for example if setting new targets around relevant issues).

c) Carry out a further questionnaire survey and related analysis (including against GBO-5) under the auspices of the CBD on expert views on the current targets, drawing on the experience described above, so as to get a global representation of analysis, which at present this is not the case.

d) Analysis of whether the structure and framework that the targets exist within is effective, and whether there is an improved alternative framework or formulation of future targets that would improve their effectiveness.

12. Note that in addition it is important to consider lessons learnt in interpreting global targets for use at the national level. This is addressed in the evidence stream on *"lessons learned from interpreting the Aichi Biodiversity Targets at national level"*.

13. Assessments of progress in achieving the Aichi Biodiversity Targets use metrics and indicators. However, the Aichi Targets were devised without sufficient consideration of how they would be measured. This issue is addressed in the evidence stream on *“indicators, and how indicators are used”* in tracking progress.

DRAFT

11. Lessons learnt from interpreting the Aichi Targets at the national level

What knowledge is needed?

1. When the Strategic Plan for 2011-2020 and its global Aichi Biodiversity Targets were adopted in 2010,¹⁶⁴ Parties were expected to use Aichi Targets as a framework for planning and action at the national level, including in their National Biodiversity Strategies and Action Plans (NBSAPs) - the principle instrument for the implementation of the Strategic Plan for Biodiversity 2011-2020 and Aichi Targets at national scale. Aichi Target 17 states that *“by 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan”*.
2. Countries all over the world have finalised or are in the process of finalising their post-2010 NBSAPs, and since COP-10, 153 have submitted their NBSAPs¹⁶⁵. A simplified word search of these post-2010 NBSAPs shows that they reflect varying degrees of alignment with the Strategic Plan for 2011-2020, with some countries adopting the global Aichi Targets wholesale and some partially. This is supported by observations from the NBSAP Forum host agencies¹⁶⁶ who provided technical support and learning to countries during the NBSAP revision process. One hundred and forty of these Parties have prepared and submitted post-2010 NBSAP that takes the Strategic Plan for Biodiversity 2011-2020 into account¹⁶⁷.
3. For the purpose of informing the post-2020 global biodiversity framework it is valuable to understand how well the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets influenced national plans and targets, and as part of this to also understand any difficulties that Parties encountered in interpreting the global targets for use at the national level. Key questions might include: to what extent did Parties integrated Aichi Targets into their NBSAPs; what helped or hindered the interpretation Aichi Targets at national level; what were the challenges and successes in interpreting the Aichi Targets at national level; did the NBSAP preparation process influence how countries interpreted the Aichi Targets at national level; are there regional patterns emerging in the way the Aichi Targets were interpreted at national level, and also the challenges and successes experienced; which Aichi targets where easy/difficult to interpret and why; what are the best practices in interpreting Aichi Targets that can inform the post-2020 global biodiversity framework; was the language used in the Aichi Targets simple and succinct to allow easy interpretation at national level and assessment of progress; and did revised NBSAPs take into account the potential synergies and trade-offs among targets? Another important consideration may be the extent to which background documents, guidance and other forms of support provided useful in supporting interpretation of Aichi Targets at national level.

What are the primary sources of such knowledge?

4. The main sources of knowledge on how Aichi Targets where interpreted at the national level include a) post-2010 NBSAPs, b) national reports to the CBD and in particular, fifth national reports submitted to the CBD, c) the fourth edition of the Global Biodiversity Outlook report¹⁶⁸, d) a scientific paper by Tittensor, D.P. et al. (2014) on the mid-term analysis of progress toward international

¹⁶⁴ [COP 10 Decision X/2.](#)

¹⁶⁵ <https://www.cbd.int/nbsap/>.

¹⁶⁶ UNDP, UN Environment, through its World Conservation Monitoring Centre (UNEP-WCMC), and the Secretariat to the Convention on Biological Diversity (SCBD)

¹⁶⁷ <https://www.cbd.int/nbsap/>.

¹⁶⁸ Secretariat of the Convention on Biological Diversity (2014) Global Biodiversity Outlook 4. Convention on Biological Diversity, Montreal. Available at: <https://www.cbd.int/gbo4/>.

biodiversity¹⁶⁹ and d) lessons from global initiatives such as the NBSAP Forum¹⁷⁰ and the GEF-funded “Global NBSAP Support” project that supported 130 plus countries who accessed GEF Biodiversity Enabling Activities to update NBSAPs to incorporate the Aichi Targets. Further experience will also come from the NBSAP Forum’s ongoing work on supporting sixth national reports and implementation of revised NBSAP.

5. Other sources of knowledge include scientific reports underpinning the fourth edition of the Global Biodiversity Outlook report¹⁷¹; regional reports (Africa¹⁷², Asia and the Pacific¹⁷³, Latin America and the Caribbean¹⁷⁴, and West Asia¹⁷⁵) on the State of Biodiversity which served as a mid-term review of progress towards the Strategic Plan and the Aichi Targets and scientific literature (Butchart et al (2016)¹⁷⁶.

6. The CBD Secretariat and the NBSAP Forum have provided support to many countries to develop NBSAPs that incorporate the Aichi Targets and fulfilling other related obligations before the CBD, and through this experience, these organisations have learned how countries have interpreted the Aichi Targets at the national level. Further, some studies of a limited number of post-2010 NBSAPs were carried out in 2016 by NGOs (Birdlife International, Conservation International, The RSPB, The Nature Conservancy and WWF)¹⁷⁷ focussing on alignment of national targets to Aichi Targets and progress of national targets towards the Aichi Targets¹⁷⁸ and by UN Environment¹⁷⁹ and International Development Law Organization¹⁸⁰ on the coverage of specific thematic areas such as legal preparedness and biodiversity mainstreaming.

7. In addition, a wide range of new lessons learnt will become available in the near future, including from post-2010 NBSAPs yet to be submitted to the CBD, sixth national reports¹⁸¹ due to be submitted to the CBD by December 2018, the fifth edition of the Global Biodiversity Outlook and

¹⁶⁹ Tittensor, D.P et al. (2014) A mid-term analysis of progress toward international biodiversity. Science 346, 241. DOI: 10.1126/science.1257484.

¹⁷⁰ NBSAP Forum: <http://nbsapforum.net/#>.

¹⁷¹ Secretariat of the Convention on Biological Diversity (2014) Global Biodiversity Outlook 4. Convention on Biological Diversity, Montreal. Available at: <https://www.cbd.int/gbo4/>.

¹⁷² UNEP-WCMC (2016) The State of Biodiversity in Africa: A mid-term review of progress towards the Aichi Biodiversity Targets. UNEP-WCMC, Cambridge, UK. https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/819/original/2503_Biodiversity_Review_AFRICA_Artwork.pdf.

¹⁷³ UNEP-WCMC (2016) The State of Biodiversity in Asia and the Pacific: A mid-term review of progress towards the Aichi Biodiversity Targets. UNEP-WCMC, Cambridge, UK: https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/820/original/2503_Biodiversity_Review_ASIA_PACIFIC_Artwork.pdf.

¹⁷⁴ UNEP-WCMC (2016) The State of Biodiversity in Latin America and the Caribbean: A mid-term review of progress towards the Aichi Biodiversity Targets. UNEP-WCMC, Cambridge, UK: https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/821/original/2503_Biodiversity_Review_LAC_Artwork.pdf.

¹⁷⁵ UNEP-WCMC (2016) The State of Biodiversity in West Asia: A mid-term review of progress towards the Aichi Biodiversity Targets. UNEP-WCMC, Cambridge, UK: https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/732/original/Biodiversity_Review_WEST_ASIA.pdf.

¹⁷⁶ Butchart, S.H. et al. (2016) Formulating Smart Commitments on Biodiversity: Lessons from the Aichi Targets. Conservation Letters, November/December 2016, 9(6), 457–468. <http://onlinelibrary.wiley.com/doi/10.1111/conl.12278/pdf>.

¹⁷⁷ Birdlife International, Conservation International, RSPB, The Nature Conservancy and WWF (2016) Convention on biological diversity Progress Report towards The Aichi Biodiversity Targets National commitments fall short of action needed to safeguard nature. <https://www.cbd.int/financial/doc/global-2016-targetsreport.pdf>.

¹⁷⁸ Birdlife International, Conservation International, RSPB, The Nature Conservancy and WWF (2016) Convention on biological diversity Progress Report towards The Aichi Biodiversity Targets National commitments fall short of action needed to safeguard nature. <https://www.cbd.int/financial/doc/global-2016-targetsreport.pdf>.

¹⁷⁹ Pisupati, B. & Prip, C. (2015) Interim Assessment of Revised National Biodiversity Strategies and Action Plans (NBSAPs) UNEPWCMC, Cambridge, UK and Fridtjof Nansen institute, Lysaker, Norway: <https://www.cbd.int/doc/nbsap/Interim-Assessment-of-NBSAPs.pdf>.

¹⁸⁰ Prip, C (2016) Review of Post-2010 National Biodiversity Strategies and Action Plan: Legal Preparedness for Biodiversity Mainstreaming. IDLO Report, 2016, 25 p. <https://www.fni.no/publications/review-of-post-2010-national-biodiversity-strategies-and-action-plan-legal-preparedness-for-biodiversity-mainstreaming-article1322-290.html>.

¹⁸¹ [COP 13 Decision XIII/27](#).

various thematic, regional and global assessments being conducted by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services¹⁸² and scientific literature will provide evidence on how Aichi Targets were interpreted at national level. Lessons will also become available at SBSTTA-22 and COP-14 discussion on the post-2020 global biodiversity framework.

8. Valuable knowledge therefore exists and is in preparation, but it is important to note that this evidence is scattered and not synthesised in one place where it can be easily accessible to inform post-2020 global biodiversity framework.

Are there ways in which delivery and use of the knowledge could be improved?

9. Further work is needed if existing lessons learned in interpreting Aichi Targets and implementing them at national level are to inform a post-2020 global biodiversity framework that is as effective as possible in promoting and facilitating action at the national level. In particular it would be helpful to *call for preparation of an information document for Parties on lessons learned from national experience in taking the Aichi goals and targets and addressing them within the national context when developing NBSAPs*. This would be very valuable in helping to ensure a future framework that is as effective as possible in promoting and facilitating action at the national level. The document could be based on experiences from the NBSAP Forum, and potentially updated as further information becomes available.

¹⁸² The overall scope of the regional assessments is to assess the status and trends regarding biodiversity, ecosystem functions and ecosystem services and their interlinkages, the impact of biodiversity, ecosystem functions and ecosystem services and threats to them on good quality of life, and the effectiveness of responses, including the Strategic Plan for Biodiversity 2011–2020 and its Aichi Biodiversity Targets, the Sustainable Development Goals, and the National Biodiversity Strategies and Action Plans developed under the Convention on Biological Diversity.

12. Effectiveness of Targets in Driving Change

What knowledge is needed?

1. Evidence of how other sectors and processes have developed and used targets to drive change will help both to define the process of formulating the post-2020 global biodiversity framework, and to devise robust monitoring and evaluation so that the CBD Secretariat and Parties can assess the extent to which the targets are being met.
2. Evidence relating to the Aichi Biodiversity Targets is covered in Discussion Note 10.

What are the primary sources of such knowledge?

3. Evidence on the efficacy of targets to drive change in an international context is sparse, particularly within the peer reviewed literature. Much of what is published focuses on the outcome, rather than on the impact that the target has had on the outcome. However, the papers that do exist offer relevant insights. For example the Millennium Development Goals (MDGs) and their associated targets and indicators have been hailed as a remarkable success in driving change at the national level, and in the final report the UN Secretary General said that the *“global mobilization behind the Millennium Development Goals has produced the most successful anti-poverty movement in history”*.¹⁸³ Although there are some who question the extent to which the change can be attributed to the MDGs themselves,¹⁸⁴ it is clear that the internationally adopted goals provided an impetus for change, and a framework for action and reporting. It probably helped that in a number of areas the MDGs themselves reinforced and built on commitments that had already been made, and on actions that were already underway.
4. There is a significant literature on the concept of “SMART” targets, although the actual word assigned to each of the letters varies, the most commonly used being: *Specific, Measurable, Achievable, Relevant* and *Time-bound*. The concept was originally introduced as a means of improving management through setting SMART objectives for organizations and their component parts.¹⁸⁵ In other words they were a practical approach to increasing success.
5. Formalised targets that begin to show SMART aspects began to emerge in the late 1960s,¹⁸⁶ and by the 1980s targets were increasingly being used in the management of public services. SMART Targets are now used in a multitude of sectors, including road safety and health where they appear to have driven demonstrable change.^{187,188,189} In a review of targets commissioned by the European Union with respect to road safety, a number of characteristics of targets were identified as contributing to their success,¹⁹⁰ including the following:

¹⁸³ United Nations, 2015. The Millennium Development Goals Report.

[http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20\(July%201\).pdf](http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf)

¹⁸⁴ Green, D., Hale, S. and Lockwood, M., 2012. Oxfam Discussion Paper: How can a post-2015 agreement drive real change? <http://www.oxfamblogs.org/fp2p/wp-content/uploads/dp-politics-post-2015-mdgs-29102012-en.pdf>

¹⁸⁵ Doran, G. T. (1981). "There's a S.M.A.R.T. way to write management's goals and objectives". *Management Review*. AMA FORUM. 70 (11): 35–36

¹⁸⁶ Locke, E. A., (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance*, Vol. 3, Pages 157-189. DOI: [https://doi.org/10.1016/0030-5073\(68\)90004-4](https://doi.org/10.1016/0030-5073(68)90004-4)

¹⁸⁷ Blunt I., 2015. 'Fact or Fiction? Targets improve quality in the NHS?'. Nuffield Trust comment, 13 February 2015. <https://www.nuffieldtrust.org.uk/news-item/fact-or-fiction-targets-improve-quality-in-the-nhs>

¹⁸⁸ Wong, S.C., Sze, N.N., Yip, H.F., Loo, Becky P.Y.; Hung, W.T., Lo, H.K., 2006. Association between setting quantified road safety targets and road fatality reduction. *Accident Analysis and Prevention*, 38, 997-1005.

¹⁸⁹ Thorlby, R. and Maybin, J., 2010. A high-performing NHS? A review of progress 1997–2010. <https://www.kingsfund.org.uk/sites/default/files/High-Performing-NHS-progress-review-1997-2010-Ruth-Thorlby-Jo-Maybin-Kings-Fund-April-2010.pdf>

¹⁹⁰ See https://ec.europa.eu/transport/road_safety/specialist/knowledge/qrst/why_set_targets/do_targets_work_en

a) *Political will and stakeholder motivation*: Targets can help keep issues on the political agenda, and at the same time can be a basis for motivating all stakeholders and offering them something tangible to support and engage with.

b) *Management and accountability*: Effective use of targets can result in clear lines of accountability and responsibility. Good practice is considered to be a nested hierarchy of intermediate and final outcome targets, and institutional output targets.¹⁹¹

c) *Effective programmes*: Targets require realistic implementation plans with an appropriate programme of interventions. Evidence indicates that quantitative targets, with associated indicators to monitor progress, can result in more effective implementation and better use of scarce resources.^{192,193}

6. Reviews of targets in other sectors have also indicated the following additional considerations with respect to setting and achieving targets: ^{194,195,196,197,198,199}

a) *Improved performance*: There are clear examples of an association between appropriately ambitious targets and better performance.

b) *Monitoring*: Whilst targets set out the intended end point, indicators are critical for assessing the direction and distance of travel and often should be identified before the target is set. Monitoring is the process to gather the data required to assess the change in the indicator over time – for example individual protected area creation data for each year, allowing the measurement of an indicator on the cumulative growth of protected areas over time. Gathering data for indicators of success in targets can help to catalyse efforts, implement successful interventions, track performance and improve accountability.

c) *Compliance*: Where there are expectations of compliance and sanctions for failure, this can also lead to enhanced performance, although this of course is dependent on the governance processes in place.

7. The 2°C target with respect to climate change – the envisaged maximum mean temperature increase above pre-industrial levels – that governments agreed under the UN Framework Convention on Climate Change (UNFCCC) helped to pull together countries' efforts to avoid the dangerous impacts of climate change.²⁰⁰ As such, it arguably is one of the most prominent targets in global environmental governance, and reinforced in the Paris Agreement. However, the target, which is science-based, took

¹⁹¹ Bliss, A. and Breen, J. M. World Bank, 2009. Implementing the Recommendations of the World Report on Road Traffic Injury Prevention: Institutional Management Functions

¹⁹² Hagerman, S. M. and Pelai, R., 2016. "As Far as Possible and as Appropriate": Implementing the Aichi Biodiversity Targets. Conservation Letters, 9(6), 469–478. DOI: 10.1111/conl.12290

¹⁹³ Wong, S.C., Sze, N.N., Yip, H.F., Loo, Becky P.Y.; Hung, W.T., Lo, H.K., 2006. Association between setting quantified road safety targets and road fatality reduction. Accident Analysis and Prevention, 38, 997-1005.

¹⁹⁴ Locke, E. A., Latham, G. P., 2002. Building a practically useful theory of goal setting and task motivation. A 35-year Odyssey. American Psychologist, 57, 705-717

¹⁹⁵ United Nations, 2015. The Millennium Development Goals Report.

[http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20\(July%201\).pdf](http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf)

¹⁹⁶ Barrett, S., 2008. Climate treaties and the imperative of enforcement. Oxford Review of Economic Policy, Volume 24, Number 2, 239–258.

¹⁹⁷ O'Brian, E. and Gowan, R., 2012. What Makes International Agreements Work: Defining Factors for Success. New York University, Centre on International Cooperation.

¹⁹⁸ Burns, H. (2017) Targets and Indicators in Health and Social Care in Scotland. Scottish Government. Available at: <http://www.gov.scot/Resource/0052/00527689.pdf>

¹⁹⁹ See <http://www.lse.ac.uk/researchAndExpertise/researchImpact/caseStudies/bevan-targets-sanctions-improving-public-services.aspx>

²⁰⁰ Morseletto, P., Biermann, F. and Pattberg, P., 2017. Governing by targets: reductio ad unum and evolution of the two-degree climate target. International Environmental Agreements 17:655–676. DOI 10.1007/s10784-016-9336-7

significant time to achieve broad acceptance, and even now it is not really made clear who is responsible for doing what in order to achieve it.

8. Under the UNFCCC Paris Agreement a new approach is being taken to addressing the 2°C target. Prior to the 2015 Paris Conference of the Parties, every state was requested to submit their own climate targets known as 'Intended Nationally Determined Contributions' (INDCs). The Paris Agreement's success is in part due to the integral role of the INDCs, which are 'anchored into' the Agreement. However the extent to which all of these pledges will be delivered is still unclear, and there remains a need to increase ambition in these national targets if the overall objective is to be met.^{201,202}

Are there ways in which delivery and use of the knowledge could be improved?

9. Carry out *further review of the efficacy of targets, particularly in areas which have seen major transformative change*, with the aim of identifying key lessons learnt that could be used in development of the post-2020 global biodiversity framework. This would complement lessons learnt from using the Aichi Biodiversity Targets.

10. Carry out *further review of the approach of seeking 'nationally determined contributions'* to assess whether this might be an option for developing further within the context of the post-2020 global biodiversity framework, as either a formal or informal part of the process. This might also include lessons learnt with respect to identifying national priority actions concerning implementation of Aichi Biodiversity Target 11.²⁰³

²⁰¹ UNEP (2016). The Emissions Gap Report 2016. United Nations Environment Programme (UNEP), Nairobi

²⁰² Tobina, P., Schmidt, N.M., Tosun, J., and Burns, C. (2018) Mapping states' Paris climate pledges: Analysing targets and groups at COP 21. Global Environmental Change. Volume 48, January 2018, Pages 11-21. Available at: <https://doi.org/10.1016/j.gloenvcha.2017.11.002>

²⁰³ CBD Information document UNEP/CBD/COP/13/INF/17 Protected Areas: Facilitating the achievement of Aichi Biodiversity Target 11

13. Uptake of global or regional targets in national planning, businesses, etc.

What knowledge is needed?

1. One of the key weaknesses of the current Strategic Plan for Biodiversity 2011-2020 and its global Aichi Biodiversity Targets is that its development and subsequent implementation at national level is in most cases the responsibility of Environment Ministries and Agencies with limited, and in most cases, no substantive involvement of important non-environment ministries and sectors such as Foreign Affairs, Finance and Planning, Agriculture, Local Government, Mining, Energy and Businesses. As a result mainstreaming of biodiversity and ecosystem services into other sectors becomes an essential task to be undertaken rather than an automatic process.
2. In order to avoid this in the future, it is imperative that any targets or milestones included in the post-2020 global biodiversity framework have traction beyond ministries of environment, so that a wide range of other ministries, agencies and sectors also take responsibility for their achievement. For this to happen, it is important that those developing and negotiating the post-2020 global biodiversity framework have some understanding of what drives broader uptake of targets across sectors and actors (including businesses).
3. However there are also cases where the Aichi Biodiversity Targets have been taken up by other stakeholders, including those in other sectors, and it would therefore also be valuable to review more broadly how the global targets including Aichi Biodiversity Targets have been used by different stakeholders, in order to inform development of the post-2020 global biodiversity framework. Experience with uptake of the Aichi Biodiversity Targets within NBSAPs is treated as a separate issue, and is addressed in other evidence briefings (*Discussion Note 11*).

What are the primary sources of such knowledge?

4. The Sustainable Development Goals (SDGs) have traction across sectors and actors including as governments, business, civil society and citizens²⁰⁴. The SDGs resulted from a process that has been more inclusive than ever, with Governments involving business, civil society and citizens from the outset. The 17 SDGs are designed to be universal and therefore apply to all countries – poor, rich and middle-income alike – and to all segments of society. Although each focuses on a different topic area, the SDGs are meant to be integrated, indivisible and collectively support a development agenda balancing the economic, social and environmental dimensions of sustainability.²⁰⁵
5. Reviews have been undertaken on the relationship between the SDGs and the Aichi Biodiversity Targets,²⁰⁶ recognising that biodiversity and ecosystem services are essential for delivery of many SDGs and their underlying targets, and that the SDGs are a catalyst to drive multi-stakeholder action on biodiversity and to integrate international biodiversity goals into business strategies and operations. It would be valuable to build on this experience when developing the post-2020 global biodiversity framework, and to increase the links between the biodiversity and development agendas.

²⁰⁴ Jan Bebbington, Jeffrey Unerman, (2018) "Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research", *Accounting, Auditing & Accountability Journal*, Vol. 31 Issue: 1, pp.2-24.

²⁰⁵ The SDGs were shaped following the largest consultation programme in the United Nations' history. Mandated by the United Nations, an open working group of representatives from 70 countries drafted the goals, drawing on a series of "global conversations". These included 11 thematic and 83 national consultations, door-to-door and online surveys, and enabled more than 5.7 million people from low- and medium- HDI (human development indicator) countries to participate.

²⁰⁶ Existing evidence includes: CBD/SBSTTA/21/2/Add.1, UNEP/CBD/COP/13/10/Add.1, UNEP/CBD/SBSTTA/19/INF/9, and Shultz et al 2017 ("The 2030 Agenda and ecosystems – a discussion paper on the links between the Aichi Biodiversity Targets and the Sustainable Development Goals". SwedBio at Stockholm Resilience Centre.)

6. Governments and other stakeholders, including in the private sector are also increasingly recognising the importance of other globally adopted agendas. Although the primary focus of these agendas is not biodiversity and ecosystem services, they are nonetheless very relevant. The Paris Agreement on Climate Change notes the importance of ensuring the integrity of ecosystems to address climate change, and promotes ecosystem-based climate adaptation.²⁰⁷ The Sendai framework for Disaster Risk Reduction calls for the adoption of ecosystem approaches, to make communities more resilient to disasters through the sustainable use and management of ecosystems.²⁰⁸ The UN Convention to Combat Desertification Land Degradation Neutrality Strategy emphasises the importance of counterbalancing the expected loss of productive land with the recovery of degraded areas.²⁰⁹ The UN Strategic Plan for Forests 2017-2030 also provides a global framework for actions at all levels to sustainably manage all types of forests and trees outside forests and halt deforestation and forest degradation.²¹⁰

7. Linking the post-2020 framework with the Sustainable Development Goals, climate targets under the Paris Agreement and the Sendai Framework will provide a significant turning point for sustainable development, biodiversity, climate and disaster risk reduction agendas. In addition, most of these agendas are being translated into national and subnational plans. This creates an unprecedented opportunity to pursue implementation of these agendas in a way that can generate significant mutual benefits and move beyond the view that these agendas are somehow distinct or different avenues to achieving the transformational goals they share.

8. Much has been written on mainstreaming and 'reciprocal mainstreaming' as approaches to integrating biodiversity and ecosystem services into other sectors through developing a shared understanding of needs, values and objectives²¹¹. The mainstreaming agenda is very much concerned with coherent implementation and reinforcement of actions and commitments of the different international commitments mentioned above, and therefore provides opportunities to address sustainable development goals, biodiversity, and climate and disaster risk reduction agendas in a coherent manner and involving different sectors and actors. This would be significantly facilitated if the post-2020 framework is already being aligned with other international commitments as it is developed. This creates a significant opportunity to pursue implementation of these agendas in a way that can generate significant mutual benefits and move beyond the view that these agendas are somehow distinct or different avenues to achieving the transformational goals they share.

Are there ways in which delivery and use of the knowledge could be improved?

9. *Analysis of the actual and potential relationships between different intergovernmental agendas*, so that this can be taken into account when developing the post-2020 global biodiversity framework. This would consider, in particular, the SDGs and their associated targets, the Sendai Framework, the Paris Agreement, the UN Convention to Combat Desertification Land Degradation Neutrality Strategy and the UN Strategic Plan for Forests 2017-2030.

10. *Review of the ways in which the Aichi Biodiversity Targets have been used by different stakeholders and different sectors* at all levels, in order to inform development of the post-2020 framework for biodiversity. Understanding why the targets had traction in different circumstances and with different stakeholders will assist in the understanding of what works and what does not.

11. Consider whether it would be valuable to *develop guidelines for use at the national level on the relationships between different intergovernmental agendas*, and how this might be addressed at the

²⁰⁷ http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

²⁰⁸ https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf.

²⁰⁹ <https://www2.unccd.int/actions/achieving-land-degradation-neutrality>.

²¹⁰ http://www.un.org/esa/forests/wp-content/uploads/2016/12/UNSPF_AdvUnedited.pdf.

²¹¹ <https://www.cbd.int/doc/training/nbsap/b3-train-mainstream-en.pdf> and <http://pubs.iied.org/pdfs/17608IIED.pdf>.

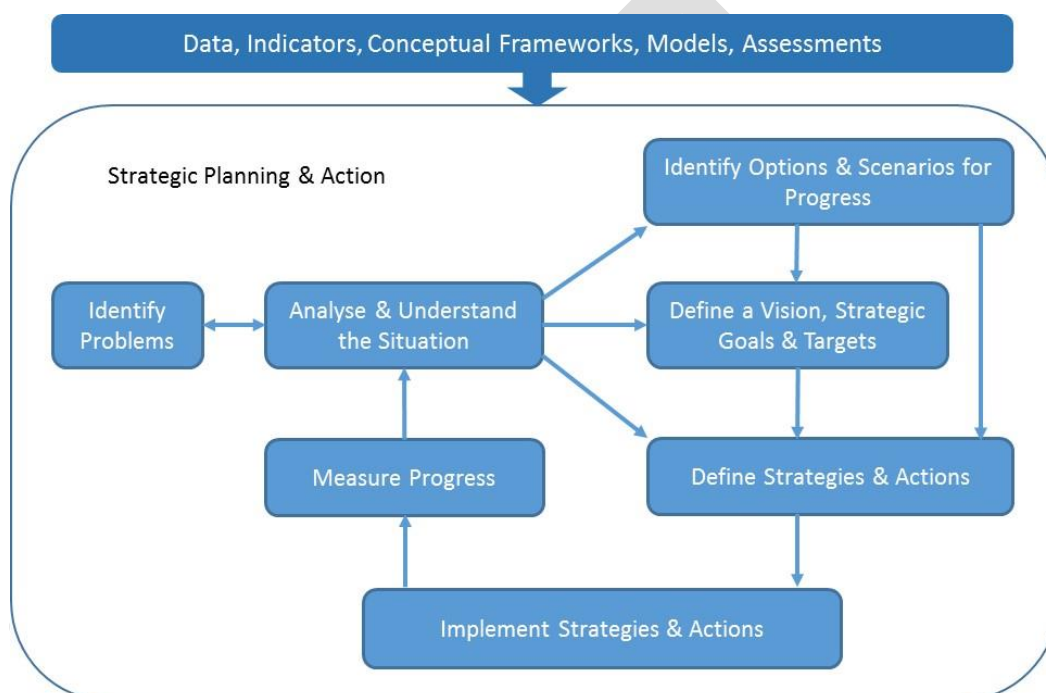
national level. This would address the same international agendas as identified above, and could be brought out at the same time as the post-2020 global biodiversity framework is agreed.

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14. Considering indicators when developing the post-2020 global biodiversity framework

What knowledge is needed?

1. *Indicators and strategic planning.* The process for developing and implementing the post-2020 global biodiversity framework has not yet been defined, but it is likely to involve in some form the main steps identified in the figure below, and all of these have needs for information. This information can be produced and used in the form of data, of indicators derived from data, and in models and assessments that use indicators as tools in their analyses and communication products. Addressed here is the type of knowledge needed to have and use indicators as part of defining the post-2020 global biodiversity framework, and then the knowledge needed for choosing indicators to subsequently measure progress in implementation.



2. *Indicators to analyse and understand the situation; identify problems; identify options and scenarios for progress.* The subjects and issues addressed by the post-2020 global biodiversity framework are likely to include those in the current Strategic Plan for Biodiversity 2011-2020 and there may well be additional ones. The identification and analysis of these subjects will involve the use of assessments which rely on indicators (such as the IPBES²¹² assessments). A major influence on which issues are identified is the conceptual frameworks that are used to frame the descriptions of the current situation and how it is analysed. The post-2020 global biodiversity framework is likely to be designed to support the 2030 Agenda for Sustainable Development²¹³, and the subjects and targets of the Sustainable Development Goals (SDGs) could conceivably form a kind of conceptual framework for it. The specific knowledge needs for indicators to support the design of the post-2020 global biodiversity framework can only be defined after determining the conceptual framework, key questions and issues that it will cover, and from this the types of analyses to be developed.

3. *Indicators and targets.* The vision and Strategic Goals of a Strategic Plan for Biodiversity 2011-2020 are usually for very broad subjects and it is not meaningful to identify progress indicators at this level, but targets should be specific and measurable and have progress indicators. It is not yet

²¹² <https://www.ipbes.net/>

²¹³ <https://sustainabledevelopment.un.org/post2015/transformingourworld>

known whether the post-2020 global biodiversity framework will include targets, but if it does, as targets are defined, the development of indicators for reporting starts by assessing the suitability of existing indicators against criteria, such as the scientific validity of the production methods, the ease of understanding the indicator by its users, and the institutional capacity and sustainability for its production. For targets without sufficient existing indicators it may be possible to adapt or rework some existing indicators or datasets. Where no suitable indicators exist it may well be possible to develop new ones. Ideally the process of indicator selection should start in conjunction with the target development process, so as to support the definition of target wording that aids their measurement at global and national scales. To foster synergies in implementation, special attention should be given to indicators used or being considered in related intergovernmental processes such as other biodiversity-related conventions than the CBD.

4. *Indicators to measure progress.* The post-2020 global biodiversity framework will in many ways build on the Strategic Plan for Biodiversity 2011-2020 and so this requires measuring and learning from progress towards the Aichi Biodiversity Targets. CBD Decision XIII/28²¹⁴ welcomed an updated list of indicators for the Aichi Biodiversity Targets. Knowledge is needed on how comprehensive and suitable these indicators are for measuring progress towards each of the targets, and whether the data and institutional capacity exists for the indicators to be produced.

What are the primary sources of such knowledge?

5. *Use of indicators to assess progress.* At the global scale the first assessment of progress towards the Aichi Biodiversity Targets was presented in 2014 in the Global Biodiversity Outlook 4²¹⁵ (GBO-4) report, and will be repeated with the publication of GBO-5 in June 2020. A key source for GBO-5 will be the sixth national reports to the CBD which are due in December 2018, and these are recommended to include indicators of progress to national targets and their contribution to the Aichi Biodiversity Targets.

6. *Reviews of potential indicators and related considerations.* 2011²¹⁶ and 2015²¹⁸ meeting documents of the Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020²¹⁹ include a number of relevant documents, including one on key global gaps and indicator options for future assessment of the Strategic Plan as well as a review of national approaches to assessing progress.

7. *Access to indicator information and expertise.* The website of the Biodiversity Indicators Partnership (BIP)²²⁰ provides information on over fifty indicators produced by the partners of the BIP, including how they relate to the Aichi Biodiversity Targets and SDGs²²¹. The Resources section of the website includes a number of relevant reports²²².

²¹⁴ <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>

²¹⁵ <https://www.cbd.int/gbo4/>

²¹⁶ 2011 meeting documents of the expert group include “National Indicators, Monitoring and Reporting for Global Biodiversity Targets”.

²¹⁷ <https://www.cbd.int/meetings/AHTEG-SP-IND-01>

²¹⁸ 2015 meeting documents include: “Review of the Global Indicator Suite, Key Global Gaps and Indicator Options for Future Assessment of the Strategic Plan for Biodiversity 2011-2020”, “Review of National Approaches to Assessing Progress Towards the Aichi Biodiversity Targets”, and “The Use of Indicators to Assess Progress Towards the Attainment of the Aichi Biodiversity Targets in the Fifth National Reports to the Convention on Biological Diversity”.

²¹⁹ <https://www.cbd.int/meetings/ID-AHTEG-2015-01>

²²⁰ www.bipindicators.net

²²¹ <https://www.bipindicators.net/crossmapping>

²²² Reports: “Biodiversity Indicators and the 2010 Biodiversity Target: Outputs, experiences and lessons learnt from the 2010 Biodiversity Indicators Partnership” (<https://www.bipindicators.net/resources/global-publications/biodiversity-indicators-and-the-2010-biodiversity-target-outputs-experiences-and-lessons-learnt-from-the-2010-biodiversity-indicators-partnership>), CBD Technical Series 78: Progress Towards the Aichi Biodiversity Targets: An assessment of biodiversity trends, policy scenarios and key actions (<https://www.bipindicators.net/resources/global-publications/cbd-technical-series-78-progress-towards-the-aichi-biodiversity-targets-an-assessment-of-biodiversity>).

Are there ways in which delivery and use of the knowledge could be improved?

8. The BIP has been promoting the development and use of global and national biodiversity indicators since 2007. This *experience and lessons learned in support of two successive strategic plans developed and adopted under the auspices of the CBD could usefully be captured and communicated* in an information document to inform the process for developing the post-2020 global biodiversity framework, and hopefully made available for COP-14. This could include examples of successful BIP-supported indicator development for the Aichi Biodiversity Targets. It could also include suggestions on ways that the global indicator and biodiversity data communities could input to the preparation of the post-2020 global biodiversity framework so that indicators are ready for implementation as soon as the framework is adopted. Further, in order to enhance synergies in the development and use of biodiversity indicators, this could include further developing *a mapping of BIP indicators currently used to measure progress in achieving the Aichi Biodiversity Targets, the Sustainable Development Goals²²³ and biodiversity-related conventions targets and goals, as well as identifying suitable indicators to measure progress under the different processes in the future.*
9. It would be valuable to have an *analysis of the institutional landscape and resources required for producing the current indicators used for global reporting on the Aichi Biodiversity Targets*, to assist in identifying the capacity and support needed for post-2020 indicator production.
10. Several of the Aichi Biodiversity Targets had significant gaps in the availability of global indicators when the Strategic Plan for Biodiversity 2011-2020 was first adopted, and some gaps remain. It would be beneficial to *develop a brief assessment of the likely reasons for these past indicator gaps*, and make recommendations based on this for consideration both in target or milestone setting (if this is used) and in preparing to support implementation. This could include both the state of existing knowledge for the target subjects, and the measurability of the targets.
11. The potential for new indicators and analyses in support of the post-2020 global biodiversity framework is being transformed by the creation of ‘big data’ and remote sensing technology. This includes opportunities for understanding biodiversity issues, supporting decision-making, and public awareness raising. An *assessment of the potential of these ‘big data’ and remote sensing developments for indicators and analyses* for each of the topics covered by the current Aichi Biodiversity Targets might be useful in supporting development of the post-2020 global biodiversity framework.

[trends-policy-scenarios-and-key-actions](https://www.bipindicators.net/resources?filters%5Bcategory%5D=47)), Guidance documents on Developing Biodiversity Indicators for National Use (<https://www.bipindicators.net/resources?filters%5Bcategory%5D=47>).

²²³ <https://www.bipindicators.net/crossmapping>

15. Lessons that assess how indicators can be used to influence change

What knowledge is needed?

1. The evidence described in Annex 14 is concerned with considering the development and use of indicators at the same time as developing the post-2020 global biodiversity framework, so that: (a) previous use of indicators with respect to the Strategic Plan for Biodiversity 2011-2020 can help inform development of the framework; and (b) so indicators are defined and ready for use insofar as is possible as soon as the post-2020 global biodiversity framework is agreed. This section is concerned instead with evidence of how – with advance planning now – indicators can be used in order to have a greater effect on implementation of the post-2020 global biodiversity framework.
2. In order to achieve more effective use of indicators during implementation of the post-2020 global biodiversity framework, it will also be important to understand and respond to issues such as:
 - a. How indicators can be used to imply and lead towards a specific desired pathway or outcome
 - b. How biodiversity-related indicators can become more embedded in national processes, so that they are a fundamental part of reporting processes; and
 - c. How indicators can be more effectively used in communicating progress or lack of it so as to help influence action for change.

What are the primary sources of such knowledge?

3. *Indicators that imply and lead towards a specific desired pathway or outcome.* There is clear evidence that within Aichi Biodiversity Target 11, the quantitative protected area coverage targets combined with the relevant indicator (% of land or sea in protected areas) led to efforts at the national level to increase protected area coverage.^{224,225} From outside the biodiversity sector, another such measurable target and associated indicator which has promoted change is the agreement to set 0.7% of gross national income as a target for overseas development assistance.²²⁶ Similarly, some economic indicators such as Gross National Product and Gross Domestic Product have had significant impact on management of national economies since the 1940s, as the subject which is measured has become associated with a desired outcome and with the implication that bigger is better.²²⁷
4. *Embedding biodiversity-relevant indicators in national statistics.* Where indicators are embedded in national statistics, and compiled as a matter of course by national statistics offices and the like, there is greater potential for these statistics to influence national action. This happened to some extent with the Millennium Development Goals (which largely drew on existing national indicators), and will hopefully also happen with the indicators being developed and adopted for the Sustainable Development Goals and their associated targets. The role of national statistics offices in developing indicators to monitor implementation of policy frameworks varies depending on the national structures and approach adopted by the government systems as a whole. The Sustainable Development Goals (SDGs) provide a framework for both biodiversity-relevant and wider environment and development indicators to be brought together and monitored in a consistent way.
5. *Coherent use of indicators across international conventions and processes.* Where the same indicators are used by multiple conventions and processes there is increased potential for them to be recognised and used to inform decisions. In the forest sector, an Organisation-Led Initiative of the

²²⁴ UNEP-WCMC and IUCN (2016). Protected Planet Report 2016. UNEP-WCMC and IUCN: Cambridge UK and Gland, Switzerland.

²²⁵ See <https://www.cbd.int/nbsap/targets/?aichi=11>.

²²⁶ See <http://www.oecd.org/dac/stats/the07odagnitarget-ahistory.htm>.

²²⁷ Lepenies, Philipp (April 2016). *The Power of a Single Number: A Political History of GDP*. Columbia University Press. ISBN 9780231541435.

Collaborative Partnership on Forests has been developing a global core set of forest-related indicators.²²⁸ It is well understood that a consistent set of indicators helps to: inform policy makers across sectors, present a clear and consistent story, promote synergies and better coordination between agencies and hence reduce the reporting burden. Different sets of biodiversity-related indicators are currently used across international conventions and global assessment processes, including the CBD list of indicators for the Strategic Plan for Biodiversity 2011-2020,²²⁹ the SDG indicator list,²³⁰ and core and highlighted lists of indicators for the IPBES assessments.²³¹ The Biodiversity Indicators Partnership is working to increase consistency and coherence across these lists.²³²

6. *Communications and messaging using indicators that argues for change and promotes implementation.* If effectively done this can raise expectation of the indicator being made available periodically, and used in campaigns. If part of the process of developing the post-2020 global biodiversity framework includes developing a communications and outreach plan to build support with stakeholders, then knowledge and lessons could be identified from examples of successful indicators used by NGOs and other lobbying groups in the biodiversity sphere and other sectors. Two examples of existing indicators developed for awareness-raising and lobbying for change under the Aichi Biodiversity Targets are the Ecological Footprint²³³ by the Global Footprint Network, and the Red List Index²³⁴ by IUCN and other Red List Partnership members. Successful indicators in this regard tend to ones with strong 'storylines'.

7. *Scalable indicators.* There are few examples of approaches which use the same indicators and/or metrics at both regional and national levels, so that the data compiled for national indicators is then used at the regional level for regional indicators. The Streamlining European Biodiversity Indicators (SEBI) initiative was set up to develop a set of European biodiversity indicators building on existing national and regional monitoring processes and linked to the CBD global framework 2011-2010. The existence of a consistent regional set of indicators supported their use in a variety of ways, including in the European Environment Agency core set of indicators and the assessment of progress in implementing the European Biodiversity Action Plan.²³⁵

Are there ways in which delivery and use of the knowledge could be improved?

8. Discussion Note 14 has already indicated the need to consider the identification and/or development of indicators alongside development of the post-2020 global biodiversity framework itself. The lessons discussed here suggest the need to consider as part of this exercise the extent to which the indicator clearly *leads towards a desired outcome*, the extent to which it *tells a story that can be easily communicated*, and whether it is *scalable*.

9. In order to provide a resource for those developing indicators for the post-2020 global biodiversity framework, it will also be valuable to fully *understand the ways in which indicators are being used in other biodiversity-relevant conventions and processes* so as to be able to increase work towards more

²²⁸ See <http://www.cpfweb.org/45387-094b703e8607f5cf1d3d410a6c67d9686.pdf>.

²²⁹ CBD COP Decision XIII/28 - <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>.

²³⁰ At its forty-seventh session, the United Nations Statistical Commission agreed, as a practical starting point, on a proposed global indicator framework for the goals and targets of the 2030 Agenda for Sustainable Development, subject to future technical refinement (see E/2016/24-E/CN.3/2016/34, chap. I, sect. B, decision 47/101).

²³¹ Information document IPBES/5/INF/5 (<https://www.ipbes.net/system/tdf/downloads/pdf/ipbes-5-inf-5.pdf?file=1&type=node&id=540>).

²³² <https://www.bipindicators.net/>.

²³³ <https://www.bipindicators.net/indicators/ecological-footprint>.

²³⁴ <https://www.bipindicators.net/indicators/red-list-index>.

²³⁵ EEA (2012) Streamlining European biodiversity indicators 2020: Building a future on lessons learnt from the SEBI 2010 process. EEA Technical Report No 11. Copenhagen. Downloaded from <https://biodiversity.europa.eu/topics/sebi-indicators>.

consistent use of biodiversity-related indicators. This includes consideration of the ways in which biodiversity-indicators are used at the national level to report to intergovernmental processes.

10. Effective use of indicators also requires effective communication and outreach programmes. *Consideration needs to be given to communications and outreach plans as the post-2020 global biodiversity framework is developed* so as to achieve maximum impact both from the adoption of the framework and subsequent tracking of implementation.

11. Considering each of the issues discussed in the previous section, it may also be valuable to *explore the potential for developing guidance on the effective use of indicators at the national level* in order to support Parties in further refinement of their own indicators programmes, and to build alignment with the post-2020 global biodiversity framework. In addition to drawing on the new framework and any new indicators associated with it, it would also draw on existing national experience in embedding biodiversity indicators in national statistics, using scalable indicators, and building communications and messaging using indicators.

16. Reports on implementation and how reporting systems can drive higher performance

What knowledge is needed and why?

1. It is important to consider reporting and review processes as the post-2020 global biodiversity framework is developed, so that there is an understanding of how to evaluate progress and to improve performance once the new framework is adopted. There are three key area that might be considered.
2. *National reports to the CBD:* Under Article 26 of the Convention, national reporting is a core requirement for CBD Parties, providing an essential source of information for assessing progress in implementing the convention. The 6th National Report is due by the end of 2018, and the guidance provided to Parties is that this report should be about progress in delivering the Aichi Biodiversity Targets and the national interpretation of them.²³⁶ It is assumed that the 7th National Report will be organized around the post-2020 global biodiversity framework. If the format and guidance for the 7th National Report is developed alongside or closely after adoption of the post-2020 global biodiversity framework this will allow Parties to prepare themselves for reporting, and organize information systems that support both implementation and reporting.
3. *Review processes and approaches:* Under Article 6 of the Convention, Parties are expected to develop or adapt national strategies, plans or programmes to implement the Convention, and when the *Strategic Plan for Biodiversity 2011-2020* was adopted in 2010, Parties were urged both to develop national and regional targets “using the ... Aichi Targets as a flexible framework” and to review and revise their National Biodiversity Strategies and Action Plans (NBSAPs).²³⁷ These targets, strategies and plans are essential elements in managing implementation at the national level, and since CBD COP 10 there have been increasing efforts to peer review NBSAPs so that they can be improved, and to review them so as to understand the extent to which national actions will deliver the global targets. If these processes of review are considered while the post-2020 global biodiversity framework is being developed, then there may be potential for developing a more robust review process (or processes) once the post-2020 global biodiversity framework is agreed.
4. *Consistency across intergovernmental conventions and processes:* As was achieved with the *Strategic Plan for Biodiversity 2011-2020*, it is expected that the post-2020 global biodiversity framework will be relevant across the global biodiversity-related conventions and processes,^{238,239} and the decision on national reporting taken at CBD COP 13²⁴⁰ already calls on the CBD Secretariat to explore options for enhancing synergy on national reporting amongst relevant conventions with respect to indicators, common themes, sharing of data and information, and reporting tools. These are issues that need to be considered as the post-2020 global biodiversity framework is developed.
5. Indicators are addressed separately in Discussion Notes 14 and 15.

What are the primary sources of such knowledge?

6. There have been five reporting rounds under the CBD, and the sixth national reports are due to be submitted by the end of 2018. All reports are available online, as are the various guidance documents (formats have changed over time).²⁴¹ Various syntheses of national reports have been produced,²⁴² and national reports have been drawn on when drafting successive editions of the Global

²³⁶ See <https://www.cbd.int/nr6> for guidelines and resource manual for the CBD 6th National Report

²³⁷ CBD COP Decision X/2 <https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-02-en.pdf>

²³⁸ CBD COP Decision XIII/3 <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-01-en.pdf>

²³⁹ CBD COP Decision XIII/24 <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-24-en.pdf>.

²⁴⁰ CBD COP Decision XIII/27 <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-27-en.pdf>.

²⁴¹ See <https://www.cbd.int/reports>

²⁴² See <https://www.cbd.int/reports/syntheses.shtml>

Biodiversity Outlook²⁴³ and progress reports for COP and the subsidiary bodies. Experience with reporting in one round has been used to inform subsequent reporting.²⁴⁴

7. Although not national reports in the strict sense, NBSAPs are a major source of information on the strategies and actions proposed by Parties, and these are also all available online,²⁴⁵ and in addition many Parties have national Clearing House Mechanism websites where their activities are promoted.²⁴⁶ The links between these different elements of national implementation (NBSAPs, national CHM, national reports) vary between one Party and another, and are not made particularly clear although there are increasing opportunities to share experience amongst national focal points and other practitioners.²⁴⁷

8. Recognising the importance promoting ambition at the national level, and supporting implementation, the Convention has been considering options for review of NBSAPs at recent meetings, including voluntary peer review.^{248,249} This work is continuing with voluntary testing of approaches.²⁵⁰ In addition, the NBSAP Forum developed a peer review framework for use at country level to provide some direct support to countries, which might also be useful in this regard.^{251,252,253} The peer review mechanism of NBSAPs offered through the NBSAP Forum helped countries to align their national targets with global targets; and contributed to strengthening national implementation.

9. The CBD has also been carrying out periodic analysis of NBSAPs and national reports to the convention to try to gain an understanding of the extent to which national actions will deliver the global targets.^{254,255} This has been used to inform the COP and subsidiary bodies on progress towards the Aichi Biodiversity Targets, and as an opportunity to try to identified priorities for action, and to encourage greater ambition. Some of these analyses have also been included in the fourth edition of the Global Biodiversity Outlook,²⁵⁶ and in regional biodiversity outlooks²⁵⁷ in order to further promote the message.

10. Parties requested the CBD Secretariat, in collaboration with the secretariats of the biodiversity-related conventions and Rio conventions, and UNEP-WCMC, to explore options for enhancing synergy on national reporting among these conventions, including by considering common reporting modules on shared issues.²⁵⁸ The objective of modular reporting is to avoid having to reproduce the same

²⁴³ See for example <https://www.cbd.int/gbo4/>

²⁴⁴ See for example CBD document UNEP/CBD/SBI/1/11 <https://www.cbd.int/doc/meetings/sbi/sbi-01/official/sbi-01-11-en.pdf>

²⁴⁵ See <https://www.cbd.int/nbsap/>

²⁴⁶ See <https://www.cbd.int/chm/network/>

²⁴⁷ See for example wcmc.io/sourcebook-web

²⁴⁸ CBD Document UNEP/CBD/COP/13/19 Voluntary peer-review process for NBSAPs: Progress report and updated methodology <https://www.cbd.int/doc/meetings/cop/cop-13/official/cop-13-19-en.pdf>

²⁴⁹ CBD document UNEP/CBD/SBI/1/10/Add.3 Further options for mechanisms to support review of implementation. <https://www.cbd.int/doc/meetings/sbi/sbi-01/official/sbi-01-10-add3-en.pdf>

²⁵⁰ CBD COP Decision XIII/25 Modus operandi of SBI and mechanisms to support review of implementation. <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-25-en.pdf>

²⁵¹ See <http://nbsapforum.net/peer-review>

²⁵² Pisupati, B. & Prip, C. (2015) Interim Assessment of Revised National Biodiversity Strategies and Action Plans (NBSAPs) UNEPWCMC, Cambridge, UK and Fridtjof Nansen institute, Lysaker, Norway: <https://www.cbd.int/doc/nbsap/Interim-Assessment-of-NBSAPs.pdf>.

²⁵³ <https://www.cbd.int/doc/decisions/cop-11/cop-11-dec-02-en.pdf>.

²⁵⁴ CBD Document UNEP/CBD/COP/13/8/Rev.1 Updated report on progress in the implementation of the Convention And the Strategic Plan for Biodiversity 2011-2020 and towards achievement of the Aichi Biodiversity Targets <https://www.cbd.int/doc/meetings/cop/cop-13/official/cop-13-08-rev1-en.pdf>

²⁵⁵ CBD document UNEP/CBD/COP/13/8/Add.2/Rev.1 Updated analysis of the contribution of targets established by Parties and progress towards the Aichi Biodiversity Targets <https://www.cbd.int/doc/meetings/cop/cop-13/official/cop-13-08-add2-rev1-en.pdf>

²⁵⁶ See <https://www.cbd.int/gbo4/>

²⁵⁷ See <http://wcmc.io/State-of-Biodiversity-Africa>, <http://wcmc.io/State-of-Biodiversity-AsiaPacific>, <http://wcmc.io/State-of-Biodiversity-LatinAmericaAndCaribbean>, <http://wcmc.io/State-of-Biodiversity-WestAsia>

²⁵⁸ CBD COP Decision XIII/27 <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-27-en.pdf>

information in several reports and thus avoid duplication of work and instead facilitate information management and make more efficient use of resources. In addition, highlighting the interlinkages between different processes can help foster coherence and synergies at all relevant levels, as has been shown by review of the different convention reporting processes and formats.²⁵⁹ The guidelines and resource manual for the 6th national report provided some assistance in this regard by identifying reports and information sources from other intergovernmental convention and processes that might be relevant.²⁶⁰

11. Also valuable in this regard have been analyses and guidance carried out on the relationships between the objectives and interests of the other biodiversity-related conventions and the Aichi Biodiversity Targets.^{261,262,263} By identifying decisions and other documents across conventions that provide guidance on implementation and reporting related to each of the Aichi Biodiversity Targets, this can both support coherent implementation and related information management at the national level, and potentially inform the development of a reporting framework with other biodiversity-related conventions to improve access to relevant data and information for the implementation. This provides an example of how the *Strategic Plan for Biodiversity 2011-2020* has in part been seen as a framework for multiple interests.

12. Increasing efforts are being made by secretariats to move towards online reporting tools, because of the benefits that this brings for improving the capture and management of information. However this also brings additional opportunities for increasingly applying standards, for prefilling reports with information that is already available, and for sharing information more widely (for example with other conventions). Online reporting also provides opportunities for more effectively linking reports to national information systems, and for updating information on a regular basis rather just as national reports are due. Well-designed reporting formats further facilitate this process.

13. Examples of other experiences of reporting mechanisms that it may be relevant to explore further in the context of further development of review and reporting processes under the CBD include the following, some of which have already been considered during the CBD consideration of review options:²⁶⁴

- a) the REDD + Monitoring and Measurement, Reporting and Verification process;²⁶⁵
- b) forest-related reporting as addressed by the Collaborative Partnership on Forests;²⁶⁶
- c) experience of human rights reporting;²⁶⁷
- d) links to OECD environmental performance review;²⁶⁸ and
- e) national biodiversity audits.²⁶⁹

²⁵⁹ FOEN, UNEP-WCMC, NatureConsult (2016). Elements for a modular reporting against the Aichi Biodiversity Targets. UNEP-WCMC, Cambridge.

²⁶⁰ See <https://www.cbd.int/nr6> for guidelines and resource manual for the CBD 6th National Report

²⁶¹ <https://www.cbd.int/doc/meetings/biodiv/brcws-2016-01/other/brcws-2016-01-unep-wcmc-en.pdf>.

²⁶² See guidance developed by biodiversity-related conventions on <https://www.cbd.int/nbsap/guidance-tools/guidelines.shtml>

²⁶³ UNEP (2016) Enhancing cooperation among the seven biodiversity related agreements and conventions at the national level using national biodiversity strategies and action plans. United Nations Environment Programme (UNEP), Nairobi, Kenya

²⁶⁴ CBD document UNEP/CBD/SBI/1/10/Add.3 Further options for mechanisms to support review of implementation. <https://www.cbd.int/doc/meetings/sbi/sbi-01/official/sbi-01-10-add3-en.pdf>

²⁶⁵ <https://theredddesk.org/theme/mrv/>.

²⁶⁶ <http://www.cpfweb.org/73035/en/>.

²⁶⁷ National Mechanisms for Reporting and Follow-up. A Practical Guide to effective state engagement with international human rights mechanism. Online available: http://www.ohchr.org/Documents/Publications/HR_PUB_16_1_NMRF_PracticalGuide.pdf.

²⁶⁸ See <http://www.oecd.org/env/country-reviews/about-env-country-reviews.htm>

²⁶⁹ See for example <http://www.intosai.org/about-us.html>

14. In addition a number of national-level projects have sought to review experience with reporting with the aim of making reporting more effective. Examples included a GEF-funding project which looked at national reporting to the three Rio Conventions amongst Least Developed Countries and Small Islands Developing States,²⁷⁰ and the German-funded project that has supported development of biodiversity information management and reporting guidelines for south east Europe.²⁷¹

Are there ways in which delivery and use of the knowledge could be improved?

15. Following completion of the 6th national reports, it would be helpful to *carry out a review of reporting under the convention in order to learn lessons* that cover not only the process of reporting itself, but also the value of and ways in which the reported information is used. This would provide a basis for developing future reporting, and preferably defining process and content as soon after the post-2020 framework is agreed as is practicable so as to facilitate future reporting effort.

16. In order to fully explore options for enhancing synergy on national reporting among the biodiversity-related conventions,²⁷² it will be important to *review the relationships between elements of the post-2020 global biodiversity framework and the objectives and activities of other conventions*. This will allow planning for reporting processes that meet multiple objectives, while recognising that full implementation may need to take place in a step-wise manner.

17. As part of the above, it will be helpful to *review the future potential for online reporting*, both as a means for streamlining reporting processes, and as a driver and opportunity for further alignment of information management and reporting across conventions. This will *inter alia* draw on the experience of online reporting for the first time under the CBD.

18. When rolling out the post-2020 global biodiversity framework it would be effective to at the same time provide *guidance on associated biodiversity information management and reporting for delivering the post-2020 global biodiversity framework*. Consideration should be given to the preparation of guidelines that support parties, and provide access to the necessary tools, databases and experience, including in use of spatial data and indicators.

19. It is understood that the further testing and development of a methodology for voluntary peer review will continue, subject to that availability of resources,²⁷³ and hopefully this will prompt more peer review in the future. This could be combined with *further consideration of potential options for review of implementation* that could be explored alongside development of the post-2020 global biodiversity framework, building on work already done.²⁷⁴ Rolling out options for review at the same time as adopting the new framework may be effective.

²⁷⁰ Mohammadi Fazel, A., Gibson, J., Harrison, J., Herkenrath, P. and Kelly, J. A process for identifying national solutions to challenges faced in developing countries in reporting to environmental conventions: insight from the Facilitating National Reporting to the Rio Conventions (FNR_Rio) Project. Int. J. Environ. Res., 9(4):1163-1172, Autumn 2015.

²⁷¹ See <https://balkangreenenergynews.com/second-publication-bimr-regional-guidelines-now-available/>

²⁷² CBD COP Decision XIII/27 <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-27-en.pdf>.

²⁷³ CBD COP Decision XIII/25 Modus operandi of SBI and mechanisms to support review of implementation. <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-25-en.pdf>

²⁷⁴ CBD document UNEP/CBD/SBI/1/10/Add.3 Further options for mechanisms to support review of implementation. <https://www.cbd.int/doc/meetings/sbi/sbi-01/official/sbi-01-10-add3-en.pdf>