



Report from the 4th Science Forum

Towards living in harmony with nature by 2050

A Science-Policy Dialogue

Executive summary

This science-policy dialogue engaged participants representing science, policy and civil society to discuss how science can foster implementation of biodiversity policy up to 2020 and inform the post-2020 global biodiversity framework. Discussions focused on the following key questions:

What is necessary to achieve the 2050 vision for biodiversity? What are the options and how can we re-inforce and accelerate action? How to operationalize transitions and transformational changes needed for halting biodiversity loss and ensuring long-term human wellbeing? How to open new pathways to design nature-based solutions for nature and people? And how to engage wider parts of the society?

These questions stimulated discussions across the various sessions during the Forum, which provided input for formulating key messages in the following topic areas:

- (1) Engaging with society;
- (2) Disentangling the 2050 vision;
- (3) Actions to achieve the 2050 vision;
- (4) Priority areas for target settings;
- (5) The potential role of Nature-Based solutions;
- (6) Ecosystem degradation and restoration;
- (7) Transitions and transformational changes;
- (8) The knowledge base for baseline setting and monitoring;
- (9) Calls for research priorities.

Scientists introduced each of the eight sessions with an inspirational speech, followed by a moderated panel discussing key questions and interacting with the audience. Three regional break-out working group sessions focused first on the 2050 vision, then suggested actions to reach the vision, and finally targets to foster actions, all through the use of a back-casting exercise.

This document explains how these key messages were synthesized from discussions during the two days of the science-policy dialogue. It contains further information on setup, guiding questions, methodology, agenda and documents referred to during preparation of and in presentations.

Photo credits page header: © Chinnapong, Fotolia, 2018



Key messages from the Science Forum¹

The following key messages were submitted to the plenary of CBD COP-14 on 26/11/18²:

1. On engaging with society:

- Robust science is one of the drivers that influence policy making. Developing policies based on the best scientific knowledge available is a complex process with many interactions. However, science-based solutions are a hope to change things for better. It is important to have scientific presence in policy fora, with a strong interaction through science-policy-society interfaces.
- Biodiversity as term remains difficult for parts of the public and policymakers, and science should help in remediating this. Boundaries created by the different “languages” spoken can be overtaken by using the language of the audience addressed. Effective communication is key!
- We need to transform the way we produce and transfer knowledge. Outreach to the broader public, the business sector and all relevant stakeholders, is the precondition to making people aware and to engage them in transformative changes for biodiversity.
- We need to invest in understanding on how requested changes can be translated into governance and changing mind-sets at all levels. The way how local governments implement legislation directly effects public opinion. It is equally important that people assume responsibility of their daily activities that can influence change.

2. On disentangling the 2050 vision:

- The 2050 vision is multidimensional across scales and across sectors, with three possible approaches: nature for nature, nature for society (natural capital) and nature as culture, the latter which is close to “living in harmony with nature”.
- We need to ‘bend the curve’ of biodiversity decline. Therefore, we need positive visions to mobilize short-term action and long-term enhanced national ambition and to ensure that we reach a wider audience. Positive nature futures through participatory scenarios can help developing such positive interpretations of the 2050 vision.
- Various regional interpretations of the 2050 vision emerged in discussions. They mirror a variety of approaches, with varying priority setting on poverty alleviation, nature for nature, awareness raising, enhancing social responsibility, limiting damage, strengthening national capacities and trans-disciplinarity (mainstreaming).

3. On actions to achieve the 2050 vision

- Main principles for actions emerged in discussions. The following set of statements is not representative for all group discussions but gives indications on main issues discussed:
 - Reduce inequalities and ensure equal and sustainable access to environmental resources.
 - Embed environmental awareness and understanding at all levels of education.

¹ The key messages presented here were submitted after the closure of the 4th Science forum to the CBD secretariat. For reasons of consistency, this section remains unchanged, regardless of revision proposals received during the review of this report.

² As short summary statement (see Annex 3), and to be transformed into document CBD/COP/14/INF/xx.



- Enable access to and connection of all people with nature.
- Implement multi-stakeholder public awareness strategies and capacity building efforts.
- Develop a “green”, sustainable economy.
- Reduce consumption and invest in recognizing and adopting alternative systems of consumption and production that are respectful for biodiversity.
- Intensify work on science-policy interfaces, for more effective biodiversity policies.
- Connect discussions on biodiversity and climate and underline their interconnections in policy, scientific and society domains.
- Develop greener cities and implement urban nature based solutions.
- Ensure wide coverage of biodiversity data with open access for use in science and policy.

4. On priority areas for target settings

- Developing scenarios can help in identifying possible multiple pathways, exploring synergies and trade-offs with other domains. They inform targets for 2030 and 2040 towards the 2050 vision.
- Setting targets is a social and political undertaking, but science can and should inform these decisions. Social sciences should be integrated in this transdisciplinary effort, to identify what is necessary to move towards a world of better biodiversity to support a better life of people.
- Diverging views emerged on which path to follow: Should we focus on preventing extinctions, reversing decline and retain intactness according to urgency criteria, building on existing efforts to achieve a minimum safeguarding area for biodiversity? Or should we prioritise the need for massive transformational changes in societal behaviour to address the main drivers for biodiversity loss, which are outside the mandate of biodiversity policy settings, and which are often coming from different places than where the impacts are felt?
- Targets need to be more quantitative to ensure they are effective. Targets need to be responsive to geographical locations and the variety of distributions of biodiversity elements. There is need for few basic targets, with wide applicability, and the development of sub-targets, in different operational and geographical levels, to assist implementation.

5. On the potential role of Nature-Based Solutions (NBS)

- NBS, ecosystem-based approaches, green and natural infrastructure are terms coined in different contexts, but share the same rationale: working with nature for people with people.
- NBS comply and fit well with the CBD agenda and objectives, bring prosperity, and are inclusive. Implementing NBS leads to mainstreaming biodiversity in other sectors. They support good governance by involving different actors and institutions, requiring responsibility to each of them.
- Introduction of NBS into any action setting for the post-2020 framework will provide solutions to allow nature and its benefits to take the lead in delivering transformational change for improved biodiversity, human health and livelihoods at a time where urgent action is required.
- The overwhelming scientific evidence provided during 2018 assessments and reports (IPBES, IPCC, UNESCO, WWF etc.) requests urgent action for implementing NBS to deliver systemic approaches across the Sustainable Development Goals, and for linking the three Rio Conventions.



6. On ecosystem degradation and restoration:

- Science supports the need to implement the African summit declaration to fight degradation and strategic guidance for African priorities in future work programmes. Africa's biodiversity priorities within the pan-African action agenda on ecosystem restoration are linked to all three Conventions.
- The list of priorities for restoration which will only be successful if they are integrated into economic sectors and complemented by means of implementation (including research), stakeholder engagement, implementation arrangements, monitoring and evaluation. Integrated sectoral planning is required to achieve key targets and milestones.
- It is very important to define a baseline, prepare monitoring and provide reliable data for successful restoration. This must be integral part of all restoration activities.
- We need to understand the interaction between land degradation and economic migration.

7. On transitions and transformational changes:

- We need to understand the drivers of change to define transformations. Understanding the relationship between global actions which improve conditions for nature and local action is critical in understanding transformations and transitions to inform the global vision.
- We need a transformation of mind sets. It is a challenge to develop policies that operate across sectors to reduce the negative influence of different decisions which may be taken by different sectors operating in isolation. We need policy which encourages sectors to work together for transition and transformational changes.
- Innovation, both social and technological, is key to achieve transformations from global to local level. It is critical for translating science into policy, and to implement mainstreaming.

8. On the knowledge base for baseline setting and monitoring:

- We need to ensure that scientific data and results are publicly available, in a form useable by policy makers, other researchers and society. This must include local and traditional knowledge, which can inform solutions for biodiversity conservation, sustainable use and recovery of ecosystems. Information availability is key to managing uncertainty.
- We need to monitor progress at multiple scales. There is a need for intermediary milestones to ensure effective tracking and assessments of the impact of the proposed changes.

9. On calls for research priorities:

- More transdisciplinary research is needed to identify and fill the gaps in understanding governance for transformational change. There is a need for research informing policies on how to develop effective legislation for conserving biodiversity. We need to evaluate progress on addressing the previously identified knowledge gaps.
- We need to understand trade-offs between development and conservation and to identify thresholds for sectors to stay within sustainable use of biodiversity, including relevant indicators.



The 4th Science Forum was held on 23-24 November 2018 in Sharm el-Sheikh, Egypt, at CBD COP-14. 165 participants representing science, policy and civil society registered. The Forum was organized by the [International Union of Biological Sciences](#), the [European Commission](#), with support from [EKLIPSE](#), the EU science-policy interface mechanism on biodiversity and ecosystem services, the [Inter-American Institute for Global Change Research](#), and the [Secretariat of the Convention on Biological Diversity](#).

Contents

Executive summary	1
Key messages from the Science Forum	2
Set up of the forum	6
Main points presented and discussed at the Science Forum	9
Conclusions of the process	17
Next steps	18
Annex 1: Information on methodology of the backcasting participatory process	19
Annex 2: Backcasting process: Visions collected	22
Annex 3: Statement provided by the organisers to plenary	29
Annex 4: Suggested References	30
Annex 5: Participants Agenda	33
Annex 6: Short Agenda (updated)	41



Set up of the forum

Parties of the CBD call for the post-2020 biodiversity policy framework to be informed by science. In policy making, scientific evidence is but one element among many other competing, and often better financed, elements. The social or political challenges for which contributions from science are most needed are often the ones where science is most complex, interdisciplinary and lacking clear-cut answers. This is the environment scientists, policy makers and stakeholders must navigate to make efforts to reach feasible and viable actions so that policies benefit from the support of the best scientific evidence available, including knowledge from indigenous peoples and local communities. Whilst scientific knowledge is usually produced testing theories and hypothesis, to be communicated to peers afterwards, this Forum enabled a dialogue of scientists with policy makers at an early stage of the post-2020 process.

The set-up of the 4th Science-Policy forum provided an interactive platform for the participants to think innovatively, share knowledge and experiences and showcase successful practices and approaches, as well as lessons learned in an inclusive participatory approach with divergent perspectives. The forum was developed around eight thematic sessions, discussing key aspects of humanity's perspective to live in harmony with nature by 2050 and it was organised in a manner which allowed participants to listen to inspirational key note speakers and panel discussions between scientists, policy-makers and representatives of civil society, as well to develop discussions in small break-out groups. The overall set-up of the forum is briefly described below. Participants received in advance a detailed agenda, including the key questions to be discussed and background information on themes and methods used in the forum to include the knowledge of participants (e.g. back-casting exercises (Annex 1)).

The COP President, Dr. Yasmine Fouad, encouraged in her welcome address a dialogue between policy and science, and called for mainstreaming global with national policies on biodiversity and the integration of science with policy making. She stressed the need to involve the youth. She welcomed work in the forum as a model for policy and science to work together.

Messages from the Summit of Local and Subnational Governments, the Nature and Culture Summit, the Global Taxonomy Initiative Forum and the Sustainable Ocean Day emphasized the need to work collaboratively to achieve biodiversity, climate objectives and the sustainable development goals.

Session 1 dealt with **Concepts of transition** we need to achieve in our way to living in harmony with biodiversity. The aim of the session was to set the ground for broader understanding of transitions and the need for social-ecological transformations, as well as the roles that science and policy should assume during this process. The session supported a panel-audience discussion format.

Session 2 opened a discussion around the **Current and future state of biodiversity** aiming to identify what is our starting point, in terms of the current biodiversity challenges, what is our future aim and how can we promote the role of integrated assessments and scenarios/models for policy making in the post-2020 process and towards reaching the 2050 biodiversity vision. The keynote speeches and related discussions aimed to give input to sessions 3 and 4.

Session 3 focused on **Untangling the 2050 vision for biodiversity**. Starting from the CBD 2050 vision for biodiversity, how can we translate it into tangible terms regarding science, policy and society in regional and global levels? And after "painting the picture" of the future vision, what are the short and long-term actions that we need to undertake to reach it? A keynote speech on the subject provided



an introduction for a thinking exercise, where the participants reflected on their views regarding the 2050 biodiversity vision and the necessary actions to reach it.

On Session 4, the discussions focused the appropriate **Target setting for the post-2020 agenda** and the necessary process of translating the necessary actions to reach the 2050 biodiversity vision into target areas for the post-2020 framework: How can science help to make progress in the quantification and attribution/ allocation of the targets? How can measurable indicators and actions assist us in assessing progress towards these targets (and the 2050 vision)? Two keynote presentations and a short panel discussion provided the base for another breakout group session where participants had the opportunity to discuss the target setting process and bring forward proposals for new/refined targets.

The second day of the forum began with Session 5 on the use of **Nature based solutions for restoration and beyond**. During this session, the discussions focused on the needs for research and policy setting on restoration to be taken further for providing multiple benefits beyond climate change mitigation, adaptation and biodiversity conservation and restoration. Can such Nature-Based Solutions help work across, and to achieve all the Sustainable Development Goals? Which challenges, opportunities and unresolved issues exist? The session supported a panel-audience discussion format.

Session 6 discussions focused on **Increasing resilient solutions for restoration**. The session was informed from the results of the African Summit and aimed to better frame the need for restoration and use of Nature-Based Solutions, including in urban settings, to reach biodiversity targets, on the example of Africa. A panel-audience discussion was again developed in this session.

Session 7, **Uptake of actions towards the 2050 vision**, focused on understanding the frame in which the targets are set in the post-2020 agenda to prepare for the development of the post-2020 global biodiversity targets. The participants, building on the results of the back-casting exercise of day 1 (sessions 3 and 4), worked towards refining the actions identified as important across the working groups.

Finally, Session 8 brought back the discussion on issues of transformation by **Engaging Society, Science and Policy in transformative change**. The session focused on the needs from science in implementing social-ecological transitions as well as in engaging various stakeholders. What are priorities for research and policy to advance transitions regarding social-ecological systems, biodiversity and benefits from nature? The session supported a panel-audience discussion and concluded the main part of the forum.

In a wrap-up and concluding session, main points of discussion during both days were summarized and presented to participants, for any additional input for final refinement and structuring of these conclusions. Participants were asked to give their opinion on the development and outputs of the forum, and on the overall setting of the meeting and the potential for the development of future similar discussions. Based on these discussions, the organisers prepared nine key messages from the Science Forum to the CBD COP plenary.

The first key message, calling on biodiversity-related science and policy making to more intensively engage with society, was issued in almost all sessions of the Forum, particularly in session 8. Three further key messages focussed on how to interpret the 2050 vision, actions to achieve it, and setting priority areas for targets (sessions 3, 4, and 7). Two sets of key messages sketched the role of Nature-



Based Solutions and of restoration in the post-2020 framework (sessions 5 and 6). Key messages on transitions and transformational changes were presented and discussed in sessions 1 and 8. Delivering the knowledge base for baseline setting and monitoring was covered in session 2, whilst key messages on research priorities were derived from discussions in various sessions.

No	Key messages	Related session
1	On engaging with society	Session 8
2	On disentangling the 2050 vision	Session 3
3	On actions to achieve the 2050 vision	Sessions 4 and 7
4	On priority areas for target settings	Session 4
5	On the potential role of Nature-Based Solutions	Session 5
6	On ecosystem degradation and restoration	Session 6
7	On transitions and transformational changes	Sessions 1 and 8
8	On the knowledge base for baseline setting and monitoring	Session 2
9	On calls for research priorities	Sessions 1, 2, 6

Sessions 1, 2, 5, 6 and 8 followed a more classic speakers-panellists-audience moderated discussion, while sessions 3, 4 and 7 formed a participatory exercise, where the basics of back-casting thinking were introduced. More information on the way that the back-casting exercise was developed and implemented can be found in Annex 2 of this document, whilst more information on speakers and panellists of the 4th Science-Policy forum can be found in Annex 6.



Main points presented and discussed at the Science Forum

Session 1: Concepts of transition

Transitions are defined as long-term processes of disruptive and non-linear systemic change in complex societal systems, such as economic sectors or regions. Transitions may imply break-down and destabilization of the regime while, at the same time, future pathways and outcomes are still unclear, and thus they often involve a high degree of uncertainty. Therefore, it is important to focus on desired transitions towards the 2050 biodiversity vision. Collective actions and policy decisions during the coming years will largely influence the future outcomes of emerging transitions. Within the broader global transition, there is a biodiversity transition taking place in the way biodiversity conservation and sustainable use is understood, organized and implemented. There is a need to better define the guiding mission of this transition, as well as to identify pathways to institutionalize practices, culture, and structures that support a sustainable economy. This session aimed to set the ground for a broader understanding of transitions and the need for social-ecological transformations for biodiversity conservation and sustainable use.

Three key elements emerged through the inputs from the speakers and panellists, as well as from the discussions with the audience:

It is important to understand the global, regional and local drivers of change to define transformations. *Understanding the relationship between global and local actions*, which improve conditions for nature, is critical in understanding transformations and transitions **to inform the global vision**.

The *first transformation* which is necessary to achieve this is of *mind-sets*. It is a challenge to develop **cross-sectoral** policies to reduce the negative influence of different decisions which may be taken by different sectors operating in isolation. Any efforts in this domain should aim for the **creation of transdisciplinary policy** which encourages sectors to work together for transition and transformational changes.

Innovation, both social and technological, is key to achieve transformations from global to local level. It is critical for translating science into policy, to create new pathways towards the 2050 biodiversity vision and to implement mainstreaming in multiple sectors of human activity.

Additional points which were raised during the session included: a) the understanding that achieving common transitions requires the robust development of and consensus on the main elements of our common vision, as well as the identification of alternative pathways to achieve it; b) the key role of science in explaining and enabling transformation, as well as assisting change, also by transformation of the way scientific knowledge is produced and transferred; c) the importance of outreach, publicity and communication in order to raise awareness and engage society in the upcoming transitions and transformations. To that account, caution must be placed in the impediments which are sometimes created by the use of specialised language and complicated terminology.



Session 2: From the current to the future status of biodiversity

There is no doubt that systemic change is necessary to improve the current state of biodiversity and people's interactions with it. Ecological and resilience research shows that current processes in climate and ecosystems might lead to an acceleration of environmental disruption in the next decades, with irreversible change that could lead to catastrophic consequences for life on Earth. Unmitigated economic and societal pressure on the environment makes such tipping points more likely to occur. The embedded nature of currently dominant and unsustainable cultures, structures and practices makes biodiversity conservation challenging. Remediating or softening their negative impacts is not sufficient to reduce the long-term and fundamental risks these impacts pose to societies, let alone improving the state of the environment or creating opportunities for societal well-being in the long-term.

New assessment methods and expertise are needed for modelling and scenario developments, that take into account interactions and interdependencies between biodiversity, environment and socio-economic pathways, including the assessment of opportunities and risks. Scientists working on scenarios and models and integrated assessments focus on the post-2020 global biodiversity framework, and on long-term strategic directions to the 2050 vision for biodiversity. This session explored the manners through which the 2050 biodiversity vision should be supported with new analytical and modelling work informing policies and decisions.

Two main points raised during this discussion, were framed around the necessary knowledge for baseline setting and monitoring:

A well-known necessity, towards which, regardless of the efforts, there is still significant progress to be made, is to ensure that scientific data and results are publicly available, in a form useable by policy makers, other researchers and society. This must include local and traditional knowledge, which can inform solutions for biodiversity conservation, sustainable use and recovery of ecosystems. Information availability is key to managing uncertainty, which is one of the major issues when discussing the use of scenarios and models in defining pathways towards the 2050 vision.

Another important process, which is necessary in order to utilise the results coming from the use of scenarios and models, is that the monitoring process should aim to capture progress at multiple scales. There is a need for intermediary milestones to ensure effective tracking and assessments of the impact of the proposed changes, to allow also for timely interventions when further action is needed.

Regarding the research priorities which should be promoted, **two** very important points of the discussion were that:

More transdisciplinary research is needed to identify and fill the gaps in understanding governance for transformational change. There is a need for research informing policies on how to develop effective legislation for conserving biodiversity. It is crucial and urgent to evaluate the progress achieved on addressing the previously identified knowledge gaps.

Maybe one of the most important research priorities is the need to understand trade-offs between development and conservation and to identify thresholds for sectors to stay within sustainable use of biodiversity. To achieve this effectively, this should include the identification and/or development of relevant indicators.



Session 3: Unfolding the 2050 biodiversity vision

The 2050 vision aims at “Living in harmony with nature” where “by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people”. While not expressed in quantitative terms, the elements of the 2050 vision statement provide the essence of a long-term goal for biodiversity. Indeed, the 2050 vision has been interpreted as a 2050 goal for biodiversity in various scenario-building exercises and efforts are under way to provide a more quantitative basis and plausible pathways for achieving such a vision, as discussed below. To identify the potential and required efforts for achieving the 2050 vision in conjunction with key human development goals, scientific evidence can support the design of long-term policy, while allowing for innovation and creativity in the development of new types of narratives and strategies. The use of back-casting thinking allows developing the vision in robust terms and identifying potential pathways to reach it. Combining this with modelling, in different stages, enables us to move from the current situation towards a set of specified actions and targets for achieving the vision. In this session a short discussion on how we can interpret the 2050 vision took place, while the first part of a back-casting thinking experiment was developed in small break-out groups, to allow the participants to express their views on the subject, as well as explore the process in a basic level.

The discussions regarding disentangling the 2050 vision included some very interesting points:

Although starting from a common point, the 2050 CBD biodiversity vision, there is a multidimensional concept across scales and across sectors, with at least three possible approaches: nature for nature, nature for society (natural capital) and nature as culture, the latter which is close to “living in harmony with nature”. The one vision is translated to many visions, with geographic and cultural interpretations and there is a need to identify the actions which will bring us collectively nearer our common vision.

“Bending the curve” of biodiversity decline should be a collective priority and conservation efforts should be increased across the globe. There is a need for the development of positive visions to mobilize short-term action and long-term enhanced national ambition and to ensure that we reach a wider audience. Positive nature futures through participatory scenarios can help developing such positive interpretations of the 2050 vision. This was the aim of the back-casting thinking experiment designed for the forum: not to create “solutions” but introduce the participants in a different mental setting, which can lead to the development of alternative narratives and to the necessary transformations we aim to achieve.

Various regional interpretations of the 2050 vision emerged in regionally organised break-out group discussions. They mirror a variety of approaches, with varying priority setting on poverty alleviation, nature for nature, awareness raising, enhancing social responsibility, limiting damage, strengthening national capacities and trans-disciplinarity (mainstreaming) between sectors and disciplines. An overview of the outputs of the participatory process can be found in Annex 2.

Finally, there is a need to study further and get inspiration from the positive local and regional examples of biodiversity conservation and management efforts. Extracting good practices and lessons learned as well as openly and widely promoting such case studies, which explore new pathways, very often with the use of scenarios and models, can provide inspiration as well as alternative ways of thinking on possible transformation(s).



Session 4: Target setting for the post-2020 framework

Supporting the 2050 biodiversity vision, requires well-defined, ambitious and measurable targets. Discussions are ongoing whether to develop overall science-based biodiversity targets for 2050 equivalent to the 2°C / 1.5°C temperature rise cap, agreed under the Paris Agreement for climate. These targets should express necessity rather than feasibility, and be science-based, succinct, positively framed, bold, and quotable. Success factors, weaknesses, interactions and limits of possible targets, linking CBD, the Paris agreement and SDGs will frame this work. Science can help to make progress in the quantification and attribution/allocation of the targets thanks to new analytical and modelling work on different policy options for governments and different business decisions, and testing them against a range of identified indicators to set milestones for 2030 and 2040.

Break out groups worked on how to enable target setting for the post-2020 agenda, when possible taking into consideration the following categories: a) Land (protection, retention, restoration); b) Oceans; c) Species; d) Direct drivers; e) Indirect drivers.

Discussion on priority areas for target settings included the following main points:

There are strong interconnections between the previous discussions and the appropriate framework for target setting. Developing scenarios can help in identifying alternative pathways of action, by exploring synergies and trade-offs with other domains. Through this process they can inform targets for 2030 and 2040 towards the 2050 vision.

Setting targets is a social and political undertaking, but science can and should inform these decisions. Social sciences should be integrated in this transdisciplinary effort, to identify what is necessary to move towards a biodiversity-rich world, which supports a better life for people.

During discussions, different views emerged on which path to follow: Should the focus be placed on preventing extinctions, reversing decline and retaining intactness of species and ecosystems, according to urgency criteria, building on existing efforts to achieve a minimum safeguarding area for biodiversity? Or should we prioritise the need for massive transformational changes in societal behaviour to address the main drivers for biodiversity loss, which are outside the mandate of biodiversity policy settings, and which are often coming from different places than where the impacts are felt? Why can't the focus be placed on both pathways simultaneously and in a coordinated manner, to achieve results in the limited time-frame available?

Targets need to be more quantitative to ensure they are effective. They need to be responsive to geographical locations and the variety of distributions of biodiversity elements. There is a need for few basic targets, with wide applicability, and the development of sub-targets, in different operational and geographical levels, to assist implementation³.

It is extremely crucial to choose protected areas in land and marine domains, with criteria of urgency regarding biodiversity, not with criteria of surface coverage. Acknowledging that there isn't any flexibility available should be the lever to push for policies which go beyond what is legally required to what is absolutely necessary. Similar approaches need to be taken in reaching different targets.

It is necessary to acknowledge and include in the new narratives, in scenarios and in models, that drivers of change exist also out of the environmental mandate (socio-political changes, technological innovation, as is artificial intelligence, etc.) and this will most likely affect biodiversity.

³ **Additional reflection received during review:** specific assistance and/or "roadmaps" and "toolkits" need to be made available for countries to be able to pick up these new targets within their own contexts, helping them implement and translate targets into their national or sub-national contexts.



Session 5: Scaling up: Nature-Based Solutions for restoration agenda and beyond

The development of new research and policy settings is necessary to tackle at the same time climate change mitigation, adaptation and biodiversity conservation and restoration. Nature Based Solutions (NBS) can support the post-2020 agenda in multiple ways and the perspectives of science and policy in this discussion are valuable. NBS can also support the restoration agenda and can go beyond that with alternative uses, but it is necessary to address the challenges, opportunities and unresolved issues that exist. In particular, this meeting highlighted barriers linked to NBS upscaling in relation to the speed of implementation, its effectiveness, costs of implementation, the sustainability of carbon sequestration and how NBS compare to other mitigation measures. These are all questions with strong research components, and issues of scale, both in terms of geography and time. As one key objective of the *Sharm el-Sheikh to Beijing Action agenda for Nature and People* is to “Inspire and help implement NBS to meet key global challenges”, the forum discussion expanded on the possible contribution of science to knowledge in NBS, focusing on the implementation of the post-2020 agenda, aiming to develop guiding principles when possible and identify the policy needs to emerge.

The discussions on the potential role of Nature-Based Solutions (NBS) provided the following points:

NBS, green infrastructure and natural solutions relate to many decisions of the CBD agenda and interconnect their objectives. Future work on consistency across global biodiversity frameworks, and integrating them with the Sustainable Development Goals could use NBS combining climate change and biodiversity action. NBS are embraced in the *CBD Voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction* (CBD/COP/14/L.23), but their use goes beyond, notably on delivering benefits for climate mitigation, health and livelihoods.

Science makes the case for implementing NBS, in particular for addressing the three Rio Conventions e.g. through IPBES Regional Assessments and the Assessment on Land Degradation and Restoration, the IPCC Special Report on Global Warming of 1.5 C, but also through reports from WWF (Living Planet Report) or work of the IUCN on integrating NBS into strategies to combat climate change. Evidence on benefits and limits of NBS is available, but it needs to become more accessible to decision makers.

NBS upscaling requires transnational approaches that allow thinking globally and acting locally: while objectives can be formulated globally, these must be locally implemented, and account for local biodiversity to guide the implementation of global decisions and objectives (“sharing cases across borders inspires change across borders”, and transnational research engaging with policy and society can foster this inspiration). NBS can be implemented with knowledge from indigenous peoples and local communities, which leads in rural areas to a higher variety of cultural views on what ‘nature’ might be. Implementing NBS leads to mainstreaming biodiversity into other sectors, but this will require working and thinking on longer timescales. Assessing how NBS contribute to growth and jobs, in particular in comparison to “grey” solutions, needs to be done in timescales compatible with global and transformational changes. Research can also help in assessing what governance systems can promote or restrict the deployment and upscaling of NBS.

Due to their systemic, integrated nature, they foster transformation: they call for scientists to further co-create and co-implement with stakeholders (which requires both development of skills and arranging for time to do so, and also funding and recognition for this work), which is also essential in securing ownership of the produced knowledge by policy and society); governance systems should further rely on transdisciplinary and inclusive work to implement NBS successfully, span on longer timescales and build on local roots; funding instruments could turn towards interdisciplinary approaches, allowing higher risks for experimenting with new NBS. Most importantly, investing in NBS allows nature to take the lead of delivering transformative changes.



Session 6: Increasing resilient solutions for restoration

The African Union biodiversity summit, organised ahead of the CBD COP14, focused on avoiding land and ecosystem degradation. The discussions were relevant to the challenge of fast-growing urbanisation and on opportunities and needs for restoration for an increased resilience in Africa. Such actions provide opportunities for tackling both climate change and biodiversity loss by promoting the development and use of Nature Based Solutions. Finding resilient solutions for restoration across ecosystems, together with up-scaling, will enable tangible contributions to sustainable use and sustainability. During this session of the forum, the aim was to achieve further understanding of the need for scaling up restoration and the use of NBS to reach biodiversity targets, setting the focus to the discussions coming from Africa. Scientific opinion on how to make progress towards this goal as well as policy opinions on what is possible until 2030 were parts of the discussion:

Land degradation is undermining the well-being of 3.2 billion people and is the main source for biodiversity loss. Solutions for restoration exist amongst all degraded ecosystems, many based on traditional management systems, including croplands, grazing areas, wetlands or even urban areas.

The African Summit Outcomes include Africa's biodiversity priorities and enabling mechanisms, and a Pan-African Action Agenda on Ecosystem Restoration for Increased Resilience. Science supports the need to implement the African summit declaration to fight degradation and strategic guidance for African priorities in future work programmes. Africa's biodiversity priorities are linked to all three Conventions: Overall goal is to "promote and facilitate regional and national ecosystem restoration across Africa for reversing the loss of biodiversity and ecological infrastructure, combating land degradation and desertification, mitigating and adapting to the effects of climate change, enhancing resilience and improving peoples' well-being". It will be "implemented at various scales — national, regional, subnational, including transboundary ecosystems — and site levels using a land- and seascape perspective". It also sets specific targets for 2025 and 2030, "recognising that reaching them will require promotion of integrated sectoral planning and implementation of policies at all levels and synergies between sectors to enhance outcomes of interventions". Its applicability for restoring ecosystems in other continents should be checked.

The list of priorities for restoration will only be successful if they are integrated into economic sectors and complemented by effective governance structures, stakeholder engagement, implementation arrangements, monitoring and evaluation. Social, financial and biophysical monitoring must be equipped with adequate resources; data should be accessible to the public. It is very important to define a baseline, which can be set by establishing measurements, ecological, social and economic, at the start of the restoration, against which to measure outcomes into the future and provide reliable data for successful restoration. This must be an integral part of all restoration activities.

Consequences of degradation for human health and well-being; links between restoration and climate action; inefficiency of agricultural systems throughout all ecoregions; social and political enablers for restoration are topics which need more scientific research. We need to understand the interaction between land degradation and economic migration within Africa and towards outside Africa. Beyond delivering the technology on how to design and implement solutions, science should help in creating structures for effective governance and capacity building for restoration activities. Decision makers are still underestimating knowledge and expertise of indigenous peoples and local communities for facing degradation and implementing restoration. Integrated sectoral planning is required to achieve key targets and milestones.



Session 7: Uptake of actions towards the 2050 vision⁴

The participatory process developed during sessions 3 (Unfold the 2050 vision) and 4 (Target setting for the post-2020 frameworks) allowed multiple visions, actions and targets to emerge through the group discussions (please also refer to Annex 2). Despite the geographic and cultural differences, a number of actions, similar in their core, emerged through the discussions of the majority of the groups. These actions are (the following set of statements is not representative for all group discussions but gives indications on the main issues discussed):

- Reduce inequalities and ensure equal and sustainable access to environmental resources.
- Embed environmental awareness and understanding at all levels of education.
- Enable access to and connection of all people with nature.
- Implement multi-stakeholder public awareness strategies and capacity building efforts.
- Develop a “green”, sustainable economy.
- Reduce consumption and invest in recognizing and adopting alternative systems of consumption and production that are respectful for biodiversity.
- Intensify work on science-policy interfaces, for more effective biodiversity policies.
- Connect discussions on biodiversity and climate and underline their interconnections in policy, scientific and society domains.
- Develop greener cities and implement urban nature based solutions.
- Ensure wide coverage of biodiversity data with open access for use in science and policy.

Other key inputs to the discussions were:

The Strategic Plan for Biodiversity 2011-2020 – and its associated 20 Aichi Biodiversity Targets – has been one of the largest intergovernmental plans for conserving biodiversity. The international community will need to contribute to processes that will lead to adoption of a post-2020 biodiversity strategy. An urgent challenge is to define how targets and actions can enable transitions and transformational change towards the 2050 vision for biodiversity.

It will require to (i) using evidence (effective use of knowledge), (ii) to think beyond biodiversity (links between ecosystems and the SDGs, different conventions need to be aligned with the mainstreaming agenda); (iii) building and using more ambition (create and increase ambition in the overall aims and objectives on which any targets or milestones are based; protected areas, ecosystem restoration, etc.) and (iv) support uptake (Considering and enabling activities needs to engage people).

To achieve any 2050 vision, we need to more clearly define what is needed to achieve the 2050 vision (identify targets and milestones); planning for a 2030 agenda which is a stepping stone to 2050 and to ensure that the targets build upon each other and are relevant for different stakeholders and actors.

As well as create a real understanding of the values of biodiversity across all generations and society and furthermore identify roles and responsibilities for achieving the 2050 vision.

Again, communication, education and public awareness are identified as key actions for success.

⁴ The set of actions presented here was identified by the different break-out groups discussions (please see also Annex 2), and were submitted to the CBD secretariat directly after the 4th Science forum, as part of an INF document. For reasons of consistency, this section remained unchanged, regardless of the inputs received during the review of this report.



Session 8: Engaging Society, Science and Policy in transformative change

The actions that are required to foster the desired transitions go beyond biodiversity actions and change the way society functions. For defining "transition" actions, what can planetary boundaries and further concepts tell us at global level, while maintaining biotic integrity at local levels? How can society be engaged in this process? The speed of change in technology is at odds with the slow institutional process of change. It is thus essential that the biodiversity community begins to think about how to exploit the opportunities of this change when preventing the weaknesses to transform into threats, e.g. how the biodiversity community can engage consumers and citizens to utilize these technologies in a way that promotes sustainability transitions. The biodiversity regime should engage more directly with societal systems that determine how natural resources are used and how their use implicates biodiversity and ecosystems.

The planetary boundaries concept (2009), introduced the possibility of distilling a complex Earth system into 9 dimensions responsible for keeping the Earth in a hospitable state. The dimensions included in the planetary boundaries framework are climate change, biodiversity loss, land-system change, biogeochemical flows, stratospheric ozone depletion, ocean acidification, freshwater use, atmospheric aerosol loading, and chemical pollution. The concept can provide actions for transitions and a safe operating space for humanity, therefore we need science-based targets, which sustain human well-being and are based on the Planetary Boundaries.

The main points raised during the discussions of the forum, regarding engaging society:

Robust science is one of the drivers that influence policy making. Developing policies and robust conservation strategies based on the best scientific knowledge available is a complex process with many interactions. However, science-based solutions are a hope to change things for better. It is important to have a stronger scientific presence in policy fora, with a strong interaction through science-policy-society interfaces.

Biodiversity as a term remains difficult for parts of the public and policymakers, and science should help in remediating this. Boundaries created by the different "languages" spoken can be overtaken by using the language of the audience addressed. Effective communication again is identified as the key. We need to transform the way we produce and transfer knowledge. There is a need for a more effective outreach to the broader public, the business sector and all relevant stakeholders. This is the precondition to making people aware and to engage them in transformative changes for biodiversity. We need to invest in understanding how requested changes can be translated into governance and changing mind-sets at all levels and across all generations. The way local governments implement legislation directly effects the public opinion. It is equally important that people assume responsibility of their daily activities that can influence change. Drivers of change are not easily linked to their impacts, as they often arise from different places to where their impacts are first felt. Science needs to come up with a clear explanatory communication strategy for this and smart targets to abate and mitigate this, which are obvious to everyone.

Biodiversity is still not a widely understandable concept for the public and science should assume a role in the remediating this. Communication is the key!



Conclusions of the process

The 4th Science-Policy forum aimed and achieved to discuss a variety of issues that are fundamentally connected with the transformations that need to be undertaken in science, policy and society, if we want to prioritise and achieve the 2050 vision of living in harmony with nature and conserving biodiversity. The outputs of the forum underlined the urgency for action as well as the need to operate simultaneously on identifying new pathways for action in target setting and implementation, in governance, in science-policy interfaces.

Both representatives of science and policy stressed the need for more efficient collaboration towards achieving the necessary transitions for sustainability. Science has an important duty in informing policy with the best available science but at the same time policy should also demonstrate a willingness for effective action in mainstreaming activities with biodiversity, promoting Nature-Based Solutions and fostering scientific, social and technological innovation to create new solutions.

The participatory discussions in the regional groups, although demonstrating the important differences in global perspectives regarding biodiversity, as well as the challenges, limitations and opportunities which come hand by hand with our cultural differences, also showcased that there is a common set of actions emerging, regardless of the geographic or cultural setting. Emphasis in education and effective communication are key aspects to achieve the 2050 vision, social innovation as well. Our progress in biodiversity conservation is interlinked with redefining the concept of growth in a planet with limited resources; equity and access to these resources are key elements which we need to discuss if we want to succeed.

These discussions are difficult and will challenge our current economic paradigm, nevertheless we have moved away from the point that we could afford diverging the focus. Actions need to be taken where needed, curing the issues around biodiversity decline directly and effectively, fostering conservation, promoting a wider understanding that protecting biodiversity means protecting our life and our prosperity beyond anything else. Science should and will assume a key role in this process, by advising and consulting, by exploring new pathways and by revealing gaps of knowledge which need to be addressed.

The message of the 4th Science-Policy forum is a message of hope. It is true that there is a lot to be done and it is true that we are in a very critical point regarding the relationship of human kind and nature. Nevertheless, there is scientific and political progress and we have started engaging in the difficult discussions. It is now our obligation to bring these discussions closer to society, determine the everyday role of biodiversity in everybody's life, connecting the bigger picture of biodiversity protection and conservation to the societal challenges of the 21st century and invite society to begin and participate in transformations that will alter our collective priorities and allow us to achieve the 2050 vision of living in harmony with nature.



Next steps

This report, which was reviewed by registered participants of the Forum, will be submitted by 15 December 2018 as input from the Science Forum, responding to CBD notification 2018-063, to provide initial views on the aspects of the scope and content of the post-2020 global biodiversity framework, in particular on the scientific underpinning of the scale and scope of actions necessary to make progress towards the 2050 Vision; and on a possible structure for the post-2020 biodiversity framework.

The results of the Science Forum are recognised in CBD decision CBD/COP/DEC/14/ADV on *Proposals for a comprehensive and participatory process for the preparation of the post-2020 global biodiversity framework* as key source of information that will be used in developing documentation related to the post-2020 process and in informing the activities carried out.

Further follow-up is envisaged to inform the global biodiversity post-2020 process in the respective fora and mechanisms.



Annex 1: Information on the backcasting participatory process

Backcasting is a strategic planning method that asks a group of stakeholders to create one or more ideal future visions and then work **backwards** as a group to figure out what is needed to get to the ideal states from the current state. Imagining a desired future, a vision, can inspire strategy and action, but the path to success is not always obvious.

Backcasting, starts by defining a desired future (e.g. vision) and then looks back to assess what would be required to get there. It can enable stakeholders to introduce more imaginative new ideas — opening up the dialogue for a future we can create. Instead of extrapolating the current to predict the future, we *interpolate* the future from the outcome we desire back to where we are now (the current) and define the values in between — i.e. the roadmap needed to arrive at our intended destination. The idea is to '*imagine our desired or ideal future*' **regardless of whether it is achievable with the technology and financial resources of today**⁵.

Understanding *what* we're really aiming to achieve and *why*, can help us work out the possible pathways of getting there. To help draw out thoughts we can also ask people to describe what's *not* to like about the continuation of the Business As Usual (BAU) alternative⁵.

For backcasting it is quite essential to not only develop a collaborative vision, but to also connect this vision to daily life and with imagining a plausible future in that vision. Without this imagination, without putting it to some extent down to earth, the participants will not be able to get back to the present and to think about actions or targets on the way to this desirable future. The importance of this first step of backcasting is to disconnect as much as possible from the present in order to really imagine a state (and a cultural and policy setting) that has nothing to do with the present situation.

The idea behind this exercise was to begin with the 2050 CBD vision for biodiversity, in groups of participants coming from similar geographic regions. The forum participants were ***asked to use their imagination to make the 2050 vision more tangible, more relatable***.

Once the groups described the 2050 vision for biodiversity in tangible terms, they aimed to work backwards to determine how to reach this desired vision. Backcasting took the participant on a journey to the desired future from the present, by starting with the destination we want to reach, then working backwards. When we aim to achieve sustainable systems-level change and innovation, backcasting is a useful tool and this how we aimed to utilise it during the 4th Science-Policy forum at the framework of the CBD CoP14.

Due to the nature of the back-casting exercise, the participants were separated to groups based on the region where they came from (North America, South America, North Africa, South Africa, Europe Australia, Asia). As the participants had to ***imagine*** the 2050 biodiversity vision on tangible terms and then think on actions and targets, in order to avoid generalities, it was necessary to ground the exercise to real, everyday experience, which could derive from their common natural and cultural backgrounds. Other kind of group forming, could create difficulties for the participants to imagine on the future vision, deliberate and collaborate, as they would have very different understandings of regional biodiversity.

The break out groups were variant in size (2 to 10 people). A short, 5 minutes' presentation was given. **on the meaning of the backcasting exercise and its purpose**, as well as the key thinking points that the participants should keep in their minds.

⁵https://www.sustainablebrands.com/news_and_views/new_metrics/renilde_becque/backcasting_roadmap_transformational_change



Session 3: Unfolding the 2050 biodiversity vision

Initially, the participants had to put forward ideas regarding expressing the 2050 vision in tangible terms based on the following two dimensions:

- looking at the CBD vision for 2050, how will policy, science and practice look like in 2050 in biodiversity management/conservation? What will have been established and functional, i.e. why has the vision been reached and why is it maintained successfully? and
- how does life look like in that climate zone? Life here includes fauna and flora but also how this defines the way of human lifestyles and daily activities. How does the established vision (look point a) influence daily life?

The aim was to end up with a narrative for each group, which will be comprised from descriptive sentences. After some time of putting forward different ideas, the groups had to discuss and prioritise the points of discussion, aiming to end-up with a narrative comprised of 5-8 sentences, describing their vision for “leaving in harmony with nature by 2050”.

During the next step of the exercise, the participants had to discuss on short (2018-2020), medium (2020-2030) and long term actions (2030-2050) necessary to achieve their described vision and accordingly prioritise them and choose 2 on each time frame, as the main output of their discussion.

Session 4: Target setting for the post- 2020 framework

The groups worked on how to enable target setting for the post-2020 agenda, having as a generic roadmap the following generic thematic areas: a) Land (protection, retention, restoration); b) Ocean; c) Species; d) Direct drivers; e) Indirect drivers. The begging of the exercise was invested in putting forward ideas regarding identifying (SMART) biodiversity targets (and when possible, measurable indicators for them) which will allow assessment of the progress towards these targets (and the 2050 vision), while afterwards, the groups should prioritise 5 to 10 targets, according to their perception of the regional needs, as well as their strong and weak aspects from the perspectives of science and policy, as well as their feasibility, if it is a relevant point of discussion.

Session 7: Uptake of actions towards the 2050 vision

- How can these targets and actions enable transitions and transformational change towards the 2050 vision? How can the post-2020 agenda enable the Sustainable Development Goals?
- How can we ensure up-take from Policy? What are the limitations we need to overcome? What does Policy needs from Science in terms of monitoring tools (means discussions on how monitoring can help with uptake of action)? Can we identify good practices?

After the end of the 1st day of the forum, the results of the group discussions were provisionally analysed, in order to put forward the different visions, as well as to identify if there were similarities/common points regarding the actions that are identified as necessary towards the 2050 vision. A list of 10 actions were identified as present in all or almost all discussions and were presented to the participants as a common base for the last part of the exercise. It is crucial to underline here that the facilitation team is solely responsible for the wording used for the description of these 10 actions. This is open to critique, in order to identify disagreements deriving from our cultural, disciplinary and linguistic differences, which should be viewed as opportunities for further discussion and understanding, rather than as barriers.



Building further on the work done during the previous day's sessions, how the identified actions and targets can enable transitions and transformational change towards the 2050 vision, followed by discussion on how can we ensure up-take from policy, limitations, etc. and preparation of a 1 min summary statement of the groups.

Initially, in session 3, eight working groups were formed (South America, Asia, North Africa (Egypt), North America, Europe 1, Europe 2, Europe 3 and International) and all of them developed the 2050 vision, as prescribed by the back-casting exercise. As the participatory work was continued through Session 4, the same afternoon, and Session 7, the next afternoon, the participants in the group fluctuated, with some groups having new participants (North Africa, International) and other groups becoming smaller, than facing the need to merge (Europe 1, 2 and 3 groups). The discussions held in the groups were limited by the available time, but nevertheless they present a variant mosaic of the different concerns of the participants of the 4th Science-Policy forum. These results are ordered according to the respective regional working group in Annex 2.



Annex 2: Backcasting process: Visions collected

VISION from the South America group (facilitator: Omar Defeo)

*In 2050, people in South America will be able to **eradicate or significantly alleviate poverty** by managing biodiversity sustainably as a **strategic resource** - through a solid **science-policy** interface where environmental **governance is inclusive and not fragmented**. Ecosystems and their services will have **recovered completely** and managed with effective and **coherent national policies** and adaptive procedures with **continuous consultations to relevant stakeholders**, in alignment with a social-economic-environmental framework that integrates scientific, **knowledge from Indigenous peoples and local communities**, and foster a vibrant bio-economy.*

ACTIONS

Short-term (2018-2020)

Implement multi-stakeholder public awareness strategies and capacity building efforts, to accelerate the achievement of targets of the NBSAPs;

Prioritize biodiversity in cross-sectoral plans and policies and/or sustainable development plans at the subnational, national, sub-regional and regional levels;

Implement institutional policies region-wide for the standardization and interoperability of data;

Mid-term (2020-2030)

Set clear high-level state policies (long-term) and strengthen governance;

Eliminate perverse incentives (including subsidies) that contribute to biodiversity degradation, while reinvesting in positive incentives directed to adopt sustainable practices;

Improve participatory monitoring, control, enforcement and surveillance systems for a sustainable management of ecosystems and their benefits (e.g., forest and fisheries);

Long-term (2030-2050)

Enhance collaboration among UN dependencies to provide a unique platform for assessing targets that should be generalized/unified;

Develop solid nested governance structures with effective mechanisms for decision making on sustainable management and biodiversity conservation;

TARGETS

Ecosystems and their benefits are managed and harvested sustainably, applying ecosystem based and Nature-Based approaches. [*Indicators: number of species overexploited, Reference Points (targets and limits), intensity of bottom trawling, amount of subsidies*];

Extractive activities (e.g., fisheries and forestry) have no significant adverse impacts on biodiversity and ecosystems, and are within safe ecological limits. [*Indicators: Illegal, Unreported, Unregulated activities reported, Reference Points (targets and limits/thresholds)*];

Data is available from surveys and monitoring to support measurement of targets. [*Indicator: Number of standardized databases available*];

Effective monitoring, control, enforcement and surveillance systems are in place to recover biodiversity. [*Indicator: Number of regulation measures for environmental protection*];

Recovery and restoration plans and measures are in place for overharvested species and degraded ecosystems [*Indicator: Number of regulation measures for environmental protection*].



VISION from the Asia group (facilitator: Miriam Grace)

A future with **no loss of biodiversity**, **ecological restoration** implemented in keeping with national pledges, living in harmony with nature to prevent damage to it, **sustainable development** (natural resources are maintained for future generations) with **a supportive socioeconomic context** including drivers like **green/biodiversity-related job creation** to ensure it is *politically feasible*. We will achieve **mitigation of the climate change** effects. Countries will develop **cooperation to protect biodiversity** and no hostile actions such, as removing water supplies, will occur. **Ecosystem services** will be connected to **conservation** to ensure biodiversity is protected.

ACTIONS

Short term (2018-2020)

Policy: Make the business case for conservation;

Science: Fill limiting knowledge gaps;

Mid-term actions (2020-2030)

Policy: Countries complete NBSAPs⁶; legal compliance for environmental protection by corporations is implemented and enforced;

Science: Gene Bank created and complete to preserve genetic resources;

Long term (2030-2050)

Policy: Education at all stages (childhood upwards);

Science: Develop better technologies to reduce biodiversity loss and models to design sustainable settlements.

Other: **Short-term:** Come up with national capacity needs; Maintain water to downstream countries; Create media campaigns for environmental awareness; Compulsory immediate corporate restoration; Start developing necessary technology; Conduct environmental assessments; Water harvesting in drought-stricken regions for restoration; Adopting Nature-Based Solutions for adaptation and mitigation. **Mid-term:** National capacity building to conduct biodiversity assessments; Land use reform. **Long-term:** Afforestation for climate control and modification.

TARGETS

Oceans

Stop whaling;

No plastic/non-bio-degradable pollution;

No untreated sewage; no oil spills;

Urban

75% of buildings have green infrastructure (GI);

10% of buildings' energy and food needs supplied through GI;

Direct

Awareness – 50% of the rural population lead eco-friendly lives, as measured by surveys comparing to today's baseline;

Indirect

media, global commodity trade – no specific targets identified;

Species

All genes preserved in Gene Banks;

Remote sensing of species migrating across borders – no specific targets identified;

Illegal trade in threatened species decreased by 80%;

⁶ National Biodiversity Strategies and Action Plans



VISION from the North Africa group (Only Egyptian participants) (facilitator: Jorge Ventocilla)
*We live in a world in which **we have learned from past mistakes**. There has been a **change of mind-set**, with greater **environmental awareness** (through education and policy), **availability of data, clean water**, better than use planning and with a **sustainable economy** (green economy and jobs) in place. Corruption will have been extinct so the political and social system will be able to operate better towards a more sustainable future.*

ACTIONS required to achieve this vision, listed taking into account high to low priority, where priority was given to actions that need to be in place (short-term and/or mid-term) before the others can be undertaken (long-term):

Address corruption in administration and governance (overarching action);

Education (from kinder garden to Post Doc);

Development of appropriate infrastructure;

Reliable and unpartisan data / Baselines;

Waste / Water management;

International cooperation;

Green economy and green jobs;

Prevent of brain drain;

Three “umbrella” elements need to be in place for the actions above to be efficient: Enforcement; Political will; Finance

During the session where targets were discussed, the members in the group increased by 100% and the group experienced challenges in implementing the exercise, as the new members had not been involved in the development of the vision and had to be brought up to date with work that had been done previously. The experience, however, was positive, as it was a good opportunity for different stakeholders from the Egyptian society to discuss and experience thinking outside silos.

VISION from the North America group (facilitator: Ute Jacob)

*The **Cost of Carbon is embedded in the economy**, as carbon is the one issues we have to solve, to be able to tackle the rest. In 2050 North America has **minimised their carbon foot print**. The North American Public has been successfully **environmentally educated** and now understands and **values nature** highly. We have achieved a **high Quality Biodiversity data base** at scale in space and time. We have developed a high degree of **key protected biodiversity areas**.*

ACTIONS

Carbon needs to be taxed according to its true cost and the money from the taxation should be used to fund nature based solutions, i.e., tree planting and seagrass restoration, seagrass is a brilliant carbon sink;

Social Media Campaigns, engage the wider public, make biodiversity mean something at all generations and across all of society;

Mainstreaming biodiversity in day to day decisions so that conservation is a part of everyday life rather than an add on;

Use Artificial intelligence (AI) to verify data, bridge gap between biodiversity and technology

Action: Identify key biodiversity areas, apply criteria and set them in place.



VISION from the European group 1 (facilitator: Sandra Naumann)

*We live in harmony with nature. Biodiversity is linked with the issues of **social equality and justice**. Global and local decision-making and actions are well connected and aligned. We have a **carbon neutral, circular economy**. **Cities are green** and resilient, all people have **equal rights, as sustainable management of biodiversity is only possible in a world where we all enjoy the same rights**. There are transparent life-cycle assessments supporting wise and **sustainable consumption and production**. There is **reduction of consumption with focus on the essential**, supported by **education** and tailored **communication for sustainability** and related **social learning** processes across policies, societies and science. Biodiversity and nature are **valued and appreciated equally** by all people across the world. Public policies will discourage resource extraction.*

VISION from the European group 2 (facilitator: Isabel Sousa Pinto)

*People in Europe are living happily **within our ecological footprint and allowing nature to thrive**. We take **responsibilities at individual and society levels** for achieving the vision. All the goods and services cost their true price (**internalization of all costs**). We all have a **daily interaction with nature (greener cities, nature based solutions)** moving from a relation of dominance on nature to one of symbiosis. We live in **peace globally and respect the environment**.*

ACTIONS

Discovering recognising and adopting a sustainable system of consumption that enhances nature;
Each citizen has a personal engagement with nature and has a responsibility to protect it;
Each region produces just what it needs (self-sustainability) and deposits no waste in the environment;
Agricultural fields are reduced and producing more natural varieties;
Plastics replaces by other materials;
No war caused by environment degradation.

VISION from the European group 3 (facilitators: Kristina Raab, Grégoire Dubois, Riikka Palionemi)

*In 2050, nature will include **thriving wildlife** which is **more abundant and more widespread**, and healthy ecosystems delivering **multiple benefits to society**. There will be at least as much (or more) nature to enjoy then as we enjoy now. Environment and nature is **enjoyed and accessed equally** by society. Many people value nature for nature, and **everybody is aware of nature** and sees it in daily life: inside and outside. **The economic system and nature are completely integrated** with each other and environment is a responsibility of all sectors, not just the environment ministry. Europe will be producing **no net losses abroad**. **Policy makers asking questions will receive a response that comprises interacting disciplinary views or knowledge, and science will be responsive (to policy demands), helping society to adapt to changes**.*

ACTIONS

Biodiversity-proof policies: stop subsidising environmental damage (implementation of CAP and CFP). Policies will discourage resource extraction. Don't export environmental damage either, and there will be positive incentives both social and financial for public goods from nature;

Support inter and transdisciplinary science (funding, recognition, inclusion in curricula);

Use diverse communication channels that bring environmental issues to the public;

Use positive examples in communication

Enhance education which incorporates the value and importance of nature



Improve policies with Mediterranean countries: uniformise Europe – as e.g. climate change effects are very differential for instance.

National and subnational targets review and monitoring, accountability and scrutiny (generation in 2050 should benefit from what we have created now).

For the target discussion, two groups had merged, so we discussed two additional actions, 4 and 5 below. The numbers or words in italics were just general indications, should be established based on evidence. We did not reach the level of SMART, these are just ideas for directions targets could take.

TARGETS

Biodiversity-proof policies: subsidies for farmers switching to organic agriculture or integrated practises (public money for public goods). [non-consensus on whether increasing area for organic agriculture is the way forward]; decrease subsidies for polluting practises, remove loopholes in policies that may allow environmental damage to occur anyway; % of GDP that goes to harmful subsidies is less than___;

Support inter and transdisciplinary science (funding, recognition, inclusion in curricula); increase by 30% the budget of research centres and universities dealing with biodiversity topics; regular meetings between scientists and policy makers [disagreement as to whether there wasn't already too many meetings, but ineffective], increase quality of communication between science and policy; include scientists in policy decision making, e.g. in European parliament committees and European Commission;

Use diverse communication channels that bring environmental issues to the public. Put advertisements for biodiversity on TV, and also on social media (measure #ads, #people following); include citizen science in school kids' education (measure #schools, #students reached); include the biodiversity crisis in curricula at all levels, as well as positive examples & success stories;

Change consumption patterns: possible measurable targets: ~halve meat consumption, local and organic production is x% of total consumption, environmental footprint per citizen is ---;

Equity in governance and decision-making: %participation in boards at all levels is improved, proportional representation is an option here (for women, youth, indigenous peoples and local communities); level of satisfaction with the process should exceed x% (to ensure differential speaking times and influence of what is said/take-up is accounted for); sustainable management of biodiversity is possible only in a world where all would have equal rights; and the last point was not consensus: local governance increases equity-local governments should have more say in biodiversity governance;

VISION from International group (facilitator: Zoi Konstantinou)

*We have reached the past targets regarding climate and biodiversity (temperature rise below 1.5°C, living in harmony with nature. No distinction is made anymore between society, culture and nature. All people have a **relationship with nature**, appreciate it and recognise the importance of nature. They have awareness regarding the importance of biodiversity for everyday life. The **values of nature are embedded to all levels of education and transmitted into actions**. People are **fully connected with nature**, through access and awareness of nature. The **urban areas have become sufficiently greener spaces**, where blue and green connectivity has been developed and **nature based solutions** are promoted to create better spaces. All new development in urban areas is green. Worldwide, the food production is organic, promoting sustainable, healthy and diverse crops. All plant based **material is produced from 100% sustainable sources**. There is abundance of open licence biodiversity related data*



(including socio-economic data) which are used for the development of efficient science and effective policy. Species populations are not declining anymore and previously protected species have escaped the danger of extinction. Peoples' health and well-being is at the centre of the economic system and the GDP is replaced by indicators that reflect sustainability

ACTIONS

Short-term (2018-2020)

All data which is generated through public research or EIA is under open license to be used for science and policy;

Development of economic indicators of growth which include externalities

Mid-term (2020-2030)

Zero plastic and 100% bio-plastic usage;

Environmental science embedded in all levels of education;

All plan based production comes from sustainable culture;

50% of all new urban development is "green" and NBS are promoted in urban settings;

Sustainable development is the overarching goal of all governments;

Create collectively managed green spaces in urban areas, to enhance the society's connection with nature as well as to strengthen societal collaboration towards a more sustainable future;

Proliferation of locally managed Protected Areas that support sustainable livelihoods.

Long-term (2030-2050)

Change the consumption pattern. Develop a consumption and production system which is not harmful to nature.

In terms of governance, provide the ministers of environment with increased power and the possibility to "veto" specific decisions, should there be indications that these decisions can harm biodiversity/nature/

TARGETS

The group's discussion focused mainly on the appropriate framework for target setting rather than going into the identification of specific targets. A key point raised was that the Aichi targets should not be dismissed, but be more promoted and explained better, in order to be wider understood from civil society and other sectors. At the same time, it is necessary to recognise their weaknesses and work on the post 2020 framework in order to overcome them. Aichi targets were recognised as limited in scope, sometimes not even reflecting actual biodiversity targets, so there is a need to work in making them broader and deal with the underlining drivers. Opinions were expressed supporting the adoption of less targets which will be differently organised: Only few biodiversity targets which will reflect the status of the systems [proposed categories: Land/Ocean/Plants/Fresh water/Species] and will be widely applicable globally, with a different level of a few supportive targets, more specific in order to support actions and another level of indicators which will be used to facilitate these actions. An important point raised was that, regardless of the quality of targets, important prerequisites for success are: a) better implementation guidelines and monitoring and b) political will and awareness.

SCALING UP ACTIONS

The group decided to discuss on a) embedding environmental awareness and understanding in all levels of education and on b) implementing multi-stakeholders' public awareness strategies and capacity building efforts, trying to enhance/create communication paths;

Regarding education, the following points were raised:



Embed sustainable development and biodiversity education into school curricula; Enhance the concept of biodiversity literacy, in order to also drive appropriate teachers' training; Develop courses and exercises which bring important issues of biodiversity conservation (i.e. target setting) into students and teachers everyday life; Finally, keep in mind that no matter how successful education is, if we don't ensure a decent quality of life for everybody, behaviours that are harming for biodiversity will prevail. Closing with a positive point, as science is becoming more mature, less uncertain, it will find better ways to interface with education.

Regarding communication, the following points were raised:

Experience has shown that when the right message is transferred through the right channel and probably through the right person/champion, they can have remarkable results in terms of setting a positive "trend". We should analyse the good examples to understand why they worked, in order to repeat them. When such an opportunity arises, we should take advantage of the moment to introduce policies which are beneficial for biodiversity. Additionally, we should put more effort in translating biodiversity's importance and the meaning of targets, for specific groups, using the appropriate language each time – communication and social sciences have an important role to play here.



Annex 3: Statement provided by the organisers to plenary

- To bend the curve of biodiversity loss, we recognized the need for massive and robust efforts for transformational changes across all levels of biodiversity, to support health and better life for human society.
- Overall, the main changes needed are social, transforming mind-settings, mainstreaming biodiversity to make the balance between development and conservation and create ecological, social and political connectivity.
- More than ever, the concept of solving global problems with local solutions is recognized and will require efforts, including from science, to develop more effective communication, policy and governance models.
- We understood that socio-political changes require complex, transdisciplinary science, integrating natural and social sciences, as well as clear-cut answers, and that scientific evidence is but one element to be taken into consideration.
- Thus we made (and will continue making) the utmost efforts to reach feasible and viable actions to ensure that policies benefit from the support of the best scientific evidence available in understandable language.
- At the same time, we recognize that equal consideration has to be given to knowledge from indigenous peoples and local communities, which runs parallel to “science” and that knowledge can also well inform solutions for biodiversity conservation, sustainable use and recovery.
- We recommend the 2050 vision be multidimensional, including nature for nature, nature for society and nature as part of cultures, seeking for balance in order to achieve the common vision of “living in harmony with nature”.
- Preventing extinctions, reversing decline, retaining intactness, as well as restoring ecosystems, will also be key to bending the curve for biodiversity.
- But this will not be enough. Priority should be given to addressing the main drivers for biodiversity loss, some of which may be outside the mandate of biodiversity policy settings, and often arise from different places than where the impacts are felt.
- Science also understands that Nature-Based Solutions are one of the best pathways for interlinkages with other global agendas, such as climate change and across SDGs. Implementing innovative Nature-Based Solutions can lead the way for transformative biodiversity governance, by also considering social justice and considering that benefits will not be distributed equally.
- Two types of innovation will be necessary, incremental (little by little but long-lasting), and radical innovation, which requires higher capacities to change along with some “undo” actions.
- As for target setting there is a great need for aligning global commitments with local/national policies; as well as mainstreaming biodiversity across sectorial silos.
- Science needs to help understanding trade-offs between development and conservation and identifying thresholds for sectors to stay within sustainable use of biodiversity. This should be translated into adequate and relevant indicators.
- Finally, we recommend enabling conditions such as awareness raising, data and information availability to measure progress and funding for cost-effective solutions, to implement the post-2020 agenda.



Annex 4: Suggested References⁷

General and session 1

Recommendation SBSTTA-XXI/1: Scenarios for the 2050 Vision for Biodiversity. This SBSTTA recommendation invites scientists working on scenarios and related assessments to focus on the development of the post-2020 global biodiversity framework, and on long-term strategic directions to 2050 vision. <https://www.cbd.int/recommendations/sbstta/?m=sbstta-21>

[CBD/COP/14/L30: Scenarios for the 2050 vision for biodiversity](#)

CBD information web page on the preparation of the post-2020 global biodiversity framework. This includes submissions from Parties, other Governments, relevant organizations and indigenous peoples and local communities on the preparations for the Post-2020 Biodiversity Framework, as well as results of the Bogis-Bossey Dialogues for Biodiversity Transformation, and the CBD Seminar on Transformational Change for the Biodiversity Agenda. <https://www.cbd.int/post2020/>

[CBD/COP/14/9: Long-term strategic directions to the 2050 Vision for Biodiversity](#), approaches to living in harmony with nature and preparation for the post-2020 global biodiversity framework

[CBD/COP/14/12 Sharm El-Sheikh Declaration](#) - Investing in Biodiversity for People and Planet

IPBES Summaries for policymakers are available on <https://www.ipbes.net/document-library-categories/assessment-reports-and-outputs>

CBD/SBSTTA/22/INF/31 Effective use of knowledge in developing the post-2020 global biodiversity framework (Framing the Future for Biodiversity: Effective use of knowledge in developing a post-2020 global biodiversity agenda. Report of the meeting of the Cambridge Conservation Initiative). <https://www.cbd.int/meetings/SBSTTA-22>

WWF Living Planet Report 2018 <https://www.worldwildlife.org/pages/living-planet-report-2018>

Trajectories of the Earth System in the Anthropocene (2018). Will Steffen et al. PNAS published ahead of print August 6, 2018, <https://doi.org/10.1073/pnas.1810141115>

[CBD/COP/14/INF/27: Seminar on Transformational Change for the Biodiversity Agenda](#): (the third Bogis-Bossey Dialogue for Biodiversity)

Session 2

[Aiming higher to bend the curve of biodiversity loss \(2018\)](#), Mace, G. M., Barrett, M. Burgess, N. D., Cornell, S.E., Freeman, R., Grooten, M., Purvis, A. Nature Sustainability. doi: 10.1038/s41893-018-0130-0

The Bending The Curve initiative set out to advance quantitative modelling techniques towards ambitious scenarios for biodiversity: Towards pathways bending the curve of terrestrial biodiversity trends within the 21st century. Leclerc D, Obersteiner M, Alkemade R, Almond R, Barrett M, Bunting G, Burgess N, Butchart S, et al. (2018). <http://pure.iiasa.ac.at/15241>

[CBD/COP/14/INF/24](#) Key findings from the four IPBES Regional Assessments.

⁷ This list is not exhaustive.



[CBD/COP/14/5/ADD2](#) Analysis of the contribution of targets established by Parties and progress towards the Aichi Biodiversity Targets

[Recommendation SBSTTA 22/4:](#) Updated scientific assessment of progress towards selected Aichi Biodiversity Targets and options to accelerate progress

[Visions for nature and nature's contributions to people for the 21st century](#) (2017). Lundquist, C., H. M. Pereira., et al. NIWA Science and Technology Series

Monitoring biodiversity change through effective global coordination (2017), Laetitia M Navarro et al. <https://doi.org/10.1016/j.cosust.2018.02.005>

Session 3 and 4

[CBD/COP/14/INF/25 Safeguarding space for nature and securing our future:](#) Key role in post-2020 global biodiversity framework of positive and common messaging about the role of space for nature in the conservation of both biodiversity and ecosystem services, supported by science and coordinated public and political communication strategies

How Sectors Can Contribute to Sustainable Use and Conservation of Biodiversity (2014). CBD Technical Series No. 79, available at <https://www.cbd.int/doc/publications/cbd-ts-79-en.pdf> (Coordinating Authors Marcel Kok, Rob Alkemade)

Investments to reverse biodiversity loss are economically beneficial (2017), Sumaila, R. *et al.* In: Current Opinion in Environmental Sustainability 29: 82-88. <https://doi.org/10.1016/j.cosust.2018.01.007>)

IPBES Guide on production and integration of assessments from and across all scales <https://www.ipbes.net/guide-production-assessments>

[CBD/COP/14/INF/16:](#) Preliminary synthesis and analysis of views on the scope and content of the post-2020 global biodiversity framework

[CBD decision XIII/28, Indicators for the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets:](#) additional indicators identified by the Biodiversity Indicators Partnership and the indicators for targets under the Sustainable Development Goals.

[Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services: moving a step closer to an IPCC-like mechanism for biodiversity](#) (2010), A. Larigauderie and Harold A. Mooney

Session 5

[Recommendation SBSTTA 22/7 on Biodiversity and climate change:](#) ecosystem-based approaches to climate change adaptation and disaster risk reduction

[CBD/CCB/WS/2018/2/3 Report of the Workshop on Biodiversity and Climate Change:](#) integrated science for coherent policy with UNFCCC/IPCC and CBD/IPBES: this meeting highlighted that NBS can be “win-win” measures for achieving co-benefits between climate change and biodiversity, and the Sustainable Development Goals.

[CBD/COP/14/INF/22](#) Key messages from the workshop on “biodiversity and climate change: integrated science for coherent policy”



[CBD/COP/14/L23 Biodiversity and climate change](#): encourages Parties and other Governments to integrate ecosystem-based approaches when updating their nationally determined contributions

[UN Biodiversity Conference 2018, Sharm El-Sheikh, Egypt Announcement](#): One key objective of the *Sharm el-Sheikh to Beijing Action agenda for Nature and People* is to “Inspire and help implement Nature-Based Solutions to meet key global challenges”.

Session 6:

[CBD decision XIII/5 Ecosystem restoration: short-term action plan](#)

[IPBES Summary for policymakers](#) of the Assessment Report on Land Degradation and Restoration

[IPBES Summary for policymakers](#) of the regional and subregional assessment of biodiversity and ecosystem services for Africa

The African Ministerial Summit on Biodiversity on 13/11/18 under the theme “Land and ecosystem degradation and restoration: Priorities for increased investments in biodiversity and resilience in Africa”, adopted, among others, the African Ministerial Declaration on Biodiversity and the Pan-African Action Agenda on Ecosystem Restoration for Increased Resilience.
<https://www.cbd.int/conferences/2018/cop-14-afr-hls>

Session 7:

[IPBES Summary for Policymakers](#) of the Assessment Report on Land Degradation and Restoration assessing Aichi targets vs SDGs: “A4. Avoiding, reducing and reversing land degradation is essential for meeting the Sustainable Development Goals contained in Agenda 2030”.

[IPBES Summary for Policymakers](#) of the regional and subregional assessment of biodiversity and ecosystem services for Europe and Central Asia: extract of D: “The continuation of past and present trends in drivers to, and beyond, 2030 (...) will inhibit the widespread achievement of goals similar to and including the Sustainable Development Goals. “

Session 8:

The 4th Industrial Revolution, by the World Economic Forum: <https://www.weforum.org/about/the-fourth-industrial-revolution-by-klaus-schwab>

The planetary boundaries concept by the Stockholm Resilience Centre: <https://www.stockholmresilience.org/research/planetary-boundaries.html>

[CBD/COP/14/INF/31](#) Engaging business in the development of a post-2020 global biodiversity framework

[CBD/COP/14/INF/20](#) Recommendations for increased focus on connecting people with nature to inspire enhanced action on biodiversity conservation

[Recommendation SBBTA/SBI/2/19](#): Proposals for a comprehensive and participatory process for the preparation of the post-2020 global biodiversity framework

The IPBES Conceptual Framework — connecting nature and people (2015). Sandra Diaz et al. <https://doi.org/10.1016/j.cosust.2014.11.002>



Annex 5: Participants Agenda

A participants' agenda was sent out in advance to inform on topics and setup of the eight sessions, providing background information and guiding questions. The version presented in this Annex is slightly modified to reflect changes, which occurred during the two days of the Science Forum. For the names of speakers and panellists, please see Annex 6, Short agenda (updated).

23/11/2018. Day 1: A framework for transition.

Which framing for the target setting for the post-2020 framework?

Opening addresses

Introduction: Aims and outputs of this dialogue

What are the expectations from the CBD secretariat for this dialogue? Which process will benefit from this dialogue? Which outcomes would be useful? Lessons from the 2010 and 2020 policies on biodiversity and the need for a new vision, as well as what scenarios to 2050 can tell us. What are the options? What is necessary? How to make it happen? How to ensure action? The presentation will draw the path from Sharm el-Sheikh to Beijing.

Session 1: Concepts of transition

Setting the ground for broader understanding of transitions and the need for social-ecological transformations with views from key scientists. Bending the curve – how to come to the 2050 vision and new targets for the post-2020 agenda. What is the role that research should take? How to cope with uncertainty when designing and implementing urgent measures? How can NBS support the 2050 vision, and allow us to achieve biodiversity and development goals in a more coherent manner? What should our expectations and priorities be?

Panel discussion (and active involvement of audience) on the role of transitions for the post-2020 process from the scientists' perspectives; reactions from policy makers; reflections from experience what is possible (from panel and audience). Participants in the panel will have 2-4 minutes to make a statement on the content of the session, to stimulate the discussion.

The moderator asks panellists to give short statements on the theme of session. A moderated discussion between panel and audience follows, based on the guiding questions of the session.

Background

- **Transitions** are defined as long-term processes of disruptive and non-linear systemic change in complex societal systems, such as economic sectors or regions. As transitions imply break-down and destabilization of the regime while, at the same time, future pathways and outcomes are still unclear, they often involve a high degree of uncertainty. Therefore, it is important to focus on desired transitions towards the vision for 2050 in this session.
- Our collective actions and policy decisions during the coming years will largely influence the future outcomes of emerging transitions. It is necessary to agree upon global targets that actually lead to transformative actions on the ground, as well as to aim for effective translation of scientific and expert knowledge on biodiversity and ecosystem challenges.
- Within the broader global transition, there is a biodiversity transition taking place in the way biodiversity conservation and sustainable use is understood, organized and implemented. We



need to better define the guiding mission of this transition, as well as to identify pathways to institutionalize practices, culture, and structures that support a sustainable economy.

- With this session we aim to seek a broader understanding of transitions and the need for social-ecological transformations for biodiversity conservation and sustainable use. We wish to re-think the concepts, keeping in mind the post-2020 framework and the biodiversity vision towards 2050. What should be our goals, our expectations and what should be our priorities? Can we think outside the box and re-evaluate the interpretations of terms such as growth and prosperity?

How could the Convention on Biological Diversity facilitate this transition by: (a) bringing scientific knowledge to Parties in order to identify transition potentials; (b) supporting the development of national and sectoral transition strategies; (c) synthesizing national ambitions and implementation agendas; and (d) bringing in new methods, processes and expertise?

Guiding Questions:

- a) What does transformational change mean in terms of biodiversity action, from the perspective of science and of policy?
- b) How is this translated to the transformations we need to achieve the 2050 biodiversity vision?
- c) How can we foresee/internalise these transformations into global and national policy actions?

Session 2: From the current to the future status of biodiversity

What is the current state of biodiversity? How can we promote the role of integrated assessments and scenarios/models for policy making in the post-2020 process? What can research advance on devising and adapting the pathways? How to bring this into the post-2020 biodiversity discussion? This session will give input to session 4 on framing the post 2020 targets.

Panel discussion (and active involvement of audience) on role of science for developing and applying scenarios and models for pathways to 2050 [to focus on specific aspects].

The moderator asks panellists to give short statements on the theme of session. A moderated discussion between panel and audience follows, based on the guiding questions of the session.

Background

- We now know with certainty that systemic change is necessary to change the current state of biodiversity. Ecological and resilience research shows that current processes in climate and ecosystems that might lead to an acceleration of environmental disruption in the next decades with irreversible change that could lead to catastrophic consequences for life on Earth. Unmitigated economic and societal pressure on the environment makes such tipping points more likely to occur. The embedded nature of currently dominant and unsustainable cultures, structures and practices makes biodiversity conservation challenging. Remediating or softening their negative impacts is not sufficient to reduce the long-term and fundamental risks these impacts pose to societies, let alone improving the state of the environment or creating opportunities for societal well-being in the long-term.
- New assessment methods and expertise are needed for modelling and scenario developments, that take into account interactions and interdependencies between biodiversity, environment and socio-economic pathways, including the assessment of opportunities and risks. Scientists working on scenarios and models and integrated assessments focus on the post-2020 global biodiversity framework, and on long-term strategic directions to the 2050 vision for biodiversity.



- The 2050 biodiversity vision should be supported with new analytical and modelling work informing policies and decisions, and testing them against the range of identified indicators. This session will look into the role of more integrated assessments, and monitoring processes.

Guiding Questions:

- a) What information can science provide for the current state of biodiversity? What are the key monitoring tools to assess progress in improving its state?
- b) What are the limitations of existing methods and processes science need to overcome (e.g. the need to better integrate interactions and dependencies between the different components of biodiversity and social, environmental/climate and economic drivers of change)?
- c) How can science inform policy through scenarios on what kind of actions are feasible? What does policy need from science in terms of modelling and assessment? How to deal with uncertainty?

Session 3: Unfolding the 2050 biodiversity vision

Starting from the CBD 2050 vision for biodiversity, how can we translate it into tangible terms regarding science, policy and society in regional and global levels? And after “painting the picture” of the future vision, what are the short and long-term actions that we need to undertake to reach it? Inputs from the speakers will provide an introduction for a participatory back-casting exercise, the results of which will provide input for session 4.

Breakout groups will work on two exercises: a) aiming to make the 2050 biodiversity vision more tangible by describing how this vision will be translated in every day’s life; and b) keeping this tangible description of the vision in mind, identify actions which will allow us to reach it.

Background:

- The 2050 vision aims at “Living in harmony with nature” where “by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people”. While not expressed in quantitative terms, the elements of the 2050 vision statement provide the essence of a long-term goal for biodiversity. Indeed, the 2050 vision has been interpreted as a 2050 goal for biodiversity in various scenario-building exercises and efforts are under way to provide a more quantitative basis and plausible pathways for achieving such a vision, as discussed below.
- To identify the potential and required efforts for achieving the 2050 vision in conjunction with key human development goals, scientific evidence can support the design of long-term policy, while allowing for innovation and creativity in the development of new types of narratives and strategies. The use of back-casting thinking allows developing the vision in robust terms and identifying potential pathways to reach it. Combining this with modelling enable us to move from the current situation towards a set of specified actions and targets for achieving the vision.
- Pathways consist of different engagement strategies and courses of actions that build on each other, from short-term to long-term actions into broader transformation. Working on pathways allows going beyond the biodiversity conservation community, working across sectors on the practice of qualitative problem analysis and policy-led implementation of solutions. Developing pathways is a way of engaging policy- and decision-makers on which strategies and actions may be compatible with an identified vision.
- Pathways and back-casting enable us to inform discussions on scope and possible content of the post-2020 global biodiversity framework, including on scale and scope of actions necessary to make progress towards 2050.



- In this session we want to explore together the role of back-casting and pathways in the development of new narratives and strategies which can unfold the 2050 vision. This should prepare for the development of different strategies and actions reflecting the engagement of different sectors, types of stakeholders and on multiple scales. Starting from the 2050 vision for biodiversity, how can we translate it into tangible terms regarding science, policy and society at regional and global levels? And after “painting the picture” of the future vision, what are the short and long-term actions that we need to undertake to reach it? The results of this participatory back-casting exercise will provide input for session 4.

Guiding questions:

- a) Starting with the 2050 vision in mind: How would this vision translate in tangible terms, regarding biodiversity, in everyday life, at the local/regional, international level?
- b) Keeping these tangible interpretations of the 2050 vision in mind, which actions we need to undertake to bring ourselves there?

Session 4: Target setting for the post- 2020 framework

Translating the necessary actions to reach the 2050 biodiversity vision into target areas for the post-2020 framework: How can science help to make progress in the quantification and attribution/ allocation of the targets? How can measurable indicators and actions allow us assessing progress towards these targets (and the 2050 vision)? This session looks closer at key areas for target setting:

- a. Land (protection, retention, restoration)
- b. Oceans
- c. Species
- d. Direct drivers (include which ones)
- e. Indirect drivers (include which ones)

The moderator asks panellists to give short statements on the theme of session. The rest of the time will be devoted to work in the break-out groups.

Break out groups will work on how to enable target setting for the post-2020 agenda.

Background:

- To support the 2050 biodiversity vision, we need well-defined, ambitious and measurable targets. Science can help making progress in the quantification and attribution/allocation of the targets thanks to new analytical and modelling work on different policy options for governments and different business decisions, and testing them against a range of identified indicators to set milestones for 2030 and 2040.
- Discussions are ongoing whether to develop overall science-based biodiversity targets for 2050 equivalent to the 2°C / 1.5°C temperature rise cap agreed under the Paris Agreement for climate. These targets should express necessity rather than feasibility, and be science-based, succinct, positively framed, bold, and quotable. Success factors, weaknesses, interactions and limits of possible targets, linking CBD, the Paris agreement and SDGs will frame this work.
- Beyond the SMART framing, the session should look into other framework conditions:
 - Existing targets not yet implemented/new commitment targets
 - Specificities between outcome-oriented and process-oriented targets
 - Establishing clear links with the policies necessary to reach the targets, as well as with the 2050 vision and other key global commitments like the SDGs.



- Beyond any accountability of CBD parties, can the targets be disaggregated for sub-national and local governments and for different types of non-state actors wishing to commit voluntary (specific economic sectors, financial organisations, etc.)?
- How to maximise synergies and reduce trade-off between different targets?
- This work should build on existing indicators, including those listed in decision XIII/28, additional indicators identified by the Biodiversity Indicators Partnership and the indicators for targets under the Sustainable Development Goals.

Guiding Questions:

- a) Development of SMART biodiversity targets and measurable indicators and actions which will allow us assess our progress towards these targets (and the 2050 vision)
- b) What are the best targets from the perspective of policy and science (pro & contra)?

24/11/2018. Day 2: Increasing solutions for restoration (scaling-up Nature-Based Solutions).

Which transitions for transformational change? Implementation

Session 5: Scaling up: Nature-Based Solutions for restoration agenda and beyond

This session informs on needs for research and policy setting on restoration to be taken further for giving multiple benefits beyond climate change mitigation, adaptation and biodiversity conservation and restoration. Can such Nature-Based Solutions help achieving across the Sustainable Development Goals? Which challenges, opportunities and unresolved issues exist?

Panel discussion and plenary discussion: What can science say for scaling-up restoration and connecting it to human needs (CBD restoration action plan and ecosystem-based approaches for climate change and disaster risk reduction)? How can NBS help bringing the biodiversity and climate change agenda together?

The moderator asks panellists to give short statements on the theme of session. A moderated discussion between panel and audience follows, based on the guiding questions of the session.

Background

- We need new research and policy settings which tackle at the same time climate change mitigation, adaptation and biodiversity conservation and restoration. How NBS will support the post-2020 agenda is part of the discussion we want to have with scientists and policy-makers.
- How can NBS also support the restoration agenda? Which use of NBS goes beyond restoration? Which challenges, opportunities and unresolved issues exist?
- The session will also look at the follow-up of the meeting between IPCC and IPBES on climate change and biodiversity in Paris (18/10/18). This meeting highlighted that NBS as “win-win” measures for achieving co-benefits between climate change and biodiversity, and the SDGs.
- One key objective of the *Sharm el-Sheikh to Beijing Action agenda for Nature and People* is to “Inspire and help implement NBS to meet key global challenges”. How to implement this?
- How could science contribute to knowledge on NBS, focusing on implementing the post-2020 agenda? Could there be guiding principles? What are the policy needs?



Guiding Questions:

- How can NBS assist restoration actions in achieving our goals towards the 2050 vision? What is the role of science on that and what are the policy needs?
- What is the role of NBS in combining the requirements of biodiversity and climate change agenda together? How NBS can contribute/become part of the future perspective?

Session 6: Increasing resilient solutions for restoration

Understanding the need for restoration and using Nature-Based Solutions, including in urban settings, to reach biodiversity targets, on the example of Africa. Which are the recommendations of science for policy makers? What is the role that research should take? How to bring this into the post-2020 biodiversity discussion? What are the options? What can be done?

Panel and plenary discussion on role of science for scaling-up restoration and connecting it to human needs (linking to the CBD restoration action plan and ecosystem-based approaches for climate change and disaster risk reduction).

The moderator asks panellists to give short statements on the theme of session. A moderated discussion between panel and audience follows, based on the guiding questions of the session.

Background

- The African Union biodiversity summit ahead of COP focused on avoiding land and ecosystem degradation. The discussions were relevant to the challenge of fast growing urbanisation and on opportunities for restoration and on the need for restoration for an increased resilience in Africa. Such actions provide opportunities for tackling both climate change and biodiversity loss by promoting the development and use of Nature-Based Solutions. Finding resilient solutions for restoration, together with up-scaling, will be the core of the discussion across ecosystems – so that we can contribute to sustainable use and sustainability.
- A conservation approach based on restoration of natural capital could lead to a future vision embracing both protection and development, connecting the biodiversity community with like-minded actors, representing sustainable businesses, local initiatives, and other sectors and stakeholders embarking on sustainability pathways for all terrestrial and marine ecosystems.
- During this session we would like to achieve further understanding of the need for scaling up restoration and the use of Nature-Based Solutions, including in urban settings, to reach biodiversity targets, setting our focus to the discussions coming from Africa. What can science say on how to achieve it? What do policy-makers believe is possible for 2030? What is the role that research should take? How can this be brought into the post-2020 biodiversity discussion? What are the options? What can be done?

Questions to be discussed:

- What can science do to support the scaling-up of restoration, the role of NBS for restoration, and what are the needs of policy regarding that?
- How can restoration goals be transformed into SMART targets connected to biodiversity conservation?
- How can the input from the African Summit regarding the role of restoration be used in other regions? Can good practices and lessons learned in other regions be applied in Africa?



Session 7: Uptake of actions towards the 2050 vision

Understanding the frame in which the targets are set in the post-2020 agenda to prepare for the development of the post-2020 global biodiversity targets. Building on the results of the back-casting exercise of day 1 (sessions 3 and 4), participants will work towards connecting post-2020 targets with the Sustainable Development Goals and discussing challenges and opportunities in that context.

Break out groups: 10-12 people in each group, with groups for uptake of sessions 3, 4, 5, 6.

Background:

This session should build upon the results from sessions 3 (Unfold the 2050 vision) and 4 (Target setting for the post-2020 frameworks). It should also take the role of NBS (session 5) and the restoration agenda (session 6) for the post-2020 framework into account.

Guiding questions:

- How can these targets and actions enable transitions and transformational change towards the 2050 vision? How can the post-2020 agenda enable the Sustainable Development Goals?
- Which incentives to implement restoration actions? Can upscaling NBS make a difference in the uptake of action, because they deliver different benefits at once?
- How can we ensure up-take from policy? What are the limitations we need to overcome? Can monitoring tools help with the uptake of actions? Can we identify good practices?

Session 8: Engaging Society, Science and Policy in transformative change

Discussion on the needs from science in implementing social-ecological transitions. Where should future research focus on? How to engage various stakeholders? What are priorities for research and policy to advance transitions regarding social-ecological systems, biodiversity and benefits from nature?

Panel and plenary discussion on how society can be engaged in implementing transitions and on the role of science in implementing social-ecological transitions, through future research priorities.

The moderator asks panellists to give short statements on the theme of session. A moderated discussion between panel and audience follows, based on the guiding questions of the session.

Background

- The actions that are required to foster the desired transitions go beyond biodiversity actions and change the way society functions. The global biodiversity agenda should connect with the targets and processes of other international agreements, like the SDGs and the Paris Climate Agreement.
- Experts argue that we have now entered the fourth industrial revolution, an era characterized by multiple different technologies that are being created at an incredible speed and scale. These new technologies are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries. This 4th industrial revolution presents a wide range of opportunities, but also risks. Therefore, it is imperative to better understand it, utilize it, and channel it to better prepare societies for the future and to better safeguard the Earth.
- For defining "transition" actions, what can planetary boundaries, the 4th industrial revolution and further concepts tell us at global level, while maintaining biotic integrity at local levels? How can society be engaged in this process?



- The speed of change in technology is at odds with the slow institutional process of change. It is thus essential that the biodiversity community begins to think about how to exploit the opportunities of this revolution when preventing the weaknesses to transform into threats, e.g. how the biodiversity community can engage consumers and citizens to utilize these technologies in a way that promotes sustainability transitions?
- The biodiversity regime should engage more directly with societal systems that determine how natural resources are used and how their use implicates biodiversity and ecosystems, for example in agriculture, fisheries, forestry, tourism, energy, mining and infrastructure, health and manufacturing, all of which are sectors in which biodiversity needs to be mainstreamed as per the decisions of the Conference of the Parties to the Convention. Additionally, how can economic, financial and ecological policies and actions be designed to place biodiversity at the centre of the development paradigm as a key natural asset?

Questions to be discussed

- a) Discuss how society can be engaged in this transition process for the biodiversity agenda?
- b) How can science inform progress? Could we look for impacts in biodiversity? At which pace? What are the tangible, future research priorities we need to focus on to achieve the necessary transitions?
- c) Discussion on the role of science in implementing and supporting social-ecological transitions, through future research priorities: which requests do policy makers have towards researchers? And which requests can researchers tackle, and how?

Synthesis: Wrap-up and next steps

EKLIPSE with panel from IUBS, EC, IAI, CBD secretariat: Meeting conclusions and recommendations suggested for the post-2020 process.

The facilitator will provide a 15-minute presentation, summarizing the conclusions of the sessions of the Forum, with particular emphasis on the work of the groups, in two blocks (for day 1 and for day 2). Participants will be invited to give additional inputs from the panel and the audience for the final refinement/structuring of these conclusions. The panel members will be asked to give their opinion on the development and outputs of the forum. The facilitator will invite comments and inputs from the audience on the overall setting of the meeting and the potential for the development of future similar discussions.

Two interventions will give an outlook on possible follow-up actions and future use on the outputs of this Science Forum.

Participants will be asked for their further suggestions.

In closing this session, participants will also be asked whether they agree on the messages this Science Forum gives to the COP and to the further process on discussion the post-2020 agenda.

Closing panel



Annex 6: Short Agenda (updated)

Session	Session title	Speakers and Panellists
23/11/2018. Day 1: A framework for transition.		
Which framing for the target setting for the post-2020 framework?		
9:00 <i>Opening</i>	<i>Opening address</i>	Alexander Shestakov, CBD Secretariat. Hiroyuki Takeda, IUBS President. Humberto Delgado Rosa, European Commission. Anne Larigauderie, IPBES Executive Secretary. Moderation: Marcos Regis da Silva, IAI Executive Director.
<i>Intervention of the COP Presidency</i>	<i>Welcome by the Host</i>	Speaker: Yasmine Fouad, Egyptian Minister of Environment
9:25 <i>Introduction</i>	<i>Aims and outputs of this dialogue</i>	What are the expectations from the CBD secretariat for this dialogue? Which process will benefit from this dialogue? Which outcomes would be useful? Lessons from the 2010 and 2020 policies on biodiversity and the need for a new vision, as well as what scenarios to 2050 can tell us. What are the options? What is necessary? How to make it happen? How to ensure action? The presentation will draw the path from Sharm el-Sheikh to Beijing. Speaker: David Cooper.
9:35 <i>Session 1 (panel & audience discussion)</i>	<i>Concepts for transition</i>	Setting the ground for broader understanding of transitions and the need for social-ecological transformations with views from key scientists. Bending the curve – how to come to the 2050 vision and new targets for the post-2020 agenda. What is the role that research should take? How to cope with uncertainty when designing and implementing urgent measures? How can NBS support the 2050 vision, and allow us to achieve biodiversity and development goals in a more coherent manner? What should our expectations and priorities be? Speaker: Josef Settele. Panel with Mundita Lim, Bernadette Fischler, Hesiquio Benitez. Moderation: Jorge Ventocilla.
11:15 <i>Session 2 (panel & audience discussion)</i>	<i>From the current to the future status of biodiversity</i>	What is the current state of biodiversity? How can we promote the role of integrated assessments and scenarios/models for policy making in the post-2020 process? What can research advance on devising and adapting the pathways? How to bring this into the post-2020 biodiversity discussion? Speakers: Henrique Miguel Pereira, Marcel Kok. Panel with Saneetha Subramanian, Melanie Heath, Bernardo Strassburg. Moderation: Jorge Ventocilla.
13:00	Lunch	
14:00 <i>Session 3 (work in groups)</i>	<i>Unfolding the 2050 biodiversity vision</i>	Starting from the CBD 2050 vision for biodiversity, how can we translate it into tangible terms regarding science, policy and society in regional and global levels? And after “painting the picture” of the future vision, what are the short and long-term actions that we need to undertake to reach it? Inputs from the speakers will provide an introduction for a participatory back-casting exercise, the results of which will provide input for session 4. Speaker: Bernardo Strassburg. Moderation: Zoi Konstantinou.
16:20 <i>Session 4 (work in groups)</i>	<i>Target setting for the post-2020 framework</i>	Translating the necessary actions to reach the 2050 biodiversity vision into target areas for the post-2020 framework: How can science help to make progress in the quantification and attribution/allocation of the targets? How can measurable indicators and actions allow us assessing progress towards these targets (and the 2050 vision)? This session looks closer at key areas for target setting: <i>a) Land (protection, retention, restoration); b) Ocean; c) Species; d) Direct drivers; e) Indirect drivers.</i> Speaker: James Watson. Panel with Neville Ash, Carolyn Lundquist, Günter Mitlacher, Roby Biwer. Moderation: Zoi Konstantinou.
18:30 <i>Wrap-up</i>	<i>Conclusions from day 1</i>	Marco Fritz, Lily Rodriguez, Marcos Regis da Silva.



Session	Session title	Speakers and Panellists
24/11/2018. Day 2: Increasing solutions for restoration (scaling-up nature-based solutions). Which transitions for transformational change? Implementation		
9:00 <i>Opening</i>	<i>Information on the programme</i>	Information from relevant sessions of parallel events (Summit of Local and Subnational Governments, Nature and Culture Summit, Sustainable Ocean Day). Introducing Consortium of Scientific Partners on Biodiversity. Speakers: Ingrid Coetzee, John Scott, Joe Appiott, Ana Maria Hernandez. Moderation: Miriam Grace.
9:30 <i>Session 5 (panel & audience discussion)</i>	<i>Scaling up: Nature-based solutions for restoration agenda and beyond</i>	This session informs on needs for research and policy setting on restoration to be taken further for giving multiple benefits beyond climate change mitigation, adaptation and biodiversity conservation and restoration. Can such nature-based solutions help achieving across the Sustainable Development Goals? Which challenges, opportunities and unresolved issues exist? Speakers: Judy Fisher, Harriet Bulkeley. Panel with Frédéric Lemaitre, Karin Zaunberger, Chantal van Ham. Moderation: Miriam Grace.
11:10 <i>Session 6 (panel & audience discussion)</i>	<i>Increasing resilient solutions for restoration</i>	Understanding the need for restoration and using nature-based solutions, including in urban settings, to reach biodiversity targets, on the example of Africa. Which are the recommendations of science for policy makers? What is the role that research should take? How to bring this into the post-2020 biodiversity discussion? What are the options? What can be done? Speakers: Hamdallah Zedan, Marwa Halmy. Panel with Judy Fisher, Eric Wikramanayake, Jesca Osuna Eriyo. Moderation: Miriam Grace.
12:30	Lunch	
13:30 <i>Session 7 (work in groups)</i>	<i>Uptake of actions towards the 2050 vision</i>	Understanding the frame in which the targets are set in the post-2020 agenda to prepare for the development of the post-2020 global biodiversity targets. Building on the results of the back-casting exercise of day 1 (sessions 3 and 4), participants will work towards connecting post-2020 targets with the Sustainable Development Goals and discussing challenges and opportunities in that context. Speakers: Jerry Harrison, Axel Paulsch. Moderation: Kristina Raab.
15:00 <i>Session 8 (panel & audience discussion)</i>	<i>Engaging Society, Science and Policy in transformative change</i>	Discussion on the needs from science in implementing social-ecological transitions. Where should future research focus on? How to engage various stakeholders? What are priorities for research and policy to advance transitions regarding social-ecological systems, biodiversity and benefits from nature? Speaker: Thomas Elmqvist. Panel with Dicky Simorangkir, Omar Defeo, Thomas Brooks, Daniel Vincente Ortega. Moderation: Kristina Raab.
16.30 <i>Synthesis</i>	<i>Wrap-up and next steps</i>	Meeting conclusions and recommendations suggested for the post-2020 process: Organiser. Ute Jacob. Follow-up: Ana Maria Hernandez, Andreas Schei. Moderation: Isabel Sousa Pinto.
18:00 <i>Closing panel</i>		Sameh H. Soror, Egypt, Academy of Scientific Research and Technology. David Cooper, CBD Secretariat.
18:30		End of Science Forum