CCICED Special Policy Study

Post-2020 Global Biodiversity Conservation

2021 Report

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Contents

Abbreviation List

Abbreviation	Full name
ABS	Access to Benefit Sharing
AoH	area of habitats
APT	ASEAN plus Three Cooperation countries
ArcGIS	ArcGIS
BfN	German Federal Agency for Nature Conservation
CBC	Community-based Conservation
CBD	Convention on Biological Diversity
CCICED	China Council for International Cooperation on Environment and Development
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties
CR	Critically Endangered
CSOs	Civil Society Organizations
EA	Ecosystem Accounting
ECRL/ECR	Ecological Conservation Redlines
EN	Endangered
GBF	Global Biodiversity Framework
GDP	gross domestic product
GIS	Geographic Information System
HAC	High Ambition Coalition
HoS/G	Heads of State/Government
HR	Heterotrophic Respiration
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
LPN	Leader's Pledge for Nature
LTAM	long-term strategic approach for mainstreaming biodiversity
MEAs	Multilateral Environmental Agreements
MEE	Ministry of Ecology and Environment
NbS	Nature-based Solutions
NBSAP	National Biodiversity Strategy and Action Plan
NEP	Net Ecosystem Productivity
NPP	net primary productivity
OECMs	Other Effective Area-based Conservation Measures
OEWG	Open-ended Working Group
OPS	One Planet Summit
SDGs	Sustainable Development Goals
SEEA	System of Economic and Environmental Accounting
SNA	System of National Accounts
SPS	Special Policy Study
TNFD	Taskforce on Nature-related Financial Disclosure
UNFCCC	UN Framework Convention on Climate Change
UNSG	UN Secretary-General
VU	Vulnerable
WBCSD	World Business Council for Sustainable Development
WEF	World Economic Forum
WHC	World Heritage Committee

Executive Summary

Research Context

The 15th Conference of the Parties to the Convention on Biological Diversity (COP15) will be held in Kunming, China in October 2021. The aim of the meeting is to formulate and adopt an ambitious post-2020 global biodiversity framework, which will be a milestone for global biodiversity conservation. This framework (GBF) should be based on the considerable body of knowledge, discussions and negotiations accumulated over the previous decade that has demonstrated an urgent need to reverse the current loss of biodiversity and ecosystem destruction. The 2021 to 2030 period is essential to set global efforts on a track robust enough to see turning points by 2030, restoration of many natural ecosystems during this decade and the next. The hope is to realize the vision of "living in harmony with nature" by 2050. The challenges are immense on these matters, but in China and many other countries innovation and cooperation extending across sectors, and synergies is shedding light on the opportunity of achieving green, low-carbon, fair and sustainable development..

Since 2018 this Special Policy Study (SPS) has been actively undertaking research on some key matters that might be incorporated into the new post-2020 global biodiversity framework (GBF) and political momentum, and mechanisms to build a solid basis for its support and early action. At the same time, we have highlighted some of the innovations China is undertaking, especially those drawing international attention such as ecological redlining. Our previous recommendations have been presented to CCICED Annual General Meetings (AGM) in 2018, 2019 and 2020.

There is momentum building towards a much higher level of global concern regarding nature for innovation and early commitment to action in the post-2021 period. Yet it still will take a tremendous effort to "bend the curve" of biodiversity loss by 2030. The transition and implementation efforts during the years immediately following COP15 are therefore of great significance. The efforts include an urgent need to address serious matters regarding funding gaps, and an ongoing need to build synergies among the multilateral environmental agreements and other initiatives directed to sustainable development. Significantly greater efforts are needed to address gender gaps and inclusion of indigenous people. CBD COP 15, UNFCCC and the UN Global Food Systems Summit[1], plus the on-going global efforts to build green recovery and resilience against events such as epidemics and pandemics are important ways to mainstream biodiversity into national and global decision-making. Furthermore, there must be continuous improvement and sharing of innovative technical approaches for biodiversity conservation globally from now on.

SPS 1-2 Post-2020 Biodiversity Conservation Current Research

Our current report covers following matters that we believe will be of high importance during COP 15 and in the years after.

Chapter 3 provides an overview of progress over the last 8 to 10 months Elevating the nature agenda and profile for national, regional and global policies to achieve an ambitious and transformational post-2020 global biodiversity framework still needs to be strengthened in current documents. This includes identifying promising topics related to maintaining high level momentum, analyzing the attention given to nature issues by Heads of State leaders as well as actions and initiatives of other stakeholders, and accelerating progress of the proposed GBF and possible implementation mechanisms after agreement on the COP 15 GBF is settled.

[1] https://www.cbd.int/agro/foodsystemssummit/

However, the global biodiversity agenda has accelerated rapidly since the UN Biodiversity Summit in Sept 2020 (and since we last submitted our SPS research report in September 2020). Many more world leaders are putting nature higher on their agenda and committing to reverse the loss of biodiversity. The momentum there is strong. These initiatives include the Leaders' Pledge for Nature, One Planet Summit, the leadership of the UN and the UNSG, the Food Systems Summit, the Ocean Coalitions, and individual country leadership.

The negotiation of the GBF is at a critical stage. The commitments and ambition made by global leaders need to be reflected in the negotiation process and final documents.

Chapter 4 examines how much protected area is needed, or might be feasible, and where it should be prioritized in the Asian region countries and compared globally. Based on scientific research and scientific data, the research team focuses on area-based conservation. It is necessary to set up an ambitious goal for the effective conservation of species, and different countries should bear common but differentiated responsibilities in biodiversity conservation. At the same time, new mechanisms are needed to achieve the expected conservation goals, such as the adoption of national voluntary commitments in the national biodiversity conservation strategy and action plan, and the provision of financial assistance to the less developed countries with major conservation responsibilities.

A spatial meta-analysis was conducted to identify global terrestrial Conservation Priority Zones (CPZs). Part of this effort has been published in peer-reviewed articles. Cost-Effective Zones (CEZs) were identified as CPZs within the Low Human Impact Areas, which were areas with biodiversity significance and less used by humans. The team suggests using the concept of Cost-Effective Zones to guide future conservation efforts, and provide regional scalable priorities for national biodiversity and carbon conservation planning in Asia. This approach is suggested in recognition of the various pressures created by large populations, disparities in national income and other factors that may affect the degree of effort available to address conservation needs. Ideally it will help to ensure efforts are prioritized to those most likely to be successful.

Chapter 5 determines the principles and procedures for optimizing Ecological Conservation Redlines (ECR), with special attention to carbon sequestration and other ecological service functions applicable to China and developing countries.

ECR serves as both a 'bottom line' and a 'lifeline' in safeguarding national ecological security. It usually covers areas with important ecological functions such as water conservation, biodiversity maintenance, soil and water conservation, protection in areas suffering from aeolian processes that lead to shifting sand dunes, dust storms and coastal ecological stability, and ecologically sensitive and vulnerable areas suffering from soil erosion, land desertification, rocky desertification and salinization. The ECR approach in recent years has been widely applied as a national policy in China, with considerable interest from various developing countries.

At present, China's provinces (and regions and cities) have applied this technology system and basically completed ECR delimitation. On the whole, China has delimited terrestrial ECR of 3.095 million km^2 accounting for 32.2% of the total land area. ECR area is mainly natural ecological land such as woodland, grassland, shrub and water wetland. The ecological functions of ECR include water conservation, soil and water conservation, biodiversity maintenance, protection from wind and sand fixation, etc., and water

conservation and biodiversity maintenance areas account for more than 75% and occupy the dominant position.

It is suggested to optimize the method for biodiversity maintenance evaluation in delimiting ECR, that is, based on the existing multi-parameter evaluation model, the data such as wildlife richness, ecosystem types, endemic species and threatened species are considered comprehensively to optimize the identification method of important areas of biodiversity conservation. The important areas of biodiversity conservation are taken as the basis for assessing the importance of biodiversity maintenance function.

ECR helps to reverse ecological degradation in forests, grasslands, wetlands and other ecosystems. But it could also support important carbon sequestration functions, and enhances carbon storage and carbon sequestration potential of ecosystems. Delimiting ECR of carbon sink function and implementing strict protection and ecological restoration can make important contributions to improving the ECR system, mitigating global climate change and helping to realize the vision of carbon neutrality. Applying the ECR delimitation method and management requirements for this purpose, requires considerable information: current status of terrestrial ecosystems, and the carbon sink status for typical ecosystems as the delimited objects. The evaluation index system of carbon sequestration importance is then established from the three dimensions of carbon storage, carbon sink and carbon sequestration potential. The system can be used to scientifically evaluate the carbon sequestration importance and reveal the importance and regional differences of carbon sequestration function. The terrestrial ecosystems with high carbon storage, strong carbon sequestration capacity and great carbon sequestration potential can be identified as the 'ECR of carbon sequestration function'.

ECR delimitation technology can be applied by means of GIS, computer information technology, etc. We are proposing to design an ECR software kit to integrate the methods and processes of ECR delimitation. On this basis, it can be used in other regions and countries for their reference. An ECR software kit can realize the integration of the methods and processes of ECR delimitation, which has independent data models, standards and methods, can assist in processing and producing basic data and parameters of ECR delimitation, calculate the importance of ecological service functions, establish the results of ecosystem classification, and finally generate the boundary of ECR.

ECR proposed by China innovatively plays a key role in maintaining national or regional ecological security and sustainable socio-economic development, and its strategic position is very important. ECR delimitation in China is an important measure to promote the construction of ecological civilization, the basis to optimize the land spatial development pattern, and the major innovation of ecological environment protection system of China.

At COP15, ECR should be highlighted and used to demonstrate not only how challenges can be met but also how new opportunities for economic and social wellbeing emerge. At present, China is the only country in the world to delimit ECR. With the help of CBD as an ecological platform, China should show the world its innovation and breakthrough in the ecological environment protection work, and elaborate the function of ECR in biodiversity conservation.

Chapter 6 examines how mainstreaming and synergy agendas related to the cross-cutting aspects of biodiversity noted in the GBF could be further strengthened with examples from several types of case studies (climate policy, urban context, financial sector, and national accounting frameworks). This part of the SPS analysis has been led by an initiative done in cooperation with the German Federal Agency for Nature Conservation (BfN). The major report produced from this analysis will be issued separately as well as the summary in this document.

Mainstreaming biodiversity across government and society as well as enhancing synergies among environmental and sustainable development agendas are key contributions to realizing a broader agenda for societal transformative change. To further detail the mainstreaming agenda, the CBD COP 14 decided to establish a long-term strategic approach for mainstreaming biodiversity (LTAM). LTAM can ensure the necessary ownership by providing autonomous organization conditions for actors in various departments. In this way, LTAM can formulate a process of how to further develop the mainstream agenda, rather than trying to define the contents of various aspects.

While biodiversity is still insufficiently anchored in relevant policy areas and sectors, there have been promising developments in climate policy, urban planning, the financial sector and environmental accounting. In all four areas, it is a broad coalition of, among others, economic, political and civil society actors that has enabled initial mainstreaming successes. In the urban sphere and climate policy, the integration of biodiversity is increasingly framed using the concept of Nature-based Solutions (NbS). In order for NbS to actually contribute to the conservation of biodiversity and its sustainable use, safeguard measures must be taken. This will ensure that biodiversity objectives are considered in the implementation process and are not inappropriately subordinated to climate and urban planning objectives. At the same time, NbS should not only be understood as measures that contribute to climate action but for all societal challenges as defined by IUCN, including health, provision of food and clean water, natural habitat degradation and natural disaster prevention.

We put forward the entry points of "framework" to strengthen biodiversity mainstreaming in climate policy, urban context, financial sector and national accounts. We need to take the "framework" as an opportunity to strengthen international biodiversity collaborative governance by playing a synergistic role.

Chapter 7 identifies current status and needs for improving social-ecological security and resilience related to global environment emergencies while also dealing with COVID-19.

The crisis created by the Coronavirus (SARS-CoV-2) spreading COVID-19 disease world-wide reminds us once again that even the smallest forms of biodiversity can bring about devastating impacts for people, our globalized economies and society. COVID-19 came on suddenly, but may leave only gradually. This topic is covered in a longer report we have already released as a second draft Working Paper on the COVID-19 pandemic as perceived from an ecological and environmental perspective. An important part of the document, as our societies continue to learn how to deal with the virus, is how to mainstream relatively new ideas such as taking a One Health integrated approach. This concept links Human Health, Animal and Plant Health, and Ecosystem Health. It is a topic that deserves a good airing at COP 15.

‘Building back better’ has become a global rallying call for a more resilient planet, communities and economies. These terms, however, are far from being well defined. One way to do so is to break them into understandable terms: financing and resilience are two examples.

According to various published sources USD 14.6 trillion was committed to stimulus and recovery in 50 large economies during 2020. And the numbers keep rising since then. Most funding was spent on 'first aid' stimulus initiatives intended to avoid economic and public health disasters. Only USD1.9 trillion was allocated to longer term 'recovery-type measures'. Of this smaller amount, USD 341 billion supported green recovery initiatives—less than 18%. The countries providing green support were almost exclusively among the richer nations. The EU has based its recovery efforts around the *2019-2024 European Green Deal* and is an exception to the general trend of some other countries and regions. The USA awaits action by the new administration. China is bundling its green efforts into relevant parts of the 14th Five Year Plan. The funding gap on biodiversity matters is estimated at an average of USD 711 billion per year this decade. In 2019 biodiversity conservation global financing was estimated at USD 124 to 143 billion. This should be a matter of concern at both CBD COP 15 and at the UN Climate Change COP 26.

Green recovery is perhaps our bridge to a more resilient future. Engineering resilience refers to how long it takes for the inspected object to return to its steady state after being disturbed. Ecological resilience refers to the various states of an ecosystem under pressure, rather than assuming that it may return to a stable state. IUCN defines resilience "as the capacity of a system to recover from stress and disturbance while retaining its essential functions, structure, feedbacks and identity". Adaptability is capacity of human/biological actors to influence resilience; transformability is capacity of actors to create a fundamentally new system when social-economic or ecological factors make the existing system untenable. We are left with four questions about resilience that deserve to be considered in the discussions at CBD COP 15 and even more during the design of COVID-19 green recovery initiatives, and in the design of projects for sustainable development, food security, and One Health initiatives: (1) Can resilience be defined in an integrated fashion? (2) Can resilience be measured and monitored for success? (3) How can resilience be linked meaningfully to scale, sustainability or other objectives and outcomes? (4) Should we find more precise language than this term?

Gender equality is essential to the discussions at CBD COP15 and this is a subject where a lot of effort has been placed in recent times. We urgently need to make gender equality a main goal of biodiversity conservation and ecosystem restoration. National plans must incorporate and act on gender equality needs in a more effective way. In general, we must regard gender equality as an excellent opportunity and take action on this basis to promote a new, more precious and harmonious relationship between all mankind and nature. Similarly, we need to place greater emphasis globally on the wisdom, and traditional resource and environmental knowledge of indigenous people. Tribal people often have faced great challenges and, as noted by the UN *Declaration on the Rights of Indigenous Peoples*, special attention is needed to meet their needs, often linked to sustainable use of ecosystems and natural resources.

Chapter 8 Recommendations. Over the past three CCICED Annual General Meetings the Special Policy Study on Post-2020 Biodiversity Conservation and Actions has presented recommendations relating to COP 15 and to China's impressive efforts for improving and restoring ecological services and restoration, and biodiversity protection. Now, as COP 15 draws near, we particularly wish to look at some ways to ensure there is effective and rapid implementation of the GBF once agreed at the Kunming meeting. China has much to contribute at this meeting and in the years after. As the host country and the president of COP15, China's role before, during and after the Kunming conference are crucial. We put forward some suggestions

to improve the "framework" and strengthen its implementation. As a separate appendix we also make some suggestions regarding revisions to the "framework draft" (draft 0.5).

Recommendation 1

Strive towards highly effective implementation of the GBF 2021-2025. The first several years of implementation are a make-or-break period to overcome the challenges identified regarding Aichi failures and implementation difficulties of the Paris Climate Change Agreement, and the UN 2030 Sustainable Development Goals. Ways to do so include the following major points.

- **Every goal and target at global and national (NBSAP AND NDC) levels is well supported by credible and operational indicators to assess progress and to make any necessary corrections quickly.** Use the UN SEEA ecosystem and environmental accounting where possible to build compatibility regionally and globally. Assessment should also take into account linking biodiversity progress with selected UN SDGs.
- **Enrich efforts to mainstream biodiversity and build synergies, especially among multilateral environmental agreements (MEAs) including climate change, in rural vitalization and green urbanization initiatives, and major integrated and regional development programs.**
- **Work cooperatively to explore and promote on a much larger scale the use of nature-based solutions and nature-positive economic and social development.** This approach should not be limited to climate/biodiversity initiatives, and should become part of portfolios supported by governments, international development banks, local and regional commercial banks and other investment sources, private sector enterprises, and community-based organizations.
- **Link biodiversity and ecosystem science more strongly to public policy formulation, and to broader economic and social values such as those related to needs of indigenous people, conservation economics, circular economy, poverty reduction, removal of perverse subsidies, and alternative measures of assessing societal wellbeing.** These types of transformative thinking are already demonstrating their usefulness. They fit well with the Ecological Civilization and sustainability theme of CBD COP 15. However, transitions must be accelerated early on if we expect major transformations by 2030 and beyond are to be successful.
- **Build a stronger case for dovetailing more funding linked to a green recovery from COVID-19 including support for biodiversity-related needs.** The clearest case to be made is for adoption of a One Health approach in all countries for meeting plant and animal health needs and disease prevention while also investing in ecosystem health and human health. This provides the added benefit of reducing future risks of epidemics and pandemics.
- **Place more emphasis both before and immediately after COP 15 on the 'Long-Term Action to Mainstream Biodiversity' within and across sectors.** This is noted by IPBES to be essential. The role of enterprises, private sector finance, technological shifts, etc., will be drivers of change. There is good buy-in by some bodies such as the World Economic Forum (WEF) and The World Business Council for Sustainable Development (WBCSD) and a growing number of political leaders, groups such as C40 cities, etc., but far too many decisions still neglect/undervalue biodiversity and ecological services.

Recommendation 2

Call for further high-level political engagement and translation of ambition into action. As the host country of COP 15, China has the opportunity to play a leading role in reinforcing determination and ambition at a global level to meet the goal of building a new relationship between people and nature. China could also consider to join other global leaders such as the UNSG or the Leader's Pledge for Nature, at an appropriate time such as UNGA76, CBD COP 15, G20, or UNFCCC COP 26. .

China could call for a Head of State side event before COP 15 drawing together the themes of triple global emergencies of biodiversity, climate and pollution. Such an event could also be linked to the need for global green recovery from COVID-19. Call for, or join with other leaders, a Summit of Three Rio Conventions, to set a solid foundation for the implementation of all three Rio Conventions (UNCCD, UNCBD, UNFCCC) during the Decade of Restoration. Call for nature-based solutions linking China's great efforts over several decades on food, biodiversity, ecosystem recovery, and health, and its more recent ambitions regarding carbon neutrality.

To get a GBF that is ambitious and can bring the needed changes to be nature positive in the next decade, bilateral engagement at HoS/G, ministerial, diplomat and negotiators levels are all critically needed.

In the process of GBF negotiations, China, as the host country, has the opportunity to lead key issues such as "biodiversity mainstreaming", "financial mechanism", and promote the effective implementation of biodiversity mainstreaming and GBF based on China's own experience and practices.

Recommendation 3

- **Share the experience of ecological function zoning in China with other countries**
  China's ECR can be introduced to other countries as a major innovative practice of protecting biodiversity and safeguarding national ecological security. At present, China is the only country in the world to carry out comprehensive and systematic national territory spatial planning, through which most special ecosystems and biodiversity-rich regions can be protected. With the help of the Convention on Biological Diversity COP15 meeting, China can introduce this to other countries and discuss the mechanism to benefit from this innovative practical for other countries. The key ecological function zones of carbon sink are incorporated into the work of responding to climate change as other methods of Nature Based Solution. Biodiversity conservation and climate change initiatives have many synergies. Changing the value of land use to obtain more carbon sinks will not only help combat climate change, but also ensure the benefits of biodiversity. According to the current ECR delimitation results, only about 45% of the important carbon sink ecological function areas are covered in ECR. If more of these areas can be protected through ECR, it will help China achieve the goals of peaking carbon dioxide emissions and carbon neutrality. China's practice in carbon sink can also be of great reference value to other countries. On the climate change summit of the 74th UN General Assembly, the Chinese government submitted to the General Assembly the action initiative of "delimiting ECR, to mitigate and adapt to climate change—natural based solutions". It is suggested that follow-up action should be taken to this proposal, especially calling for some global conventions, international organizations, non-governmental organizations and the private sector to arrange some pilot projects to learn from China's experience.

Recommendation 4

Accelerate work towards social-ecological security, resilience, and gender equality for the health and wellbeing of all people on our One Planet.

The following five suggestions cover strategic matters that together will help to bend the curve from biodiversity catastrophe in 2030 to a solid road for recovery. (1) 'Building Back Better' must incorporate a strong social-ecological approach based on improvements for both people and nature at all levels from local to planetary. (2) Worthwhile concepts such as ecological and social resilience are backed by scientific reasoning, but to be fully operational require a much better basis of data collection and indicators for monitoring progress towards sustainability. (3) Spark innovation on many fronts to enhance biodiversity conservation plus ecological services and restoration. (4) Build stronger partnerships with development

organizations and investors already deeply engaged in green recovery, green development and green growth.
(5) Make gender equality a leading objective for biodiversity conservation and ecosystem restoration.

1. Background

The month of September 2020 became an historic moment when Nature registered high on the political agenda of global leaders. *"We will protect our planet*" became a call of governments in their United Nations (UN) 75th Anniversary Declaration（UN, 2020）.124 member states participated and at least 65 heads of state and government (HoS/G) spoke at the first ever UN Summit on Biodiversity with such a level of attendance (CBD Secretariat, 2020b）.Together with representatives of business, international organizations, finance institutions, scientists, civil society, youth, indigenous peoples and local communities, parliamentarians and local government, political leaders have sent clear messages that immediate and stronger actions are needed to reverse biodiversity loss and put nature on a path to recovery during this decade. COVID-19 has disrupted the scheduling of major international meetings planned for late 2020, including the 15th Conference of Parties (COP) of the Convention on Biological Diversity (CBD) and the UN Framework Convention on Climate Change (UNFCCC) COP 26 by a year. The year 2021 is now *de facto* the Super Year of Environment.

Without question, we are facing the need for a critical 'super decade of action' for achieving the UN Sustainable Development Goals and for addressing the climate change and biodiversity crises — plus 'green recovery' from the Covid-19 pandemic. The UN General Assembly has designated 2021-2030 as the UN Decade on Ecosystem Restoration. The decade should become a stepping stone to a new green global economy that will help to build a more harmonious relationship between people and nature in all parts of the world by mid-century. We see examples emerging, such as commitments for nature-based solutions (NbS) to climate change. The *Leaders Pledge for Nature* (Leaders' Pledge For Nature， 2021）(heads of state and government level) is calling for reversing nature loss by 2030 for sustainable development, leading towards a nature-positive future. This will require business, communities, and organizations of all types as well as governments (national and local) to take actions all together, for carbon neutral, nature positive, clean and green economic development, for substantial decoupling from today's energy and resource use levels to allow for building an equitable and sustainable future worldwide.

China sent a clear and bold signal to the world with its September 2020 UN announcement that it will strive to become carbon neutral by 2060. China has the opportunity to communicate and give signals on its ambition on nature, ahead of the rescheduled CBD COP 15 meeting that will take place in Kunming in October 2021. The theme is *Ecological Civilization: Building a Shared Future for All Life on Earth*, capturing the need for transformative changes and strengthened international cooperation. China's new 14th Five Year Plan (2021-2025) includes major commitments in its drive to build a 'Beautiful China' in 2035 with realization of Ecological Civilization through green development, environmental protection and ecological improvements. This period could also be a time for China to strengthen its National Biodiversity Strategy and Action Plan (NBSAP). China is deeply engaged in ecological restoration that may well serve as an important source of knowledge and innovation for other developing countries.

This China Council for International Cooperation on Environment and Development (CCICED) Special Policy Study (SPS) has made annual recommendations since 2018 emphasizing the need for a highly ambitious agenda at the CBD COP 15, including development and acceptance of a new post-2020 global biodiversity framework (GBF), and building a solid basis for its support and accelerated early action. Also, we have highlighted some of the innovations China is undertaking, including those drawing international attention such as ecological redlining. Over this 2018-to-2021-time period we have seen international momentum build towards innovation and early commitment to action in the post-2021 period, plus better understanding of the tremendous effort required to "bend the curve" of biodiversity loss to be nature positive by 2030. The transition and implementation efforts during the years immediately following COP15 are of

great significance. Furthermore, there is urgent need to address serious matters regarding gender gaps, funding gaps, and the ongoing need to build synergies among the multilateral environmental agreements and other efforts directed to sustainable development. CBD COP 15, UNFCCC and the UN Global Food Systems Summit, plus the on-going efforts to build green recovery and improve resilience against events such as epidemics and pandemics are important ways to mainstream biodiversity into national and global decision-making.

China will remain as the CBD COP President past 2021 until COP 16. During this time, China can give full play to the role of the president country, perhaps by promoting international biodiversity governance to a new level. Rapid transitions will need to be initiated at multilateral, regional and national levels for the implementation of the GBF. Such measures will need to involve many other sectors beyond environmental institutions and ministries. Countries and the international community also must take mid-term and long-term approaches to improve relationships between people and nature. There will be important opportunities to do so in this post CBD COP 15 period.

In recent months our CCICED SPS has turned its focus towards examining some of the key planning matters still remaining before October 2021 and for the implementation of the GBF in the years immediately afterwards. The year-long postponement of the COP 15 has allowed groups to build new insights for biodiversity and ecological conservation. There is also a better sense about how a green recovery from COVID-19 might help with biodiversity and ecological improvements. Landmark studies on the economics of biodiversity have been completed, and excellent analysis is available concerning ways to link climate mitigation and adaptation to nature based and nature positive solutions in order to develop win-win situations. Originally suggested for linking climate change and biodiversity, NbS can address other societal challenges including human health, food and water security, natural disasters and biodiversity loss (IUCN, 2021).

The current report covers a range of matters that we believe will be of high significance during COP 15 and in the years after. There are five main topics covered (see Chapter 2), each described in a short chapter (Chapters 3-7). More detailed research reports arising from most topics are available. Since the work of this SPS is carried out in real time leading up to CBD COP 15, it is also possible that some studies will be updated as necessary in the months prior to the Kunming event. Chapter 8 presents summary recommendations of general significance.

2. Research objectives

The goals of the 2021 research for CCICED SPS 2-1 are to:

(1) Identify promising topics related to maintaining high level momentum and accelerating progress towards 2030 under the proposed GBF and possible implementation mechanisms after the GBF is agreed in COP 15 in Kunming (Chapter 3);

(2) Examine how much protected area is needed, or might be feasible, and where it should be prioritized in the Asian region countries and compared globally (Chapter 4);

(3) Determine principles and procedures for optimization of Ecological Conservation Redlines (ECR) for specific purposes such as carbon sequestration for use in China and developing countries (Chapter 5);

(4) Provide recommendations on how mainstreaming and synergy agendas related to the cross-cutting aspects of biodiversity noted in the GBF could be further strengthened with examples from several case studies (climate policy, urban context, financial sector, and national accounting frameworks) (Chapter 6); and

(5) Identify current status and needs for improving social-ecological security and resilience related to global environment emergencies while also dealing with COVID-19 (Chapter 7).

The research co-team leaders have prepared the resulting work according to their own approaches. Thus the main source of integration is in the recommendations (Chapter 8) which has been developed through consultation among the Co-team Leaders. We are grateful to the German Federal Agency for Nature Conservation (BfN) Team under Dr. Beate Jessel and Lennart Kümper-Schlake who produced a major report for the SPS which has been summarized in Chapter 6. The Co-Team Leaders appreciate the contributions and comments from other international experts.

3. Elevating nature agenda for an ambitious and transformational post-2020 global biodiversity framework GBF)

Covid-19 Pandemic has made it clearer than ever that nature plays a pivotal role in our health, society, and economy. Facing planetary emergencies, expressed as intertwined climate, biodiversity, and human health crises, the challenges are daunting. But people and leaders are waking up to them.

Recent research by the Economist Intelligence Unit (EIU) found that hundreds of millions of people across 54 countries globally share a rising concern about nature（Antonia Kerle, 2021）. To date in 2021, 89 heads of state and government signed the Leader's Pledge for Nature committing to reverse nature loss by 2030. We also witnessed for the first time that the G7 puts nature alongside climate change at the heart of their agenda. We must now harness this 'eco-awakening' and these high-level commitments to ensure the critical actions needed for climate and nature, and to translate these commitments and call-to-actions into national efforts and actions in global decision making. This once in a decade opportunity is to translate these commitments into an ambitious and transformational post-2020 global biodiversity framework to be agreed upon as the most important outcome of the CBD COP15.

3.1 High level movement analysis on global nature agenda

The global biodiversity agenda has accelerated rapidly since the UN Biodiversity Summit in Sept 2020 (and since we last submitted our SPS research report in Nov. 2020). More and more world leaders are putting nature high up on their agenda and commit to reverse the loss of biodiversity. The momentum is strong. While China is implementing Ecological Civilization thoughts in its national policy and actions, it is time for China to consider joining the global collective leadership. China could play a critical leadership role through either its own high level initiatives on biodiversity at global level or building on the existing global leadership initiatives. The following sections provide up-to-date observations on the biodiversity leadership at global stage.

1. Leaders' Pledge for Nature

Global leaders have made 10 Commitments[2] to take urgent actions to reverse the loss of nature and to achieve sustainable development goals by 2030 in their Leader's Pledge for Nature (LPN). The LPN has

[2] Ten commitments from the Leaders' Pledge for Nature include:
1. Supporting an ambitious and transformational post-2020 global biodiversity framework;
2. Integrating actions to tackle inter-linked environmental challenges;
3. Mainstreaming biodiversity across government and sectors;
4. Transitioning to sustainable patterns of production & consumption and sustainable food systems;
5. Reducing pollution on land, in water and in the air;
6. Sustainably managing our oceans;
7. Promoting a One Health approach;
8. Jointly putting biodiversity, climate and the environment at the heart of COVID recovery strategies and fostering a green

by now (July 2, 2021) been endorsed by 89 world leaders, covering Heads of State and Government (HoS/G) from 88 countries and the President of the EU Commission. The LPN represents 37.45% of world gross domestic product (GDP) and over 2 billion people (a quarter of the world population) across 6 regions (Africa, LAC, Asia Pacific, Europe, Middle East, North America), and including 8 biodiversity rich countries[3] (i.e., Like Minded Megadiverse Countries).

Female leaders have shown their leadership in the process as the percentage of them endorsing the Leaders' Pledge for Nature (13%) is higher than the average composition of female leaders across all countries (11%). A total 12 out of 23 female leaders (57%) endorsed the Pledge.

2. One Planet Summit

Leaders from 13 countries and the European Union Commission, including China's Vice Premier Han Zheng, plus 11 leaders from financial institutions, civil society organizations (CSOs) and banks joined French President Macron at the One Planet Summit (OPS)[4] on January 11, 2021. These leaders reiterated the importance of nature to people and health. At the OPS,

- France and Costa Rica launched the High Ambition Coalition (HAC, 2021) gaining 57 country's support to advocate for protecting at least 30% of terrestrial and marine spaces by 2030.
- A multi-stakeholder initiative "Great Green Wall Accelerator" was launched, with partners pledged $16.85 billion in international finance from 11 countries by 2025.
- The Natural Capital Investment Alliance was announced, intended to bring together $10 billion for nature by 2022.
- The Taskforce on Nature-related Financial Disclosure (TNFD) has gained political momentum. This initiative, promoted by public and private stakeholders, including around 50 leading financial institutions, will develop a framework for measuring the risks, impacts and benefits of economic activities with regard to biodiversity. In June 2021, major financial institutions and multinational corporates endorsed the launch of the TNFD, which will support business in assessing emerging nature-related risks and opportunities. Finance ministers from the Group of Seven (G7) of the largest economies have endorsed the launch of the new Taskforce on Nature-related Financial Disclosures (TNFD).
- UK and French committed to earmark 30% of their overseas public climate funding to nature-based solutions.

These and many other action commitments (Action Commitments For Biodiversity，2021) made at the OPS showed encouraging signs of concrete actions to be taken by the world leaders.

3. Leadership of the UN and the UN Secretary General

The UN Secretary General (UNSG) is championing the health, climate and nature agenda. In his speech on the State of the Planet in Dec. 2020, the UNSG pointed out that "humanity is waging war on nature" and

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and resilient recovery;

9. Stepping up resource mobilisation (more support to biodiversity and nature-based solutions, including eliminating or repurposing harmful investments and subsidies and aligning financial flows to environmental commitments and SDGs);
10. Supporting high climate ambition.

https://www.leaderspledgefornature.org/Leaders_Pledge_for_Nature_27.09.20.pdf

[3] Bolivia, Colombia, Costa Rica, Ethiopia, Guatemala, Kenya, Mexico, and Peru

[4] https://www.oneplanetsummit.fr/en/news-17#node-anchor-157

called out to "make peace with nature" by not only "resetting the world economy" after COVID, "but to transform it"（Guterres, 2020）. Subsequently, UNEP released a report on Making Peace with Nature to tackle climate, biodiversity and pollution emergencies. These notions should and can be reflected in the GBF and inspire actions taken by countries（UNEP, 2021）.

4. Food Systems Summit

Agriculture and food systems have a very significant environmental footprint on the world, using 34% of land, 69% of freshwater, and generating around 24-30% of greenhouse emissions. The 70% of biodiversity loss is due to the food sector. Yet around 33% of all food is wasted! How we produce and consume food is the biggest driver of biodiversity loss.

In late 2021, the UNSG will convene the first UN Food Systems Summit[5] as part of the UN Decade of Action to achieve the SDGs by 2030. The Summit will gather game changing actions to deliver progress on all 17 SDGs. The summit will bring together key players from the worlds of science, business, policy, healthcare and academia, as well as farmers, indigenous people, youth organizations, consumer groups, environmental activists, and other key stakeholders. The following five actions trackers are all critical to the achievement of SGDs and building a carbon neutral, nature positive and equitable future: ensuring access to safe and nutritious food for all; shifting to sustainable consumption patterns; boosting nature-positive production at scale; advancing equitable livelihoods; and building resilience to vulnerabilities, shocks and stresses. The outcomes of the Food System Summit should provide an innovative outlook on how to address the world's food system for use at other key decision making fora.

Food systems are not only the greatest drivers of biodiversity loss globally but also the biggest drivers of biodiversity loss in China[6]. This is also an opportunity for China to coordinate domestic efforts and actively participate in the global integrated efforts through combined decisions and initiatives in food, biodiversity, climate and health fields. China's global efforts should be built on China's great efforts and achievements on poverty alleviation, food security, as well as carbon neutrality and biodiversity conservation that China is striving to achieve. This will be an excellent opportunity for China to tell the 'China Story' to a global audience.

5. Ocean coalitions

Two thirds of global gross marine products rely on a healthy ocean. The ocean economy's annual value is estimated to be as much as $3 trillion by 2030 (Jolly, 2016). Ocean can absorb 30% of anthropogenic CO2 emissions. 500million people depend on coastal resources for food. And 89% of fish are overfished or at maximum capacity due to resource exploitation by humans.

There is no healthy planet without healthy oceans. And yet, the global attention to oceans has not been sufficient. Amidst both opportunities and challenges, world leaders are organizing for actions.

- 14 world leaders[7] initiated the High Level Panel for a Sustainable Ocean Economy in December 2020, to build momentum for a sustainable ocean economy in which effective protection, sustainable production and equitable prosperity go hand in hand.
- The Global Ocean Alliance[8] and its current 39 members, support 30% marine protection target,

[5] https://www.un.org/en/food-systems-summit

[6] http://www.fao.org/3/ca4831zh/ca4831zh.pdf

[7] The 14 Ocean Panel countries include: Australia, Canada, Chile, Fiji, Ghana, Indonesia, Jamaica, Japan, Kenya, Mexico, Namibia, Norway, Palau and Portugal

[8] There are currently 39 members in the Global Ocean Alliance: Australia, Belgium, Belize, Benin, Cabo Verde, Cambodia, Canada, Chile, Costa Rica, Croatia, Denmark, Ecuador, Fiji, Finland, France, Gabon, Germany, Guatemala, Honduras, Italy, Kenya, Luxembourg, Maldives, Mauritania, Monaco, Nicaragua, Nigeria, Palau,

which contributes to the High Ambition Coalition (HAC)'s 30% protection target for both marine and terrestrial. The chairs of the HAC, Costa Rica and France, are members of the Global Ocean Alliance.

These actions provide opportunities for the world to address the combined climate, biodiversity and pollution crisis with integrated solutions, recognizing the key role the ocean plays.

6. Country Leadership

The UK, host country of UNFCCC COP26, has indicated in its policy paper *Global Britain in a Competitive Age: the Integrated Review of Security, Defence, Development and Foreign Policy*（Cabinet Office, 2021）their determination to prioritize tackling climate change and biodiversity losses in 2021 and beyond. This determination comes with political leadership, financial commitments, and national actions such as commitment to protect at least 30% of its land and sea to support nature recovery. The UK's priority actions will be, among others, to reverse biodiversity loss by 2030, delivering goals and commitments set by the Paris Agreement, the CBD COP 15 outcome, and the 2020 Leaders' Pledge for Nature. The UK also has expressed strong willingness to work with China in tackling transnational challenges. This is a wide-open opportunity for China to seek collaboration on areas of high moral ground and common interest which are in line with the interests of both China and the world, avoiding or mitigating other geopolitical disagreements.

All three Rio Conventions, UN CCD (United Nations Convention to Combat Desertification), UN CBD, UNFCCC, are critical to deliver the UN Decade of Actionfor sustainable development and UN Decade of Ecosystem Restoration (UN, 2021a, b). French President Macron proposes a Summit in NYC in 2021 ahead of the three COPs to give them the needed push for decisions and tangible results[9]. He called for the mobilization of the international community at the highest level to deliver, for the first time, a message of common ambition (Macron, 2020）

The UN General Assembly decided on May 20, 2021 that an International Meeting entitled "Stockholm+50: a healthy planet for the prosperity of all – our responsibility, our opportunity" will be held in Stockholm, Sweden on June 2-3, 2022 (UN, 2021c). This will be during the week of World Environment Day, to commemorate the 50 years since the UN Conference on the Human Environment and the establishment of UNEP. This will be a critical moment for humanity to collectively look back humanity's half century efforts on the environment and start the strongest implementation of international agreements, such as the GBF that would be agreed before that.

7. China is stepping up its leadership on biodiversity at the global stage

Over the past few months, China has significantly increased its high-level global outreach with regard to global collaboration on biodiversity and CBD. China has led or jointly led the organization of several ministerial and higher-level meetings on biodiversity, CBD, and other related topics starting in May 2021.

1) On May 20, 2021, China's Minister of Ecology and Environment (MEE) hosted the "All for One, together towards Kunming" (MEE, 2021) online Ministerial Roundtable with his counterparts from Brazil, Colombia, Costa Rica, Egypt, Ethiopia, the European Union, Germany, India, Japan, Singapore as well as Madam Amina Mohamed, Deputy Secretary-General of UN and other senior representatives from UNDP, UNEP, FAO, Secretariat of CBD,

Panama, Portugal, Senegal, Seychelles, Spain, St Kitts and Nevis, Sweden, Togo, United Arab Emirates, United Kingdom and Vanuatu.

9 https://www.elysee.fr/emmanuel-macron/2020/09/22/declaration-du-president-emmanuel-macron-pour-la-75e-session-de-lassemblee-generale-des-nations-unies

Secretariat of UNFCCC, and Secretariat of UNCCD. Both the CBD Executive Secretary Ms. Elizabeth Maruma Mrema and UNEP Executive Director Inger Andersen delivered their remarks calling for Kunming as an essential springboard towards a sustainable future and "*inspiring the deep transformations we need, with the full and active engagement of all stakeholders, to shift course and recalibrate our values and actions to attain our 2050 Vision of living in harmony with nature*".

MEE Minister Huan Runqiu emphasized that "*adhering to systematic governance, [China] has implemented major programs for biodiversity conservation and ecological protection and restoration, and promoted the integrated protection and restoration of mountains, water, forests, fields, lakes, grasses and sands. The innovative spatial planning system and strict adherence to the ecological protection red line have effectively protected more than 25% of the terrestrial national land."* He continued, emphasizing that: *"Firstly, we must insist on practical cooperation and share the mission. We should formulate an ambitious and practical framework, take into account the three major objectives of the Convention, draw on the experience of the Aichi Targets, and set scientific and reasonable objectives and tasks. Secondly, we must adhere to the priority of conservation and green development. Uphold the concept of respecting nature, responding to nature and protecting nature, support nature-based solutions, promote ecosystem protection and restoration as a whole, and unswervingly take the road of ecological priority and green development. Thirdly, we must insist on increasing investment and strengthening support. All parties are expected to uphold the concept of a community of life between human beings and nature, and from the common interests of all mankind, continue to increase investment, take the initiative to mobilize more resources for biodiversity conservation and sustainable use, and provide more financial support. Fourth, we should adhere to the cohesion and move forward together."*

2) Ahead of the International Day for Biological Diversity Day on 21 May, 2021, the Permanent Mission of the People's Republic of China to the United Nations, jointly with the Convention on Biological Diversity, and the UN's Food and Agriculture Organization (FAO) Liaison Office in New York, organized a virtual event with a theme "COP15: Road to Kunming, Building a Shared Future for All Life on Earth" (FAO, 2021). The UNSG reiterated that
"our *efforts to protect biodiversity will be key*" to utilize "*this landmark year*" to "*restore balance with nature, tackle the climate emergency and get ahead of the pollution crisis*".

The President of the UNGA made remarks that with efforts "*building on last year's Biodiversity Summit and the launch of the Leader's Pledge for Nature, and with efforts underway on a post-2020 global biodiversity framework, we have a very real opportunity to 'bend the curve' on nature".*

The Chinese Ambassador to the UN noted in his speech that "*We need to work for the adoption of a comprehensive, balanced, ambitious and implementable post-2020 framework of action at COP15".*

The UK's permanent representative to the UN, said both President Xi Jinping and the UK's Prime Minister Boris Johnson have agreed that the two countries have a collective responsibility to tackle the issues of climate change and biodiversity loss. "*I look forward to working with all delegations toward the two COPs, and continuing the conversation with China to ensure a mutually-supported outcome*," she said, in reference to the 26th UN Climate Change Conference of the Parties (COP26), which will be hosted by the UK.

About 200 attendees, including more than 30 ambassadors from various UN member states, including Egypt, Colombia, Antigua and Barbuda, European Union, Brazil, United Kingdom, Norway, Costa Rica, Fiji, Russia, Turkey, India and Germany, joined discussion.

3) On May 21, 2021, the Secretariat of the CBD and the Ministry of Ecology and Environment (MEE) of China, jointly organized a meeting themed "COP15: Road to Kunming: We are part of the solutions #ForNature". The chief negotiator from the Foreign Ministry of China on climate change, Ambassadors of EU and Egypt to China, the Head of UNDP China joined Chinese Environmental Minister to celebrate the International Biodiversity Day on 21 May. Liu Zhenmin, deputy Secretary General of the UN and the Executive Secretary of CBD sent their videos. The EU Ambassador Chapuis called for an ambitious and realistic GBF. He also expressed his concerns whether the NGOs participation at COP15 would be limited due to the epidemic control.

4) On May 25th, at the UN Environment Management Group's Virtual dialogue on UN system's support to the Global Biodiversity, Chinese CBD Chief Negotiator Mr. Liu Ning briefed the participants across the UN system about the progress and achievement of China's ecological conservation, China's preparation of the COP15, and calling for the need of gathering "the highest level of political wisdom" for agreeing with and implementing effectively "a comprehensive, widely-participated, transformative, ambitious and practical post-2020 GBF".

5) On June 4th, China co-hosted "The Road from Sharm El-Sheikh to Kunming – Restoration in the Post-2020 Global Biodiversity Framework", a high-level panel event[10] for the United Nations Decade on Ecosystem Restoration, jointly with the Secretariat of the Convention on Biological Diversity, with the Governments of Egypt, and the Korea Forest Service.

   MEE Minister Mr. Huang Runqiu shared China's willingness to "*promote (global) high-level political momentum for the post 2020 GBF and enhance the ambition of ecosystem restoration globally*". He calls for that "*facing the grim situation of global ecological and environment governance, the international community should uphold unprecedented ambition and action to explore a path of harmonious coexistence between human and nature, and protect the nature and the environment like protecting our eyes, so as to have sound ecosystems to support the sustainable development of our economy and society*."

   He proposed: First, to put ecosystem restoration at the core of policy making, increase financing for nature by public and private sectors, and drive the flow of resources to ecosystem restoration. Second, to adopt and enhance a systematic approach to ecosystem restoration, adhere to the concept that mountains, rivers, forests, lakes, grasslands, and deserts form a community of shared life and conduct overall protection, systematic restoration, comprehensive management, coordinated planning and integrated implementation. Third, to improve the quality of ecosystem restoration, give full consideration to the characteristics of different ecosystems, adhere to the principle of nature restoration as the mainstay and artificial restorative intervention as a supplement, manage and restore ecosystems according to local conditions, and constantly improve the quality and resilience of ecosystem restoration. Fourth, to establish a diversified resource mobilization mechanism.

We have observed that domestically in China, many originally planned in person parallel fora of the CBD COP15 have been executed with a combined on-line and in person meetings to continue the communications of the biodiversity to wider audience and keep the momentum towards the COP15.

In addition to official players, there are various active non-governmental and non-state actors playing a pivotal role in elevating ambition and mobilizing resources, and effective implementation of the global agreements. It will be very helpful for China to engage with these organizations that have nature and biodiversity at the center of their agenda. These and other high level move that China is leading or jointly lead together with other official players, if can fully utilize the advice and influence of these non-state and non-governmental players, will greatly help China's communication at global stage. This can also contribute greatly to enable China to tell its stories such as "Green is Gold", Ecological Civilization, and Ecological Redlining in a global setting and in a way that can be well understood by international communities.

Ministerial discussions are also critical. Japan, when it hosted CBD COP10, organized ministerial events took place at an early stage, along with discussions involving other countries. This display of political will helped to bring about consensus for an agreement at the COP; provided a chance to hear issues from concerned counties at an early stage; and provided early nomination and sufficient guidance for ministerial facilitators during the COP.

[10] https://www.youtube.com/watch?v=s9LC86_E0nc

It is encouraging to see that China has now reaching out to other parties and UN system players to explore joint agenda and share thoughts and ambitions with multiple players. The level of countries and UN agencies to participate these events are high and engaging, reflecting the expectation of international communities to China's leadership. These "green diplomacy" originated from China's central government mostly from the MEE and ministry of foreign affairs. If these efforts could be combined with outreaches of China's ambassies in countries, missions to the UN and EU, negotiators at negotiation fronts, and Chinese research institutions, it would be more powerful to position China at global stage with regard to nature agenda, amidst Covid 19 pandemic and geopolitical divide.

The initiatives presented above indicate that momentums of integrating nature into the political agenda are high. However, challenges are also obvious. These mainly land in the following aspects:

- Significant gaps observed in translating leaders' commitments into national actions;
- The GBF negotiations under the auspices of the CBD has not stepped up sufficiently to translate the leaders' ambition into the GBF ambition;
- Drivers of biodiversity loss, in particular the indirect drivers, have not gained needed attention and action;
- The biodiversity agenda and other key agenda such as climate change, COVID response and economic development are still not integrated, for instance the carbon neutral and biodiversity restoration elements have not been noticeable in green recovery packages;
- Financial flows are currently detrimental to nature, with 10 times more investment that are harmful to nature than in biodiversity conservation and sustainable use（WWF & PWC, 2020）.

Amidst all these, China's role has been observed but the expectation from the global community is still very high. For example, China's Vice Premier Han Zheng delivered welcome speech at OPS; Minister Huang Runqiu worked with the Egyptian government and the CBD secretariat to promote the Sharm el-Sheikh to Kunming "Nature Action Agenda" [11].

China's top leaders could consider how to build and maintain the momentum on biodiversity together with the UNGA76 in September, and with G20 and UNFCCC COP26 following immediately, as well as the Stockholm + 50 that is due to take place in June 2022. China still has time to express at global stage their determination, commitment, and willingness to work with global communities to bring the "Green is Gold" concept of development into global nature positive movement. With impact from the Covid 19 pandemic, with the delay and impediment of negotiation by information technology viability and stability, it is more imperative for China to consider one or the combinations of several of the following steps, to show leadership and build enabling conditions for the post 2020 GBF. Concretely, we suggest:

- Actively join the UNGA 76 and join the efforts with global leaders on nature, making China's own commitment and ambition for the COP15 clear and transparent in order to trigger good preparation and ambition by other governments;
- Call for or join a side HoS event at the UNGA 76 for Nature (physical or virtual), as an impulse for the COP15 and COP26 to integrate biodiversity, climate and health agenda together;
- Call for global leaders to have a (virtual) grand opening of the CBD COP15, jointly with the UNSG

[11] The Sharm El-Sheikh to Kunming Action Agenda for Nature and People is an initiative of the Chinese and Egyptian Governments with the support of the CBD Secretariat. The aim is to establish contacts with non-State actors during the current decade to inform, motivate and demonstrate voluntary commitment to raise awareness of the urgency, ambition and necessary action to reduce biodiversity loss and its causes, and to achieve positive results in a transition to nature. As of 24 February 2021, there were 169 commitments in the Agenda for Action, including actions taken by Governments, the private sector, non-governmental organizations, and academic and research institutions. https://www.cbd.int/action-agenda/newsletter.shtml

and inviting HoS/G and/or key ministers beyond ministry of nature/environment/natural resources, to join forces and set a strong and positive tone to provide enabling condition for a strong and transformative post 2020 GBF;

- Chinese MEE minister takes the opportunity to call the ministerial high-level segment, to include the ministers of finance, agriculture, infrastructure, economic, planning, and statistics from party countries;
- Make use of bilateral relations and diplomatic influence in preparation for the Kunming COP15;
- Start building bridges between developing, developed and large countries and prepare itself for a facilitative role to get the maximal commitments from all groups.

3.2 Initiatives from other parts of the world on translating political signals to national actions.

3.2.1 A Global Goal for Nature

With climate, there is a clear goal of carbon neutrality, articulated in the target of net zero emissions by 2050, with the objective of keeping global warming below 1.5C. A similar time bound goal is needed for nature, to ensure that we halt and reverse biodiversity loss at the pace necessary, in support of climate action and the SDGs. A group of 14 organizations proposed a Nature Positive by 2030[12] as a global goal for nature - in parallel to the UN Climate Convention's "net zero" carbon goal.

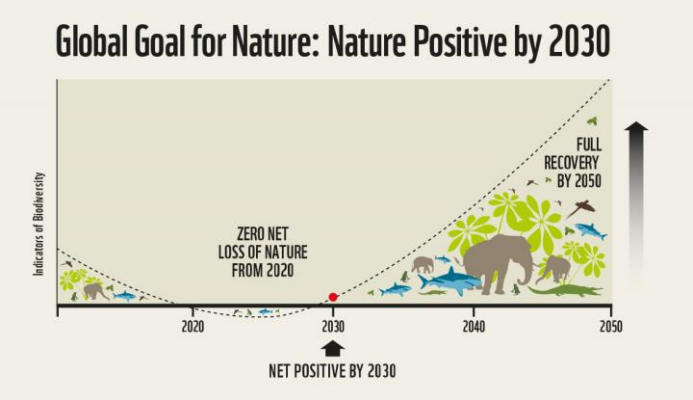

Figure 3-1. Nature Positive by 2030.

Nature Positive by 2030 global goal entails that through improvement of the health, abundance, diversity and resilience of species, populations and ecosystems, the nature is restored, so that by 2030 it will be recovered beyond the baseline in 2020. The Global Goal for Nature would commit governments to taking action now to halt biodiversity loss and ensure that the world is nature-positive by the end of this decade. The "Nature Positive" concept has been taken up by many leaders in their interventions and speeches since Sept 2020. The vision of Nature Positive by 2030 for the humanity's sustainable development should be well reflected in the post 2020 GBF.

3.2.2 Upsurge of calls to action

[12] https://www.naturepositive.org/

During the run up to the UNGA75 and the UN Biodiversity Summit, there has been an upsurge of non-state actions calling for actions to address planetary emergencies and strive to reverse the loss of nature[13]. More than 15 environment and development organizations, more than 20 humanitarian and development organization, plus more than 100 faith and spirit groups supported Call to Actions for nature. A Youth Manifesto have been signed by more than 1000 people to say "enough" of behaviors that are harmful to nature. More than 20 local and regional governments also joined the Call to Actions on nature, people and planetary health. Business has shown unprecedented concerns on the loss of nature: 530 companies committed to reversing nature loss, 1200 companies acting now to reverse nature loss, 700 CEOs signed Business For Nature Call to Action seeking policies to reverse nature loss, and the new Science Based Targets for Nature Guidance have been launched（WWF, 2021）.

3.2.3 Inclusive governance for conservation

Increased attention and dialogues are on issues of inclusive conservation and recognizing the rights and conservation effectiveness of Indigenous Peoples and local communities (IPLCs). Over the last 20 years, area-based conservation has evolved from a model largely dominated by state-governed protected areas to one that is more inclusive of non-state actors and areas outside protected areas. There is more explicit recognition of and support for diverse, effective and equitable forms of governance. This is reflected in the advice and guidance provided by the Parties to the CBD in Decision 14/8 in 2018 and in the IPBES Global Assessment 2019 regarding other effective area-based conservation measures (OECMs) and guidance on the governance of protected areas and OECMs.

3.2.4 Ecosystem Accounting

On another front, the UN has in 2021 adopted a framework to integrate biodiversity in economic reporting: system of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA) as an international statistical standard. The SEEA EA system will enable countries to measure their natural capital and understand the immense contributions of nature to our prosperity and the importance of protecting it（UN, 2021d）. China's own pilot Natural Resource Asset Audit system has already shown that valuation of natural resources dynamics can link with performance and management of the leaders to generate benefits to both nature and people. This is a great opportunity for China to collaborate with the UN Statistics Commission to accelerate rollout of such auditing to the whole world to improve understanding and management of our valuable ecosystems and biodiversity.

3.2.5 Essential Life Support Areas

An initiative supported by National Geographic Society, Global Environment Facility, UNDP and many other partners provides rich spatial information through maps to facilitate decision making on area-based conservation, especially to suggest prioritized areas for the National Biodiversity Strategy and Action Plan (NBSAP)（Ogwal et al., 2020）. This can be combined with the ecological redlining initiative from China to be a hybrid approach that other countries might utilize.

3.3 Progress of the post-2020 global biodiversity framework

The negotiation of the GBF is at a critical stage. The co-chairs of the open-ended working group (OEWG) for the GBF have just released the first draft early July after negotiating on the updated zero-draft at SBSTTA-24 and SBI-3[14]. This first draft will then be going through negotiations in a few modality steps

[13] https://www.iied.org/act-nature-demand-hundreds-organisations-unprecedented-call-world-leaders

[14] https://www.cbd.int/article/zero-draft-update-august-2020

(e.g. online discussion at the OEWG-3) before being submitted to the COP15 for final negotiation and adoption.

Analysis of the current first draft and the past updated zero-draft and their (lack of) ambition towards a nature positive future by 2030 that world leaders have agreed in their Leaders' Pledge for Nature, shows gaps that need to be filled. More efforts are much needed for parties and observers of the CBD to strive to step up the ambition and bridge the gap.

Overall, there are several issues that the current first draft and the past updated zero-draft have not sufficiently addressed, of which the future (final) draft(s) need to take into account:

- 2050 goals, 2030 milestones and 2030 targets remain insufficient for the ambition required to achieve transformative change towards halting and starting to reverse the loss of nature by 2030, which is called for by the world leaders through the Leaders Pledge for Nature.
- The voices from around the world are calling for protecting at least 30% of the planet's surface (land and ocean). It needs to be emphasized that we should protect the best (at least 30%), sustainably manage the rest and restore at least half of degraded land.
- Conservation alone cannot reverse the loss of nature, there is a strong need to have a 2050 goal or 2030 milestone on the footprint of production and consumption, which are drivers for biodiversity loss. These sectors include food and agriculture (including aquaculture), forestry and fisheries, infrastructure and their supply chains. Without seriously diverting from actions that are harmful to biodiversity conservation and sustainable use, we will not be able to reverse the loss of nature.
- A three faceted approach on financing for nature should be considered: a) reforming economic sectors to remove investments and subsidies that are harmful to nature, b) realign global financial flows with biodiversity conservation, sustainable use, and with nature based solutions, and c) mobilize more resources for biodiversity conservation and sustainable use.
- The GBF needs to ensure the framework is implemented through a whole of society, whole of government approach. We need to protect people through conserving nature.
- The GBF should also play a role that can enhance synergies among MEAs.

In order to halt and reverse the biodiversity loss by 2030, conservation is critical, but not sufficient. Science has told us, from land use angle, if we are to reverse the loss of nature, interventions on all levels are needed: sustainable production and consumption, AND more ambitious conservation measures (WWF, 2020), as shown in the following graphs (Figures 3-2 and 3-3).

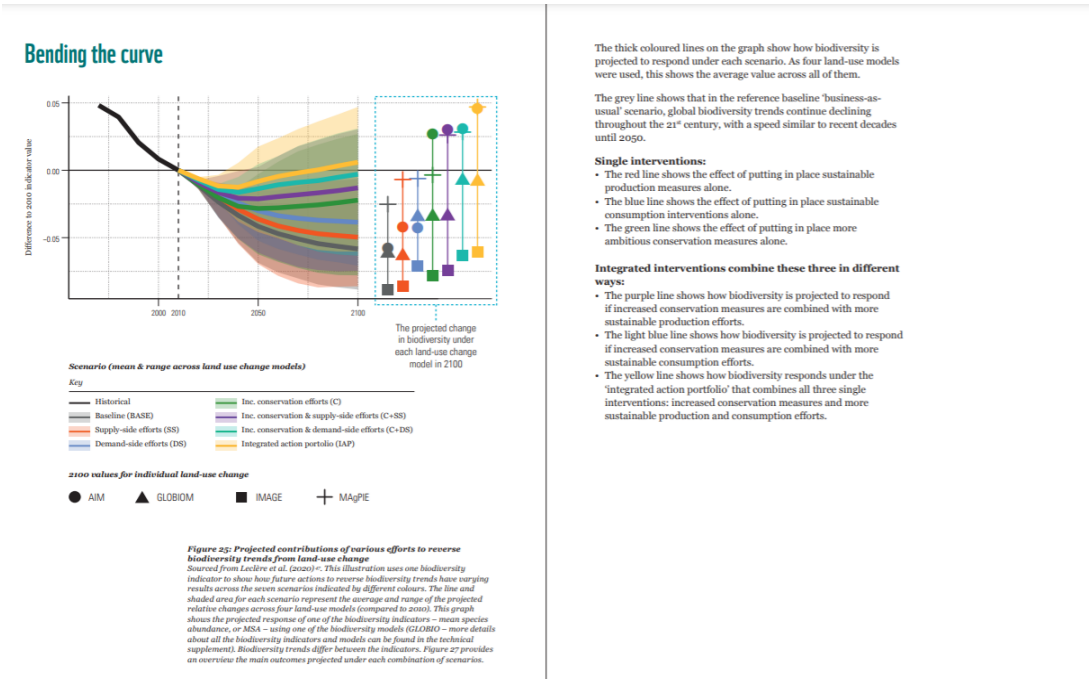

Figure 3.2 Bending the Curve. *Source: WWF Living Planet Report 2020*

Efforts for reducing the loss and restoring biodiversity will need to 1) increase conservation and restoration, 2) increase climate action, 3) increase sustainable production, 4) reduce consumption, and 5) reduce other drivers（Secretariat of the Convention on Biological Diversity， 2020c）, as shown in the following graph.

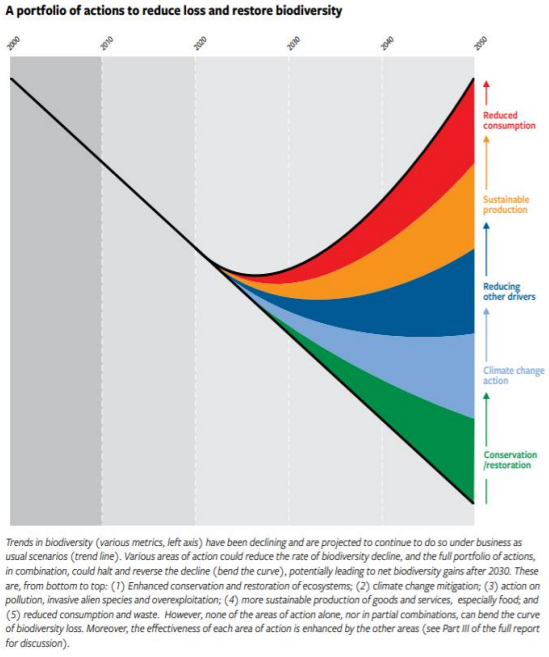

Figure 3-3. Actions to reduce loss and restore biodiversity. *Source: Global Biodiversity Outlook 5*

Recent CBD document CBD/SBSTTA/24/3/Add.2 [15], suggested two approaches to further define the draft mission statement. The world will need to have an approach that provides a clear path to net gain of biodiversity and nature's contributions to people by 2030 ('curve A' on page 3 in the document). See below.

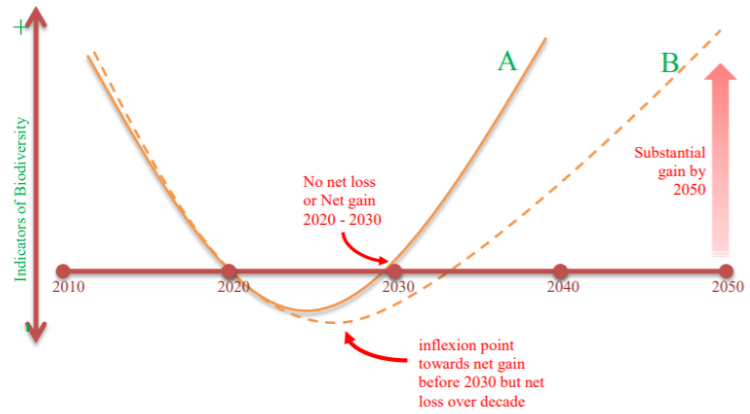

Figure 3-4 Biodiversity status during the decade 2021-2030 and towards 2050

With regard to the preparation of an ambitious first draft of the GBF, the following concerns should be considered:

- The theme of COP 15 "Ecological Civilization - Building a Shared Future for All Life on Earth" should be reflected in the preamble or background paragraph of the draft.
- The GBF is a framework for all, including all parts of government. The goals, targets and indicators should be set to all relevant ministries in the country;
- The GBF needs the participation of the whole of society by ensuring equitable participation of all key stakeholders including indigenous peoples and local communities, women and girls as well as youth
- With the outbreak of the COVID-19 pandemic, biosafety, biosecurity, biotechnology and newly emerged zoonotic diseases shall be adequately considered for sustainable development and human health
- On the implementation supporting mechanisms, we propose that the attention should not only be given to mobilizing funding for biodiversity conservation and restoration, but also to reforming financial and accounting systems to remove subsidies and investment that are harmful to nature, and to realigning these financial flows to the conservation, restoration and sustainable use of biodiversity
- Strong synergies are needed among relevant multilateral environmental agreements and other relevant international processes, especially on the interests of biodiversity and commitments or contributions to conservation efforts, including the 2030 Agenda for Sustainable Development, and instruments at the global, regional and national levels, including through the strengthening or establishment of cooperation mechanisms
- In order to track the outcomes of the implementation, more frequent reporting, review and ratcheting processes will be needed.

More specific recommendations can be found in Annex 3.

Based on China's neutral role as the host country, Chinese negotiators can still champion on some issues that are critical to the GBF and that China has accumulated good experiences and practices. These issues could include topics such as biodiversity mainstreaming and resource mobilization.

[15] https://www.cbd.int/doc/c/9139/8957/661e2d7c33e590d55fdeae2f/sbstta-24-03-add2-en.pdf

China's initiatives such as 'Green is Gold', 'Ecological Civilization', senior governmental staff resource and environmental condition departure audits (e.g., when they move to new positions, or retire), etc., are examples of mainstreaming of biodiversity practices. China should actively and openly champion this topic in the GBF discussions, drawing on China's own efforts. This will boost the positive momentum from real world experience.

Another issue that China could consider is financial resource mobilization. When talking about financing for nature, there are three aspects that need to be addressed: reduce and eventually remove the investment and incentives that are harmful to nature, realign these investment and funding to invest in nature positive actions and programs, and doubling of conservation financing and international development aids that are investing in nature. China's comprehensive practices, such as eco-compensation, transfer payment system, and South-South cooperation, can all be used to form China's comprehensive initiatives on biodiversity financing that can be tabled to the GBF and lead the dialogue for an ambitious and realistic GBF.

3.4 Prepared for acceleration of immediate implementation of the GBF after the COP15

The GBF that is agreed at the COP15 needs to reflect the level of ambition that is needed to keep the biosphere operating in a manner that produces the goods and services on which humankind is dependent, as well as to effectively combat the interrelated biodiversity, climate, and health crises. Achieving a net gain in ecosystem health and species abundance and preventing human-induced extinctions of known threatened species by 2030, transformative changes in land and sea use, resource use efficiency, production and consumption patterns (particularly for food), resource mobilization and inclusive decision-making will be urgently needed. These changes will require the political will to agree and implement ambitious targets for 2030, the establishment of effective monitoring of results and corrective mechanisms if deviations from targets are detected.

Actions must be taken immediately building on the increasing momentum for nature conservation, sustainable use of biodiversity and access and benefit sharing. Additional immediate actions will be required in other areas, including to enhance the enabling conditions for ambitious nature positive actions.

Monitoring of progress and complementary scenario analysis may further define other critical elements of the solution.

4. Global and regional approaches for post-2020 protected area priorities

This chapter is based on scientific studies with a focus on area-based conservation. Three studies have been conducted accordingly to address three key questions for global biodiversity conservation. First, what strategies could be used for area-based conservation? Should countries adopt a uniform conservation area target (e.g., 30% and 50% targets under discussion for post-2020) or a differentiated target for different countries if taking account of the uneven distribution of biodiversity, and countries' different contribution to nature degradation and ability to pay for the cost? Study 1 aims to answer this question. Second, what strategies could be taken to achieve the ambitious conservation targets? Study 2 proposes the concept of

Cost-Effective Zones – areas with high biodiversity importance but less used by people– as a solution to boost conservation areas without causing heavy impacts on the development of human society. Third, when conservation priorities vary at different spatial scales, for example, from global, regional to national scale, how should conservation actions be coordinated at different scales to most efficiently conserve biodiversity? Study 3 takes Asia as an example (Yang et al, 2020) to illustrate that multiscale visions are needed to optimize outcomes and to explore synergies between climate and biodiversity targets[16]

The policy recommendations are proposed based on the findings of these three systematic and comprehensive studies for post-2020 biodiversity framework. All three studies demonstrate the necessity of bold conservation targets for effective species conservation and highlight different responsibilities of individual countries in their biodiversity conservation. Ensuring high ecosystem integrity – study 2 proposes a possible approach – is also important within the priorities areas identified for global biodiversity conservation. The synergies between biodiversity and carbon are necessary and feasible. Mechanisms such as adopting National Voluntary Commitments in NBSAPs, and seeking funding for less developed countries that bear high conservation responsibilities are critical to ensure achievement of intended conservation targets[21].

4.1 Countries' differentiated responsibilities in fulfilling global conservation area targets

The efficiency of two conservation approaches for area-based conservation on land was compared: (1) **under the country scenarios**: setting a uniform conservation target (30% and 50%, respectively) for all countries and thus identifying conservation priorities within each country independently; and (2) **under the global scenarios**: setting different conservation targets for different countries based on the spatial distribution of biodiversity while the total amount of conservation areas remain the same (30% and 50%, respectively). Systematic conservation planning tools were used to identify conservation priorities that maximize the conservation of terrestrial vertebrate species and carbon with consideration of other elements (representation of ecoregion and conservation cost).

The results show that **prioritizations identified under the global scenarios would conserve far more terrestrial vertebrate species and carbon than setting uniform targets for all countries**. For example, for threatened species, the prioritizations generated with a 30% conservation target under the global scenario adequately represented 12.6% more mammals, 19.6% more birds, 17.7% more reptiles, and 15.7% more amphibians than the prioritizations generated under the country scenario. Similarly, the prioritizations generated with a 50% conservation target under the global scenario adequately represented 10.6% more mammals, 15.3% more birds, 10.6% more reptiles and 16% more amphibians compared to that under the country scenario. These results suggest that globally coordinating conservation efforts could vastly improve biodiversity outcomes as opposed to adopting a uniform conservation target for all countries.

Although prioritizations under the global scenarios were more effective in conserving species and carbon, great challenges remained for countries to fulfill their identified conservation targets. **Under the global scenarios, conservation targets identified for countries varied greatly among countries with heavier**

[16] The details of Study 2 can be found at R. Yang, Y. Cao,…, KP. Ma. 2020. *Cost-effective priorities for the expansion of global terrestrial protected areas: Setting post-2020 global and national targets.* Science Advances 9 Sept 2020: Vol. 6, no. 37, eabc3436 https://advances.sciencemag.org/content/6/37/eabc3436 .The other two studies are under review currently. Important conclusions and recommendations are highlighted in bold to facilitate reading.

conservation burdens for economically poorer countries where biodiversity tends to be the richest (Fig. 4-1).

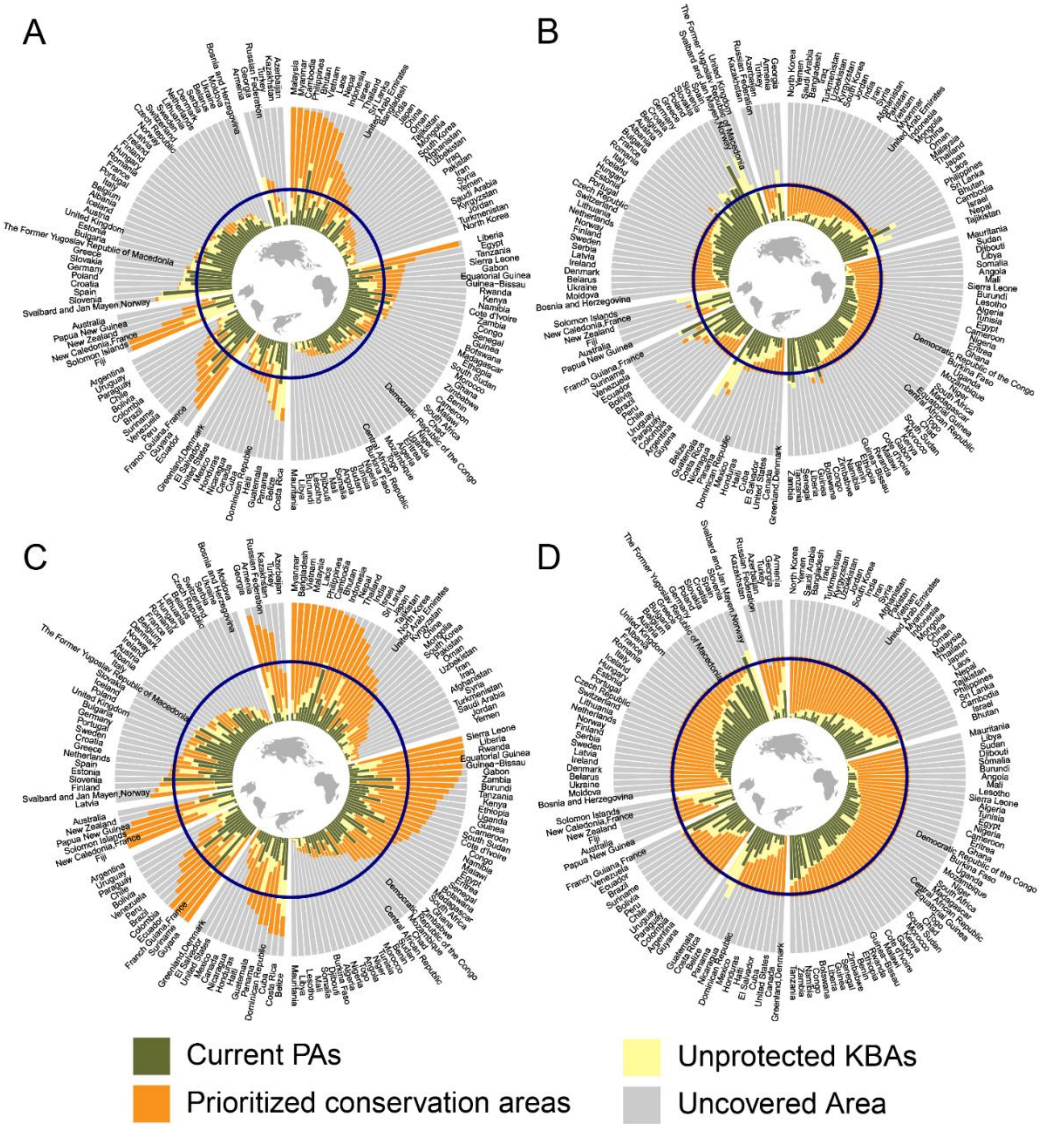

Fig. 4-1. Percentage of current protected areas (PAs), unprotected Key Biodiversity Areas (KBAs), prioritized conservation areas (not including PAs and KBAs), and uncovered areas (i.e., areas not identified as conservation priorities) for each country under the global (A, C) and country (B, D) scenarios to meet the 30% and 50% conservation targets, respectively. Each bar represents 100% of the land area in a country, which is the sum of the percentages of the four types of land. PAs and KBAs are treated as top priorities for conservation. The total percentage of PAs, KBAs and prioritized conservation areas in a country is the percentage target of area-based conservation identified for the country. The blue circle in A and B represents the 30% percentage line, and that in C and D represents the 50% percentage line. Some countries are identified with very high conservation targets under the global scenarios, such as Malaysia, Myanmar and Cambodia under the 30% target (A), and Fiji and Solomon Islands under the 50% target (C). The conservation targets for few countries under the country scenarios exceeded 30% (B) or 50% (D) in order

to meet other requirements (i.e., representation of ecosystems). Countries with a terrestrial area < 18,000 km^2 are excluded.

We suggest cooperative and coordinated actions between countries to enhance outcomes for biodiversity under the post-2020 framework. More importantly, when countries have different conservation responsibilities, mechanisms to ensure fair sharing of conservation burdens among countries and to overcome practical obstacles to implementation are important. Much can be learned from the Paris Agreement for climate change mitigation and adaptation in this regard. We make specific recommendations below, with a focus on the implementation of different conservation targets among countries:

- We propose that the CBD adopt global conservation priorities to guide national conservation efforts and use "**the proportion of global conservation priority areas maintained or restored to a favorable condition**" as an indicator to measure progress.
- We recognize that local factors (e.g., legislation and policies, socioeconomic environments, and conservation willingness and capacity) will largely determine the feasibility of the conservation targets, and suggest that countries adjust the targets identified via global prioritizations so they are in accordance with national circumstances, and incorporate their committed targets (i.e., **National Voluntary Commitments**) in countries' National Biodiversity Strategies and Action Plans (NBSAPs).
- Countries with high targets (e.g., Malaysia, Myanmar and Liberia) could start with a lower target and incrementally increase their target commitments over time. The progress towards the intended conservation targets of individual countries should ideally be reviewed on a regular basis (e.g., with a five-year interval) to inform successive country-level commitments to the conservation targets.
- We suggest countries with low conservation burdens (measured by prioritized conservation area divided by Gross Domestic Product) could provide financial and technical support to those with high conservation burdens (e.g., Central African Republic, Somalia and Guyana). In particular, countries with a higher ecological footprint could support conservation in other countries - ideally in those that receive the footprint, for example, in a global supply chain - to offset their ecological footprint.
- We emphasis the important role of **other effective area-based conservation measures** (OECMs) in achieving the high conservation target and in the implementation of the post-2020 biodiversity framework. Field survey and database should be set up to record existing OECMs and support them to ensure their continued effectiveness.
- We call for innovative and inclusive approaches that recognize and encourage sustainable management systems to help maintain the biodiversity of global significance in human-dominated landscapes. Designations that maintain and enhance multiple benefits (e.g., environmental and social benefits) in human-dominated landscapes would be critical to alleviate the conflicts between biodiversity conservation and social-economic development of human society for achieving high conservation targets.

4.2 Cost-effective priorities for the expansion of global terrestrial protected areas: Setting post-2020 global and national targets

A spatial meta-analysis was conducted to identify global terrestrial Conservation Priority Zones (CPZs), defined as areas covered by any of the seven global biodiversity templates (i.e., Crisis Ecoregions, Biodiversity Hotspots, Endemic Bird Areas, Key Biodiversity Areas, Centers of Plant Diversity, Global

200 Ecoregions, and Intact Forest Landscapes). CPZs were further categorized into three groups based on its significance in biodiversity: areas covered by three or more templates were defined as level 1 CPZs, those covered by two templates were defined as level 2 CPZs, and areas covered only by one template were defined as level 3 CPZs. Cost-Effective Zones (CEZs) were identified as CPZs within the Low Human Impact Areas, which were areas with biodiversity significance and less used by humans. Establishing new protected areas in these areas would alleviate the conflicts in land use and reduce the cost.

The results show that CPZs cover 77.2% of the global terrestrial land, including almost all terrestrial area near the equator. CEZs cover around 38% of global terrestrial land, of which only 24% is currently covered by existing protected areas. Three scenarios are proposed to protect CEZs corresponding to the three levels of CPZs. **The conservative target aims to conserve the level 1 CEZs, the moderate target aims to conserve both level 1 and level 2 CEZs, and the ambitious target aims to conserve CEZs of all three levels, which account for 19, 26, and 43% of global terrestrial land, respectively.**

The percentage of CEZs within a country varies widely (Fig. 4-2). Under the ambitious target, the top 10 countries (including the Russian Federation, Australia, Canada, Brazil, China, the United States of America, Congo, Kazakhstan, Indonesia, and Angola) with the largest protected area expansion potential contribute 66% to the global expansion of protected areas.

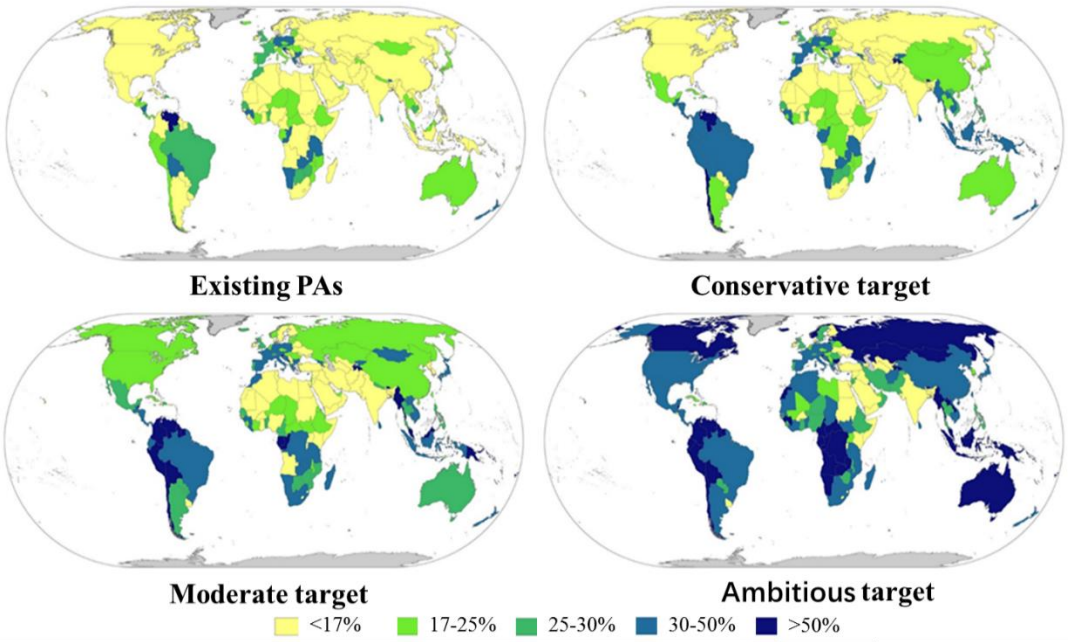

Figure 4-2. Maps of countries with different percent range protected under four scenarios. (A) existing PAs, (B) conservative target, (C) moderate target, and (D) ambitious target.

We suggest using the concept of Cost-Effective Zones to guide future conservation efforts. As only 24% of CEZs are currently under protection, there is huge potential to add CEZs to the existing protected area network. The proportion of protected areas under the four scenarios (see details in Fig. 4-2), CPZs coverage, the proportion of unprotected CPZs (unprotected CPZs/total CPZs), CEZs coverage and the proportion of unprotected CEZs (unprotected CEZs/total CEZs) for the 195 CBD country parties (excluding the European Union) was shown in Table S1 in the Annex. Especially, we emphasize four categories of countries that require special attention:

- *Mega CEZ countries.* CEZs are concentrated in a small number of countries including the Russian Federation, Australia, Canada, Brazil, China, and the United States of America, which together make up 53% of all CEZs by area. These countries are crucial to global biodiversity conservation and have great potential to increase their conservation targets.
- *Countries needing to protect more CEZs.* Countries with the largest unprotected CEZs globally or those with the largest area of unprotected CEZs as a percentage of their total terrestrial land areas should take immediate action to expand their protected areas.
- *Countries with many CPZs but few CEZs, such as India.* These countries not only have important biodiversity conservation value but also have substantial human impacts. Countries in this group are likely to require more inclusive conservation actions, such as using OECMs, and ecological restoration and/or rewilding.
- *Countries with many protected areas but few CEZs*. As an example, Germany has 36.6% protected area coverage on land, while CEZs only account for 3.1%. This highlights that CEZs should not be seen as the upper limit of protected area coverage; the protected area system could be expanded outside of CEZs to protect other areas with national biodiversity importance.

4.3 Regional scalable priorities for national biodiversity and carbon conservation planning in Asia

Although Aichi Target 11 is regarded as the most successful Aichi target, the specifications aiming at representativeness are often overlooked when it comes to area-based conservation. No framework has been widely implemented or created to translate priorities into actions that are both representative regionally and implemented feasibly at the national scale. The priorities for synergy of biodiversity and carbon storage are defined as the highest value regions contained in 30% or 50% land area (based on the potential area-based conservation for 2030 target and 2050 vision) for each zone of the three scales: regional (Asian range), biome and national scale, respectively.

Our analysis demonstrates that current protection for 8,932 terrestrial vertebrate species across Asia is neither comprehensive nor representative. Existing protected areas alone are able to effectively protect (based on the Butchart approach) (Butchart et al, 2015) only 25% of mammals, 20% of birds and 10% of reptiles and amphibians. Targeting 30% of the land could protect over 70% of all represented species, with an increase of 59% of species additionally protected relative to current protected areas, as well as would preserve 2.3-3.6 hundred billion tonnes of stored carbon across these regions, and yet such regions are not protected at present in most cases. Diverse ecoregions frequently have the greatest protection gaps. For example, Western Asia and South China show notable gaps between existing protection areas and our proposed priorities. Taking ASEAN plus Three Cooperation countries (APT, involving the ten ASEAN countries and three Northeast Asian countries including China, Japan, and South Korea) where have the richest species and highest extinction threats for example, the majority of countries have priorities which exceed 30% of land area (Fig. 4-3A). **Most tropical countries had priorities spanning over 60% of their land area, and two countries (Brunei and Laos) had priorities spanning over 90%.**

Assessing effectiveness of the protection coverage of species within countries can enable conservation planning both at national and regional levels. The regional priority areas perform very well at covering species in most countries, but diverse countries such as Indonesia, Philippines and China often have greater conservation gaps (Fig. 4-3B). Laos has the heaviest conservation burden (defined as the ratio of the sum of conservation area weighted by human modifications contained in each country and the gross national income adjusted for purchasing power parity) for both current and future, followed by Myanmar and

Cambodia with less than half of the additional burden than Laos for 2030 target and 2050 vision (Fig. 4-3C-D). Yet Southeast Asia is undergoing a biodiversity crisis, and while the analysis highlights the additional area required to effectively conserve species across the majority of tropical Southeast Asian countries, this may be especially challenging to achieve in the parts of the world that are experiencing some of the highest rates of habitat loss.

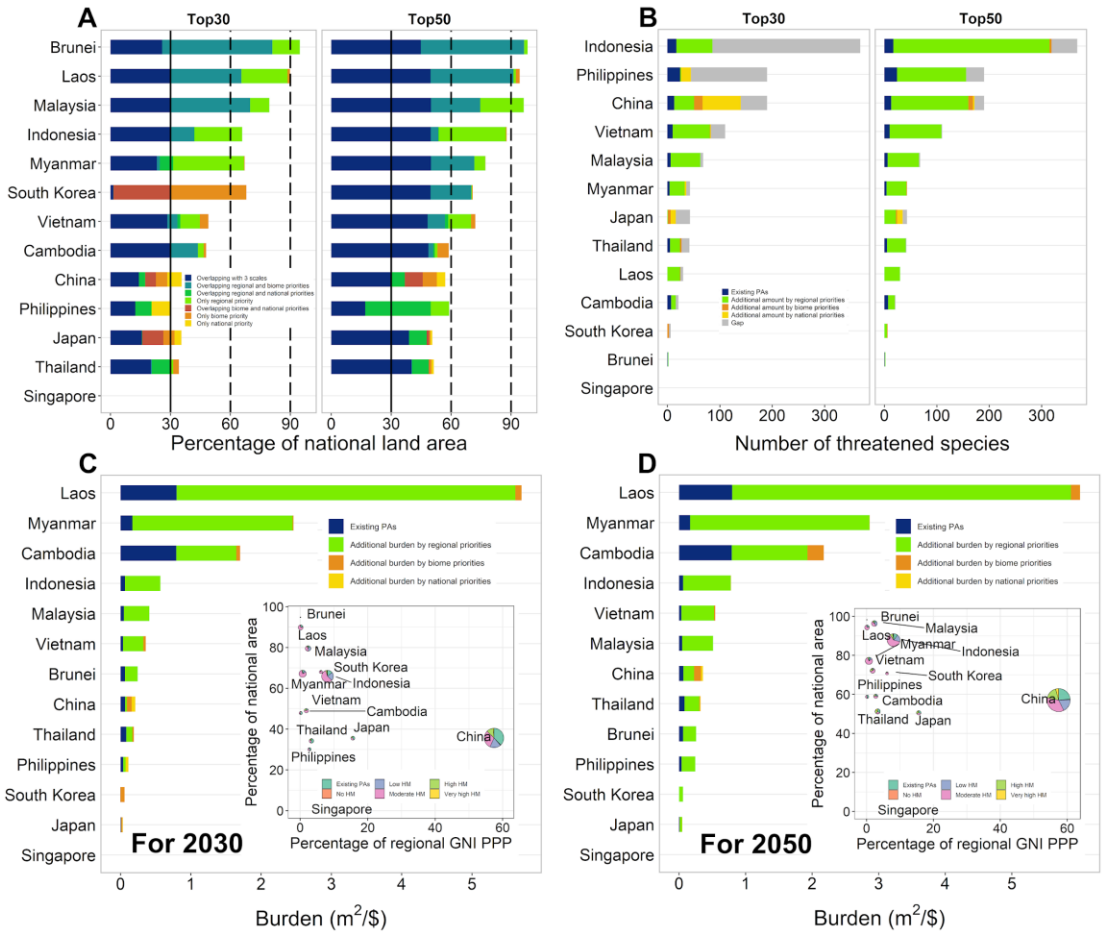

Fig. 4-3. Differences in current and future conservation responsibilities (A), contribution (B) and burdens (C-D) among countries for 2030 targets and 2050 visions. (A) The percentage of multiscale priorities contained in each country. Multiscale priorities of regional and biome scales as well as overlapping host the higher priority ranks than national priorities in each country. Dark blue indicates the most congruence among three scales with the highest prioritization for conservation. (B) Variation in effective protection contribution for threatened species by existing protected areas (blue), additional amount by regional priorities combined (green), by biome priorities combined (orange) and additional amount by national priorities combined (yellow) in each country. The total number of the threatened species distributed in each country are shown in grey color. Inserted pie charts illustrate the proportion of multiscale priority area by existing protected areas and different degree of HM in each country. The radius of pie chart is proportional to the total multiscale priority area contained in each country.

Regional scalable priorities can help national biodiversity and carbon conservation planning in Asia

- **Multiscale visions** should be developed to support biodiversity and ecosystem services for nature protection in the future, thus combining a range of different scales to explore synergies between both climate and biodiversity targets can be used to optimize outcomes. To develop more ambitious and

effective targets for national scales, while simultaneously taking into account complementary scalable priorities, actions could be enacted in **a stepwise manner**: regional priorities should be regarded as the highest priority (having the highest conservation efficiency), and then complemented by additional biome priorities (for ecological representativeness and diversity), and finally by national ones (as the common conservation benefits of region and country) to achieve more ambitious targets. This will maximize the representativeness and the number of species effectively covered, given the latitudinal gradients in biodiversity across the Asian region. Where regional priorities within a country exceed 30% of land, areas overlapping between regional and biome priorities should be prioritized to maximize the benefits across of species and ecosystem dimensions.

- **Additional funding or new approaches achieving transformative changes** are needed to enable conservation in larger areas in hyper-diverse regions, where 30% of land is insufficient to provide effective conservation for native species. For the CBD to effectively provide achievable goals and stem biodiversity loss, additional climate funds could be used preferentially within such regions. Moreover, mechanisms developed to ensure that complementary targets can heighten funds available to support conservation where possible and improve carbon storage ability in nature-based solutions to climate change. Yet even with this, the large conservation burdens in regions such as Laos, Myanmar and Cambodia call for further mechanisms to mainstream biodiversity and conserve diversity in complex and working landscapes. Furthermore, whilst business has started to engage with CBD initiatives, working to maintain biodiversity in regions such as China where aim to CO_2 emissions peak before 2030 and carbon neutrality before 2060 will require new approaches to agriculture and development, including green finance, certification schemes and rigorous assessments to provide viable means to support higher levels of protection needed in key regions.

5. **Technical optimization for Ecological Conservation Redline (ECR) delimitation**

5.1 ECR is an area with important special ecological functions that should be strictly protected.

ECR usually includes important ecological function regions with important functions of water conservation, biodiversity maintenance, soil and water conservation, wind prevention and desertification reduction. Coastal ecological stability, as well as ecological vulnerable regions suffer from soil erosion, desertification, rocky desertification and salinization. Although carbon storage and carbon sequestration are key parts of the ecosystem services, they have not been addressed in the current ECR delimitation technical system.

According to the requirements of “Several opinions on delimiting and strictly observing the ECR” and "Guidelines for delimiting the ECR"[17] issued by the Chinese government in 2017, the ECR delimitation technical system consists of indicator selection, scientific evaluation and comprehensive mapping. The indicator selection involves ecological functions and ecological fragility. The former includes water conservation, soil conservation, sand (desert) fixation and biodiversity maintenance, while the latter including soil erosion, land desertification, rocky desertification and salinization. The scientific evaluation selects appropriate models to quantitatively evaluate each indicator to identify hot spots of ecosystem services and ecological fragility. The comprehensive mapping revises the results of scientific evaluation, based on high-precision remote sensing images and land use data, in order to delineate the ECR with clear boundaries and ecological integrity.

[17] “Several opinions on delimiting and strictly observing the ECR” was issued by the Chinese government in February 2017. They describe the scope and boundary of the ECR. "Guidelines for delimiting the ECR" was jointly prepared by the Ministry of Ecology and Environment, the National Development and Reform Commission, which was released in May 2017.

The ECR delimitation technical system provides an effective way for provinces (autonomous regions and municipalities) in China to improve the overall ecological protection network. For example, Qinghai Province, part of the Qinghai Tibet Plateau, The ecological protection network of "one screen, one belt, three areas"[18] is formed by delimiting ECR, effectively protecting the glaciers and snow mountains, river sources, forest shrub, grassland vegetation and desert vegetation in Qinghai Province plus downstream areas. In addition, the delimitation of ECR also improves the effectiveness of biodiversity conservation for some provinces with rich biodiversity. For example, Sichuan Province is one of the provinces with the richest biodiversity in China. Based on the ECR delimitation technology, 30.45% of the province's areas are designated as ECR to establish an ecological protection network of "four axes and nine cores"[19], including Daba Mountain, Jinsha River, Zoige wetland and other key protection areas, thus effectively protecting more than 95% of the province's species resources.

The ECR delimitation technical system is applied in each province, autonomous region and municipality in China. The ECR areas are dominated by natural ecological land, such as forest, grassland, shrubs, and water wetlands. The ecological functions of the ECR include water conservation, soil conservation, biodiversity maintenance, and desert sand dunes stabilization and reduction.

5.2 Optimization of methods for identification of important biodiversity conservation areas

According to "Guidelines for delimiting the ECR", there are two methods for biodiversity protection redline: net primary productivity (NPP) method and species distribution model method. NPP method is easy to obtain because it requires less parameter factors. The species distribution model method needs to obtain the existing species distribution data and more environmental variables, resulting in very complex calculation, thus it is less used. We suggest that the assessment method for biodiversity protection/conservation redlining should be optimized. This study discusses optimizing the identification method for such areas by comprehensively considering data of wildlife richness, ecosystem types, endemic species and threatened species. Thus, we can use important areas of biodiversity conservation as the basis for biodiversity protection redline.

The important areas for biodiversity conservation include: (1) the areas needed for effective protection of key species. Key species include threatened species (CR, EN, VU) in the IUCN red list, threatened species (CR, EN, VU) in the national red list, national protected species (e.g., China’s class-I and class-II protected species), countries’ endemic species; (2) biodiversity hotspots, i.e., areas with high species diversity and high degree of threat; (3) other important areas of biodiversity protection recognized at global and national levels, including the Key Biodiversity Areas (KBA).

At present, the animal species distribution data available at the global and national scales are mainly based on the distribution map of the assessed species provided by IUCN red list database, which has a comprehensive assessment of terrestrial vertebrates (mammals, birds, amphibians, reptiles), plus a small number of plant species. The data of vegetation distribution can be supplemented by the data collected at national scale. For example, in China, several scientific research institutes have established the distribution

[18] "one barrier, one belt, three areas" pattern of Qinghai Province: "one screen" is the ecological barrier of the meadow wetland in the Three Rivers; "One belt" is the glacier and water conservation ecological zone in the Qilian Mountain; "three areas" are the Qinghai Lake grassland wetland ecological function zone, the Qaidam desert wetland ecological function zone and the eastern hilly biodiversity function zone.

[19] "four axes and nine cores" pattern in Sichuan Province: the "four axes" are the Daba Mountain, the hot-dry valley of the lower reaches of the Jinsha River, the mountains in southeastern Sichuan and the hilly areas in the basin. "Nine cores" are the Ruoergai Wetland, the source of the Yalong River, the source of the Dadu River, the Daxue Mountain, the Shaluli Mountain, the Min Mountain, the Qionglai Mountain, the Liangshan-Xiangling, and the Jinping Mountain.

database of woody vegetation at national scale. Therefore, species distribution data from different sources may include species distribution area map, county distribution map, species distribution area grid layer and other forms, which can be used for subsequent key area delimitation. According to the suggestion of (Brooks et al. 2019), the above species distribution map is superimposed with the altitude and habitat suitable for species distribution to further refine and extract the suitable habitat of species in the distribution area, namely the area of habitats (AOH), to identify the KBA.

(1) Identify areas needed for effective conservation of key species

Only when the protected area of certain species is large enough, can it survive sustainably. It is generally believed that the larger the distribution area of species, the larger protected area needed. Referring to the international standards for effective protection of species (Rodrigues et al. 2004; Mogg et al. 2019), the area standards for effective protection of species at a national scale are formulated. Overlaying the distribution map of key species and using systematic conservation planning software is a means to identify the minimum area for effective protection of key species.

(2) Identifying biodiversity hotspots

We can overlay the distribution map of animal and vegetation species and the data layer indicating the intensity of human interference (such as human footprint index, human modification and wilderness map), and assign values to different geographical units to reflect the urgency of taking action to protect them. The geographical units with high biodiversity and high degree of threat get a higher valuation. Then we determine the standard of national biodiversity hotspots (for example, select the top 20% or 30% geographical units with high valuation) as the biodiversity hotspots that need to be protected.

(3) Improve the management system of important biodiversity conservation areas.

KBA data can be obtained from public data sources, which are included in the scope of protection. Based on the above analysis, we can identify areas needed for effective conservation of key species and biodiversity hotspots. Thus important biodiversity conservation areas are identified. Then we should carefully assess the value of biodiversity protection in important biodiversity conservation areas, determine the priority management level, and identify regional and cross-sectoral institutional problems. This approach is needed in order to ascertain the level of integrity protection for the biological services and cultural value functions of the natural ecosystem—finally achieving the ultimate goal of biodiversity conservation.

5.3 Identification of the ECR areas with important carbon sequestration functions

President Xi Jinping announced China's carbon summit target and carbon neutral vision at the general debate and climate summit of the seventy-fifth UN General Assembly in 2020. Terrestrial ecosystems absorb a large amount of CO_2 in the atmosphere through photosynthesis of vegetation, which is regarded as the most economical and environmentally friendly way to slow down the increase of atmospheric CO_2 concentration. The ECR, which includes forests, grasslands, wetlands and other ecosystems with important carbon sequestration functions, can help to reverse the trend of ecological degradation and enhance the carbon storage and carbon sequestration potential of ecosystems.

Carbon storage and carbon sequestration is one of the key ecosystem service functions. However, the current guideline for delimitation ECR has not considered the carbon sequestration function yet, and there is no technical method for carbon sequestration function of ECR, which therefore makes some areas with large carbon reserves not fully included in ECR zoning, resulting in the lack of protection space for carbon sequestration function. **We suggest that ECRs can be delimited for carbon sequestration function.** Strict

protection and ecological restoration, with carbon storage and carbon sequestration recognized aa a critical part of ecosystem service function, could make a substantial contribution to improve the ECR system, mitigating global climate change and realizing the vision of carbon neutrality.

Taking into account the ECR delineation method and management requirements, referring to the current status of the terrestrial ecosystems, using the latest research results and government documents related to carbon sequestration, and taking typical ecosystems such as forest, shrub and grassland as the delimited objects, an evaluation index system of carbon sequestration importance was constructed. This involved three dimensions: carbon storage, carbon sink and carbon sequestration potential (Fig. 5-2, Table 5-1) to scientifically evaluate the carbon sequestration importance of terrestrial ecosystems in China and revealed differences in importance and regional distribution of the carbon sequestration function. The terrestrial ecosystem with high carbon storage, strong carbon sequestration capacity and great carbon sequestration potential can be classified as suitable for becoming the ECR of carbon sequestration function, conducive to achieving the goal of carbon neutralization.

The index system consists of four levels: target level, criterion level, element level and index level (Table 5-1). The target level is the importance of ecosystem carbon sequestration function. The criterion level includes ecosystem carbon storage, carbon sink and carbon sequestration potential.

Carbon storage indicates the ecosystem absorption of CO_2 in the atmosphere through photosynthesis, and fixes CO_2 in the form of organic carbon in soil and vegetation. The fixed amount is the carbon storage of terrestrial ecosystems. Ecosystem carbon storage includes vegetation carbon storage and soil carbon storage. Considering the short harvest period of crops, most of the biomass increased during the growth of crops is decomposed and released into the atmosphere shortly. Their carbon absorption and emission are thus generally balanced. Therefore, crop biomass is not considered in vegetation carbon storage analysis.

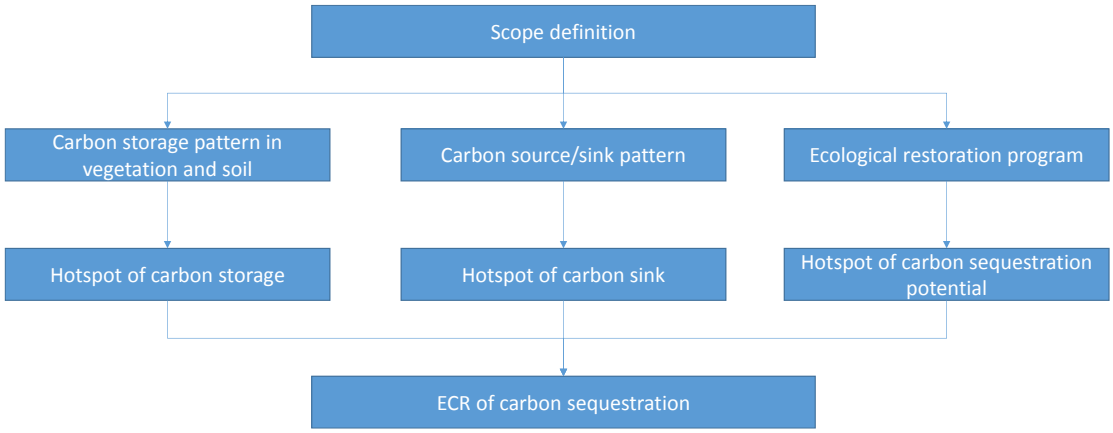

Figure 5-1. Delineation of ECR for carbon sequestration

The index system consists of four levels: target level, criterion level, element level and index level (Table 5-1). The target level is the importance of ecosystem carbon sequestration function. The criterion level includes ecosystem carbon storage, carbon sink and carbon sequestration potential.

Carbon sink refers to the function of terrestrial green plants to convert atmospheric CO_2 into organic matter for storage through photosynthesis, which mainly reflects the amount of CO_2 that can be fixed by the terrestrial ecosystem per unit area. Net Ecosystem Productivity (NEP) is usually used as the indicator. Without considering the interference of human activities, NEP greater than 0 indicates the role of carbon

sink of the ecosystem. NEP is the difference between vegetation NPP and soil HR (Heterotrophic Respiration).

Carbon sequestration potential refers to the amount of carbon sequestration that may increase from the base year to the target year with the implementation of ecological restoration projects. The carbon sequestration potential of the ecosystem depends on two key factors, namely the growth intensity of NPP and the carbon turnover time. During the fixed carbon turnover period, the greater the intensity of NPP growth, the higher the carbon sequestration potential of the ecosystem.

Compared with the research results of ecosystem carbon storage and carbon sinks, the prediction of carbon sequestration potential is more uncertain and lacks a reference on its spatial distribution, which makes its contribution to the definition of the ECR of carbon sequestration remain relatively small. Therefore, considering the situation above and with the expert consultation, the weights of indicators of the criterion level are defined with the principle of "carbon storage and carbon sequestration as the main component, and carbon sequestration potential as a supplement." The weighted values of carbon storage, carbon sequestration and carbon sequestration potential are therefore defined as 0.4, 0.4 and 0.2, respectively.

Table 5-1 Evaluation index system of carbon sequestration function

Target level	Criterion	Element	Index
Importance of carbon sequestration	Carbon storage (0.4)	Vegetation carbon storage	Forest aboveground biomass
			Grassland aboveground biomass
		Soil carbon storage	Soil organic matter content
	Carbon sink (0.4)	NEP	Vegetation NPP
			Soil HR
	Carbon sequestration potential (0.2)	Carbon increment	Vegetation distribution
			Vegetation annual NPP
			Vegetation annual NPP growth

5.4 Design and development of an automated identification platform of ECR

The technique for ECR delimitation can be applied automatically through GIS and computer information technology. Therefore, we propose to design an ECR software toolkit to integrate the methods and processes of ECR delimitation. On this basis, it can be used by other regions and countries.

The goal of the ECR software toolkit is to promote the concept, methods and tools of ECR in the global and regional ecological environmental protection planning, natural protection actions and natural resource management decision-making processes, and promote the scientific and simplified evaluation of ecosystem service functions. Government agencies, planning departments, regional organizations, enterprises and

environmentalists could use the toolkit to carry out ecological protection planning at the regional and national levels.

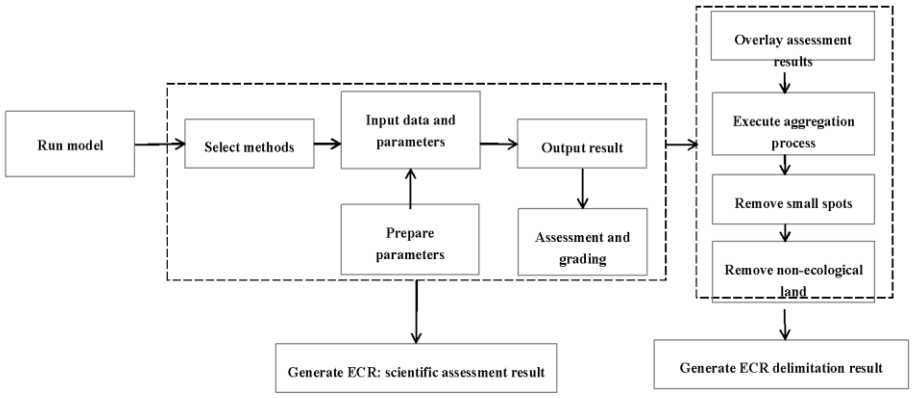

Figure 5-2. Operational process for an ECR software toolkit

The ECR software toolkit integrates the methods and processes of ECR delimitation. It has independent data models, adopted human computer interaction, which can assist in processing and producing the basic data and parameters delimited by ECR, evaluate the importance of ecosystem services, establish the ecosystem classification results, and finally generate boundary data of ECR. The ECR software kit is based on ESRI ArcGIS program running environment, and finally runs in the form of feasibility file *.exe file or *.tbx under the support of ESRI ArcGIS environment. The toolkit's functions mainly include: basic data management function for ECR, ecosystem function evaluation function, ecosystem importance classification function, ECR boundary optimization function and ECR mapping function. The design for the operation process of an ECR software toolkit is noted in Figure 5-2.

5.5 Suggestions on international promotion of ECR

China has made great efforts to protect, improve and restore its natural areas, biodiversity, integrity of ecosystems and their services. China also brings economic benefits to the rural people. Such efforts will be further strengthened in the Chinese 14th Five Year Plan and future plans. In particular, China's innovative ECR has played a key role in maintaining China's ecological security and sustainable economic and social development. The delimitation of ECR is an important measure to promote the ecological civilization construction and land spatial development pattern in China, which is also an important innovation of China's ecological environment protection system. At the CBD COP 15 China’s efforts will be highly valued and can be used to illustrate how to meet challenges and create new opportunities for economic and social well-being. At present, China is the only country in the world to delimit ECR. With the help of CBD, China should show the world its innovation and breakthrough for this type of ecological and environment protection, expound the function of the ECR on biodiversity protection, and possible use for delineating areas for carbon sequestration.

5.5.1 Integrating ECR to the nature-based solution to adapt to climate change.

Nature Based Solutions are an effective approach against climate change. Delimiting ECR is not only conducive to enhance the ecosystem stability and resilience, but also conducive to conserve and enhance the carbon sequestration function of the ecosystem and thereby address an important aspect of climate change. During the Climate Action Summit of the 74th UN General Assembly in September 2019, the Chinese government submitted a proposal to the assembly "delimiting ECR to mitigation and adaptation of climate change—action initiative for nature based solutions". According to the proposal, the existing

practice cases have proved that the purpose of "providing larger carbon sequestration services in a smaller area" can be achieved by determining the protection area with ECR.

We suggest that the Chinese government should further promote the implementation of the 2019 initiative. We could invite the parties of the UN Convention on Climate Change, the Convention on Biological Diversity, the Convention to Combat Desertification and other international organizations, non-governmental organizations and the private sector involved in biodiversity conservation. We will call on all parties to take active action to draw lessons from ECR practices and explore the provision and implementation of nature-based solutions as action initiatives for natural solutions to climate change. The above-mentioned measures can provide solutions for making a positive contribution to the global response to climate change and the realization of goals of the post-2020 Convention on Biological Diversity.

5.5.2 Introduce important carbon sink ecological function areas to achieve Chinese carbon peak and carbon neutral goals.

According to the ECR proposed by China, the important ecological function areas, such as water conservation, soil and water conservation, wind prevention and sand fixation, and the ecological sensitive areas, such as soil erosion, land desertification and rocky desertification, are basically included as important ecological functions in ECR delimitation. However, due to the absence of taking the ecological function of carbon sequestration as a separate part in the delimitation method, some important carbon sink areas have not been identified. They could be included in the ECR. In addition, marine and coastal carbon sequestration can also be improved by delimiting marine ECR such as mudflats, mangroves and offshore marine reserves.

The carbon sink acts as an essential approach to mitigate climate change and achieve natural response to climate change, from both international and domestic perspectives. China's ECR policy will be the first of its kind to scientifically protect nature. The original purpose of this policy is to protect areas with important ecological functions and fragility, restore wildlife populations, and protect human welfare from nature. Now we are exploring the potential of the ECR in improving carbon sequestration capacity and mitigating climate change. The ECR incorporates important carbon sink ecological function areas such as forests, grasslands, peatlands and permafrost lands into the scope of protection, which also contributes to climate action. We will further improve the results of the ECR delineation in accordance with the goals of carbon peaking and carbon neutrality proposed by China and contribute to China's effective response to climate change and the implementation of the United Nations Framework Convention on Climate Change.

5.5.3 Integrating ECR into a “Green BRI” to prevent ecological damage caused by development activities from happening in the first place

Most BRI countries are developing countries, which are in a critical period of balancing development and ecological protection. Pre-planning of protecting important ecosystems is an important means to avoid ecological disruption, and the delineation of ECR can solve this problem while reducing the ecological footprint of BRI countries. Therefore, we recommend promoting the experience and practice of China’s ECR to BRI countries, promote BRI countries to develop ECR-based policy frameworks and submit the policy frameworks as countries’ national strategies under the CBD and UNFCCC.

Although countries can and should adopt protection measures that suit their own circumstances, they can still learn a lot from China's ECR system, especially the use of scientific means for spatial planning that considers the overall ecosystem functions. We believe that China will continue the innovation and learning in the process of implementing this policy and provide experience for other countries. The "Belt and Road" initiative is a viable and ready-made way for China to share its ECR experience. China can help BRI countries to carry out ecological conservation work in a similar way as ECR delimitation.

6. Cross-Cutting Nature of Biodiversity: Mainstreaming and Synergies

This chapter examines how mainstreaming and synergy agendas could be further strengthened within the post-2020 global biodiversity framework (GBF) and in related preparatory documents.[20] It draws lessons for biodiversity mainstreaming from case studies in climate policy, the urban context, the financial sector and national economic accounting frameworks. Regarding efforts to enhance synergies, the report analyses the different sections of the CBD Updated GBF Zero Draft and highlights entry points for realising synergies with biodiversity-related conventions.

6.1 Mainstreaming biodiversity across government and society as well as enhancing synergies among environmental and sustainable development agendas are key contributions to realising a broader agenda for societal transformative change.

Both the Global Sustainable Development Report (2019) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2019) called for transformative change in order to lead us to a pathway for achieving the Sustainable Development Goals (SDGs) in 2030. The on-going development of the GBF needs to trigger the transformations identified by IPBES. While the synergies aspect touches upon the realm of biodiversity-related multilateral environmental agreements (MEAs) and organisations, the mainstreaming angle is thematic and aims at whole economic or societal sectors.

The GBF needs to lay the ground for successful mainstreaming efforts undertaken by international organisations, governments, and stakeholders. To further detail the mainstreaming agenda, the CBD COP 14 decided to establish a long-term strategic approach for mainstreaming biodiversity (LTAM). Also, an Informal Advisory Group (IAG) to advise the CBD ́s Executive Secretary and the Bureau on the further development of the proposal for a long-term approach, including on ways to integrate mainstreaming adequately into the GBF has been established.[21] Both aspects, mainstreaming and synergies, need to be anchored strongly in the outcome to be negotiated at the 15th COP of the CBD.

6.2 Building meaningful linkages between the GBF and the LTAM to strengthen the CBD ́s mainstreaming agenda.

The Updated Zero Draft, released by the co-chairs of the Open-Ended Working Group on the GBF in August 2020, addresses mainstreaming under the 2050 Goal B (Contributions of Nature to People) and Goal D (Means of Implementation). Further, several targets are highly relevant for the mainstreaming agenda, including target 4 on management of wild species, target 6 on pollution, target 7 on nature-based solutions to climate change, target 9 on managed ecosystems and agriculture, target 11 on green infrastructure, target 13 on integrating biodiversity values, target 14 on sustainability of economic sectors and businesses, target 15 on sustainable consumption and lifestyles and target 17 on incentives and resource mobilization.

While the GBF is directed at a more strategic level, the LTAM will provide further operational guidance to support the implementation of the GBF ́s mainstreaming elements. However, the concrete integration of the LTAM in the GBF and the follow-up of its implementation still need to be discussed. Some Parties fear that duplicate structures will be created and ambitious mainstreaming goals and efforts may be outsourced

[20] A team from the German Federal Agency for Nature Conservation (BfN) led by Lennart Kümper-Schlake, a member of SPS 1-2 Post 2020 Biological Conservation, prepared two discussion reports and a Special Technical Report on *The Cross-cutting Nature of Biodiversity: on the Role of Mainstreaming and Synergies in the Context of the Global Biodiversity Framework.*

[21] See various CBD papers including CBD/SBI/3/13/Add.1 14 April 2020 and CBD/SBI/3/13 31 August 2020

from the GBF to the LTAM. The upcoming rounds of negotiations prior to COP-15 will be crucial to clarify these points and to implement the necessary adjustments in the further development of GBF.

The LTAM and GBF intend to build upon potential synergies with other international agreements and conventions. These linkages are still under discussion and could be further elucidated in the GBF as well as in the LTAM. In the LTAM and its Action Plan, linked SDG targets are only partially included and could be emphasized more explicitly. Similar or aligned indicators for similar targets could be included in the GBF monitoring framework.

The LTAM does not explicitly single out economic sectors beyond finance, pointing to the financial sector ́s unique leverage for instigating change in other sectors. With its focus on GBF targets 13, 14, 15 and 17 as well as the financial sector, the LTAM focuses on the indirect drivers of biodiversity loss. The LTAM ́s lack of more specific guidance for other sectors and associated direct drivers has been criticised by some Parties and stakeholders. Similar concerns have been raised for the Action Plan, in which specific actions for the most relevant economic sectors should be outlined more clearly and proposed timeframes should be adjusted for more feasibility, according to some Parties.

The IAG argues that guidance on how mainstreaming in other economic sectors should take place was already provided during COP-13 and COP-14 as well as the IPBES global assessment (2019). However, the guidance provided during these two COPs is not coherent between sectors and therefore is likely insufficient to generate continued momentum and directionality for the respective sectors.

6.3 Insights from mainstreaming biodiversity in climate policy, the urban sphere, the financial sector and environmental accounting

While biodiversity is still insufficiently anchored in relevant policy areas and sectors, there have been promising developments in climate policy, urban planning, the financial sector and environmental accounting. In all four areas, it is a broad coalition of, among others, economic, political and civil society actors that has enabled initial mainstreaming successes. Insufficient data availability and lack of harmonised methods are currently still barriers to further mainstreaming in the areas of environmental accounting and the financial sector. In the urban sphere and climate policy, the integration of biodiversity is increasingly framed using the concept of Nature-based Solutions (NbS). In order for NbS to actually contribute to the conservation of biodiversity and its sustainable use, safeguard measures must be taken. This will ensure that biodiversity objectives are considered in the implementation process and are not inappropriately subordinated to climate and urban planning objectives. At the same time, NbS should not only be understood as measures that contribute to climate action but for all societal challenges that defined by IUCN, including health, provision of food and clean water, natural habitat degradation and natural disaster prevention.

To further promote actions by non-state and subnational actors such as financial sector institutions, businesses or cities, their contributions to the GBF would need to be made more visible. Doing so could enhance motivation by actors to showcase what they are already doing and create more accountability to complement governmental transparency efforts.

6.3.1 GBF Entry Points for strengthening biodiversity mainstreaming in *climate policy*.

The LTAM itself does not include many references to climate change while many of its actions bear relevance to climate without explicitly mentioning them. For instance, under action area 1 (biodiversity mainstreaming across policy and planning), the LTAM includes one indicator that specifically refers to climate change (mainstreaming biodiversity in national climate action plans). Under Action 1.2.1, the LTAM Action Plan suggests governments to "align their CBD, UNFCCC and UNCCD components" with respect to SDGs and the mainstreaming agenda.

If the GBF is to function as an overarching framework that highlights the fundamental relevance of biodiversity for achieving other societal objectives, mitigation and adaptation opportunities through biodiversity action should be anchored firmly in the GBF. This way, existing climate change policy, including Nationally Determined Contributions (NDCs), could come to be subject to biodiversity policy considerations, ensuring that measures to tackle climate change do not undermine the potential for achieving biodiversity goals. Giving NbS a strong role within the GBF can also help ensure that NbS are implemented in a way that they realise climate alongside biodiversity objectives. This way, the GBF could promote NbS that do not only comply with biodiversity safeguards but also generate nature-positive outcomes. Highlighting the benefits biodiversity generates in terms of climate adaptation and mitigation also opens up the possibility of accessing climate finance for biodiversity action.

6.3.2 GBF Entry Points for strengthening biodiversity mainstreaming in the *urban context.*

The GBF directly addresses the subnational level in target 11 (health through green and blue spaces) and target 13 (values). The GBF could further strengthen biodiversity mainstreaming at subnational level by broadening the scope of the GBF ś urban biodiversity target 11. Target 11 could not only refer to green/blue spaces, but also to biodiversity-inclusive urban planning, including building and infrastructures. Cities can also contribute to achieving a number of other GBF targets and SDGs.

When strengthening the linkages to urban biodiversity across a number of GBF targets, the multiple linkages with the SDGs can be emphasised and the corresponding SDGs' indicators could be referred to within the GBF. In particular, SDG 11 on resilient and sustainable cities includes targets on sustainable urbanisation and land use, protection of natural and cultural heritage, access to green spaces, the protection against climate change impacts, disaster, air pollution etc.

The use of the NbS concept is still under discussion within the GBF process itself. The pros and cons of the concept have been commented on especially compared to the use of the concept of "Ecosystem-based Adaptation" during first consultations on the Zero Draft. By using a NbS concept that highlights not only climate but also ecological, social or economic benefits, the GBF could strengthen perception and effective uptake of NbS as instruments for achieving multiple benefits within the urban context and beyond.

Finally, the GBF could refer to global reference indicators and monitoring frameworks thereby contributing to more coherence and better data availability and comparability. As of now, the urban sector is not fully represented in the target system and monitoring framework of the GBF and could be strengthened if supported by recognised standards. In one of its three strategic areas,

the LTAM addresses local governments and could benefit from the inclusion of specific urban elements to its Target 1.1. (on assessment, valuation, and accounting tools and methodologies) taken from newly developed NbS standards.

6.3.3 GBF Entry Points for strengthening biodiversity mainstreaming in the *financial sector*.

The role of biodiversity finance from public and private sources features prominently in the Updated Zero Draft as well as the LTAM and its Action Plan. The GBF includes a goal on green investments (D. 2030 Milestones, Goal B.2) and GBF targets 17 and 18 also directly relate to the financial sector and resource mobilisation from all sources.

The financial sector is the only sector for which the LTAM outlines a broad range of actions for all financial institutions. However, besides the goal on green investments, the GBF does not explicitly address private financial institutions at target level.

The GBF could further strengthen biodiversity mainstreaming within the financial sector by more explicitly including public-private collaboration and partnerships (cf. LTAM Action Plan 4.4) to facilitate the graduation of sustainable business models and generation of positive track records. These partnerships can provide de-risking tools for structural financial instruments pooling multiple biodiversity-related projects and bundling them into a single product with tailored risk and return profiles for investors. Further, the GBF needs to include more detailed guidance on developing a transparency framework for public and private biodiversity finance flows to enhance more consistent and comparable data on biodiversity finance.

6.3.4 GBF Entry Points for strengthening biodiversity mainstreaming in *national accounting.*

National accounting is firmly anchored in the GBF, the LTAM and its Action Plan. Following the System of National Accounts (SNA) approach ensures consistency (e.g., no double counting) by linking to economic processes, and thus relevance beyond the environmental policy sphere. By specifically referring to the UN System of Economic and Environmental Accounting (SEEA) framework, the LTAM and its Action Plan contribute to integrating ecosystem services into standard approaches to national accounting. LTAM Global Goal 1 focuses on ecosystem or natural capital accounting using the SEEA framework. However, calculating market prices for goods that are not traded on markets is challenging, and will not provide a comprehensive picture of the broad range of values of biodiversity, such as intrinsic or relational values (IPBES 2019; CBD-SBI 2020) which must be assessed by additional means.

In recent years, the United Nations Statistics Division has developed an ecosystem accounting methodology to complement the SEEA framework. In order to advance GBF implementation with respect to accounting, the SEEA framework should be applied taking into account three key considerations: First, accounting results need to be fit for purpose. Not necessarily one method fits all, but all accounting efforts need a clear definition of purpose, way of use and transparent methods, to enhance comparability. Hence governments may be well advised to provide a toolbox, offering tools that are fit-for-purpose for different policy tasks, from reporting to planning, regulating, investing and prioritising. Doing so would contribute to LTAM Action Plan action 1.1.3. Second, a clear communication about the kind of Ecosystem Accounting (EA) data required

is needed. This requires clarification which questions an EA is capable answering and which not. In particular, it is crucial that monetary data in the EA is not misread as representing "the value of nature". Third, data availability needs to be improved. This includes ecological and modelling knowledge of ecosystem processes, up to date in situ monitoring data for ecosystems and biodiversity, and related analytical tools helping to translate accounting data into policy advice. For mainstreaming and generating feasible, relevant and representative indicators, it is important that SEEA EA is implemented in coordination with those responsible for national biodiversity assessments. Doing so would contribute to LTAM target 1.1.

6.4 Seizing the opportunity of the GBF to enhance international biodiversity governance by making use of synergies

Over the last decade, countries have agreed to multiple sets of international biodiversity-related goals. For instance, the SDGs have strong biodiversity-focused elements at goal and target levels. In 2010, Parties to the CBD adopted the Aichi Biodiversity Targets, which have subsequently found endorsement and support throughout the UN system and beyond. Many thematic and institutional connections exist between multiple strategies and sets of goals and targets. The GBF provides a further opportunity for connecting strategies and goals of different multilateral environmental agreements, including the Land Degradation Neutrality objective of the United Nations Convention to Combat Desertification (UNCCD), the Strategic Vision 2021 - 2030 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CITES 2019) or the natural heritage sites of the World Heritage Committee (WHC).

Coherent and mutually supportive biodiversity strategies, goals and targets at the international level will foster cooperation, coordination and synergies at regional and national levels. After the GBF is adopted, the CBD Parties will be required to revise their National Biodiversity Strategies and Action Plans (NBSAPs). This revision provides opportunities to countries or regions to strengthen implementation of biodiversity-related conventions by making use of synergies. This includes monitoring, reporting and review of biodiversity, by revising legislation or by conducting capacity development activities, e.g., on communication of biodiversity or on minimizing trade-offs, for instance by applying NbS. Furthermore, NBSAPs can take a stronger role in mainstreaming biodiversity into different productive sectors like agriculture or tourism. For that, relating NBSAPs to the SDGs is an opportunity to link biodiversity with other policy areas and to create new narratives for the importance of biodiversity (Obrecht et al., 2021).

Cooperation at the level of secretariats of biodiversity-related multilateral environmental agreements is well established, however it is only institutionalised to a limited extent and governments play a small role so far. In order to make significant progress regarding the potential for synergies, governments and the entities within governments responsible for the different multilateral environmental agreements, need to take consistent and mutually supportive decisions in all conventions to which they are a party.

The on-going process of developing the GBF presents opportunities and options for enhancing synergies, cooperation and coordination – either in the text of the GBF itself or in multiple other decisions to be taken by the CBD COP-15, such as on the long-term strategic framework for capacity development, the monitoring framework for the GBF, on resource mobilisation and on knowledge generation, management and sharing. All those decisions are related to the GBF but there is a risk that they remain under the radar

of the negotiations of the GBF and governing bodies of biodiversity-related conventions other than the CBD have limited opportunities to engage.

A promising option to achieve mainstreaming and promote synergistic implementation of the GBF is the establishment of new or the revitalisation or expansion of existing joint work programmes by two or more multilateral environmental agreements and potentially other international organisations or partners. Such work programmes could be either thematic or linked to one or more new GBF targets and constitute implementation plans for the GBF. Such thematic and/or target-based work programmes would increase ownership of all actors with the GBF, set out milestones, clarify responsibilities and help managing GBF complexity.

6.5 Recommendations Summary on Mainstreaming and Synergies

6.5.1 Mainstreaming

In addition to area-based conservation measures, integration of biodiversity into other sectors and different types of decision-making (horizontal and vertical) is a prerequisite for a nature-positive development and transformational change. The mainstreaming of biodiversity should be strengthened in the CBD, at national and subnational levels and more generally within decision-making involving economic growth and development.

The mainstreaming agenda could feature more prominently in the Global Biodiversity Framework (GBF). **Sectors and non-governmental actors are addressed only indirectly, and not explicitly enough through targets and indicators in the Updated Zero Draft of GBF.** Further, the **relationship** between the Long-term Strategic Approach for Mainstreaming Biodiversity (LTAM), its action plan and the GBF needs to be further defined in order to enable transformative action. This is important to avoid duplicate structures and outsourcing ambitious mainstreaming goals and efforts from the GBF to the LTAM.
The LTAM could be further developed in such a way that it provides the conditions for the actors in the respective sectors to **organize themselves** and thus ensure necessary ownership. This way, the LTAM might set out a process on how the mainstreaming agenda could be further developed rather than aiming to define every aspect itself.

6.5.2 NbS and climate change in the GBF.

NbS as well as linkages with climate change could be strengthened throughout the GBF. First, the GBF could make better use of **Nature-based Solutions (NbS)** than currently reflected in the Updated Zero Draft. The Updated Zero Draft mostly refers to NbS in the context of climate objectives. As NbS can address a broader range of societal challenges beyond climate change, the GBF should highlight this by referring to NbS for instance in the context of **urban biodiversity** (target 11). Prominently including NbS in the GBF could help to (1) establish important **linkages to other environmental and societal agendas** and (2) ensure that **NbS are understood in a nature-positive way**, in line with the International Union for Conservation of Nature (IUCN) standard and other standards that go beyond "doing no harm" to biodiversity.

Second, the Updated Zero Draft refers to climate change objectives at goal and target level, with a focus on climate adaptation. If the GBF is to function as an overarching framework that highlights the fundamental relevance of biodiversity for achieving other societal objectives, **mitigation and adaptation opportunities**

should be anchored firmly in the GBF and its monitoring framework. For instance, linkages to climate change could be included/reflected into targets related to land use, oceans and agriculture.

6.5.3 Synergies

The GBF provides an important opportunity for connecting strategies and goals of various multilateral environmental agreements, including the Land Degradation Neutrality objective of the United Nations Convention to Combat Desertification (UNCCD), the Strategic Vision 2021 - 2030 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CITES 2019) or the natural heritage sites of the World Heritage Committee (WHC). **This opportunity should be used!**

The revision of the National Biodiversity Strategies and Action Plans (NBSAPs), which will be required upon adoption of the GBF, provides opportunities for countries or regions, including China, to strengthen implementation of biodiversity-related conventions by making use of synergies. This includes monitoring, reporting and review of biodiversity, by **revising legislation** or by **conducting capacity development activities**, e.g., on communication of biodiversity or on minimising trade-offs, for instance by applying NbS. Guidelines for NBSAP revision should consider the expertise of biodiversity related **Multilateral Environmental Agreements** (MEAs) as well as UN agencies and other international organizations.

7. Post-2020 Socio-Ecological Security, Resilience and Recovery[22]

7.1 Introduction

The crisis created by the Coronavirus (SARS-CoV-2) spreading COVID-19 disease world-wide reminds us once again that even the smallest forms of biodiversity can bring about devastating impacts for people, our globalized economies and society. COVID-19 came on suddenly, but may leave only gradually. 'Building back better' has become a global rallying call for a more resilient planet, communities and economics. But what does that actually mean? UNEP describes a situation of triple emergency for ecology and environment: pollution, climate change and biodiversity loss（United Nations Environment Programme, 2021）. To this we can add the major concern that action to address most of the 17 UN 2030 Sustainable Development Goals (UN2030SDGs) is lagging. For all of these SD Goals, including those directly concerned with biodiversity, progress has been slowed due to various factors, including gender inequities and gaps—a major point explored at length during recent decades, but still not sufficiently resolved. A big issue is the continued challenge of treating issues individually without full consideration of potential for co-benefits and synergies. This has certainly been the case regarding mutually supportive efforts between Climate Change, Biodiversity Conventions, and Public Health. 'One Health'（One Health, 2021）is an example—a convergence of valuable knowledge regarding links of animal health, public health and health of ecosystems but still limited in mainstream applications. The need for transformative change is well recognized, with many good ideas and accords, but not yet part of the mainstream of development.

[22] This chapter draws upon SPS 1-2 Working Papers available on the CCICED website or in progress: *Post-2020 BioSecurity: Global Emergency to Ecological Civilization* 57 pp. https://cciced.eco/ecological-progress/post-2020-biosecurity-global-emergency-to-ecological-civilization/ ; *Ecological Security* (in progress) ; and *Gender, Biodiversity and Ecosystems.* 19 pp. (draft completed 17 March 2021).

These problems should be tackled together. They share some common roots, including poverty, unsustainable patterns of resource use, overconsumption, failure to protect ecosystems, poor funding and other policy decisions by governments, limited participation by enterprises, and incomplete scientific knowledge. Almost always there is damage to biodiversity and ecosystems implicated either in terms of causality (e.g., 60 to 70% or more of epidemics and pandemics involve animals, disrupted ecosystems, invasive species), or via consequences such as destroyed economies leading to uncontrolled impacts on landscapes or species (e.g., wildfire, endangered species exploitation). COVID-19 has disrupted our whole way of life and thinking. But the precedents set in tackling this problem may also pave the way towards accelerated action and innovation for issues such as biodiversity conservation.

7.2 From Emergencies to Ecological Civilization[23]

Can the massive financial efforts for stimulus and recovery from COVID-19 be truly successful unless the efforts are dovetailed with other emergencies of our time to form a common cause for the future? We are at a stage now where we can seek reasoned answers. Since mid-2020 there has been a strong call for a "green recovery from the social, economic and other impacts of COVID-19." What should the framework be for such efforts, globally and within individual countries? Answering these questions is vital in 2021, when world attention is focused on a Summit on Food Security, COP 15 on Biodiversity, and COP 26 on Climate Change. By settling the decade's agenda for nature's restoration, much more can fall into place for positive sustainability outcomes from 2030 to 2050/2060. For China the transformational goal is to establish an *Ecological Civilization.*（Hanson，2019）

7.2.1 The theme of the CBD COP 15 meeting is *Ecological Civilization: Building a Shared Future for All Life on Earth.* However, emergencies of every type still require swift action as well as eventual recovery and restoration. For the massive expenditure on COVID-19, will the cumulative effects of action be net positive or negative on nature, climate change, and the future quality of life for people and the planet? We must take into account socio-ecological Planetary Boundaries[24] within which societies can safely exist and operate, such as a 1.5 to 2.0 degree Celsius global temperature rise, excess loss of terrestrial, aquatic and marine ecosystems that provide essential ecological services, etc. These Planetary Boundaries need to be linked to the social foundations upon which societies can define their needs for a high quality existence. Together these two approaches provide a socio-ecological conceptual model called 'doughnut economics'（Raworth，2017）. They define the bounds of "safe operating space" in which humanity may function sustainably.

7.2.2 The criteria for a stated stimulus and recovery can be defined in economic terms but often have been difficult to fulfill in an environmental way. This was the case of the financial emergencies in parts of Asia in 1997/1998 and in the follow-up to the global financial debacle created on Wall Street during 2007/2008. A prime example is the widely expressed goal of improving resilience after such serious disruptions. To address such consequences, it is necessary to look beyond the short-term. Mark Carney, well-respected international finance expert and UN Special Envoy on Climate Change, worries about the 'tragedy of the

[23] See Arthur Hanson. December 2019. *Ecological Civilization in the People's Republic of China: Values, Action, and Future Needs.* Asian Development Bank, No. 21 Working Paper Series.
https://www.adb.org/sites/default/files/publication/545291/eawp-021-ecological-civilization-prc.pdf
[24] Planetary boundaries and the socio-economic doughnut.

horizon', societal and political inability to find or act on sustainability paths. Often we cannot see clearly enough, or act upon the political and social pathways of change into a better future.[25]

According to a new report（O'Callaghan & Murdock，2021）by UNEP and Oxford University experts, USD14.6 trillion was committed to stimulus and recovery in 50 large economies during 2020. Most funding was spent on 'first aid' stimulus initiatives intended to avoid economic and public health disasters. Only USD1.9 trillion was allocated to longer term 'recovery-type measures'. Of this smaller amount, USD341 billion supported green recovery initiatives—less than 18%. The countries providing green support were almost exclusively among the richer nations. The EU has based its recovery efforts around the *2019-2024 European Green Deal* and is an exception to the general trend of some other countries and regions. The USA awaits action by the new administration. China is bundling its green efforts into relevant parts of the 14th Five Year Plan. In general, the hope for a smooth dovetailing of COVID-19 recovery funding initiatives with the global emergencies so far has not been well realized. This should be a matter of concern at both CBD COP 15 and at the UN Climate Change COP 26. The funding gap on biodiversity matters is estimated at an average of USD711 billion per year this decade（Paulson Institute，2020）. In 2019 biodiversity conservation global financing was estimated at USD 124 to 143 billion.

Fortunately, financial sector leaders such as Mark Carney, and others from business and organizations such as the World Economic Forum, and from development banks are becoming very engaged on the subject of green finance. They are being supplied by valuable recent studies on economic analysis of ecological services, environmental risks and innovative funding models.（Dasgupta, 2021）

7.2.3 Some integrated solutions are available but not used as well as they should be. A prominent example is *One Health*.[26] Its value is better recognized today by comparison to a half year ago. Appreciation of 'nature friendly' and 'nature positive' approaches to development, and the need for greater emphasis on restoring ecological services and improving their valuation in broader terms is central. Natural infrastructure and building natural capital are very much in the limelight. These and other topics are explored as the basis for longer-term green recovery.

The opportunities for working on *One Health*, and issues such as long-term biodiversity conservation in partnerships among countries, and with specific development relationships such as China and the Belt and Road Initiative (BRI), with ASEAN or other regional bodies such as ESCAP, and with international development banks such as the Asian Development Bank (ADB) or the AIIB need to be examined in the context of green recovery.

[25] Mark Carney, 2015; Mark Carney, 2021. *Values. Building a Better World for All.*

[26] https://www.ecohealthalliance.org/wp-content/uploads/2021/03/Biodiversity-and-Global-Health-Intersection-of-Health-Security-and-the-Environment.pdf ; see also https://worldonehealthcongress.org and https://ipbes.net/sites/default/files/2020-12/IPBES%20Workshop%20on%20Biodiversity%20and%20Pandemics%20Report_0.pdf

7.3 Resilience: Why So Important?

Kristalina Georgieva of IMF has noted that: "Green recovery is our bridge to a more resilient future." OECD indicates the Path to Recovery should be "Strong, Resilient, Green, Inclusive" with a focus on "Health, Jobs and Economy, Environment." C40 Mayors propose that: "The recovery must improve the resilience of our cities and communities." World Bank and the GFDRR:"$4.2 Trillion Can Be Saved by Investing in More Resilient Infrastructure."

7.3.1 This idea of resilience, ever popular, is now on the lips of *politicians* everywhere, and all types of *decision-makers*. Resilience is a puzzle for *scientists* (ecological resilience), a tool for *engineers* (where the term originated), a favorite word for *community leaders*, and used by *bankers* in relation to stress tests. We can talk about 'managing for resilience', contrasting resilience and vulnerability in disaster-prone areas, building a sustainable and resilient future, buffering shock and stress, building resilience after crossing tipping points, resilient supply chains, global financial resilience, responsibility for maintaining resilience (e.g., New York City 'Chief Resilience Officer'), 'resilient multilateralism' in regional organizations, 'grand strategies' of resilience as a guiding star for policymakers, water resilience, resilient societies, resilient workforces, etc. All these examples are of some potential value as we navigate our way through complex adaptive systems to "build better", "live sustainably", or *"boost resilience by shaping economies that can withstand everything nature throws at us."*

'Resilience' is a word like 'Nature'. People feel comfortable with these words. Individuals and institutions carry an image of their meanings, no matter how different they may be compared to their neighbors' or different sectors. Engineering resilience refers to how quickly an item under examination returns to a steady state after disturbance. Ecological resilience refers to various states of an ecosystem under stresses, rather than presuming that it may return to a steady state. Trade economists worry about such matters as supply chain resilience where there is concern over the weakest link collapsing. What constitutes 'a resilient city'? Answer: a city with a capacity to survive, adapt, grow, no matter what kind of chronic stresses and acute shock. A sponge city? Tropical cities protected from storm damage by mangroves? Other cities with upstream wetlands or floodplain lakes?

When it comes to pandemics, species at risk, coral bleaching, and many other biodiversity and ecosystem concerns, environment and natural resource issues, ecological and other types of modeling have been very helpful. In some applications, such a food security, resilience may be very helpful, even in complex multivariate circumstances. But as seen with fisheries management, poly-governance initiatives, and land management there are limitations on the use of resilience as a quantitative mechanism, or in development of longer-term scenarios.

7.3.2 At a global level, the problems are greater still. How resilient is the earth and its biosphere? These are questions that the Stockholm Resilience Center（Stockholm Resilience Center，2015）tries to answer, and has given useful advice on the Planetary Boundaries we should not transcend. But clearly information is still inadequate. The WBCSD has taken a dashboard approach based on need for long-term recovery, and to safeguard 'earth resilience'. This approach sets out ways for investing in nature to build resilience that reduces risks of disease, extreme events, and crossing tipping points.[27]

[27] https://www.wbcsd.org/Programs/Food-and-Nature/Resources/COVID-19-a-dashboard-to-rebuild-with-nature

IUCN has a framework of 'resilience thinking' to understand processes of ecosystem change requiring adaptability and transformability. In this context IUCN defines resilience "as the capacity of a system to recover from stress and disturbance while retaining its essential functions, structure, feedbacks and identity". Adaptability is capacity of human/biological actors to influence resilience; transformability is capacity of actors to create a fundamentally new system when social-economic or ecological factors make the existing system untenable. Resilient thinking, according to IUCN, is consistent with the 12 Principles of the Ecosystem Approach for equitable, inclusive and holistic management laid out in the Convention on Biological Diversity. IUCN's vision of "healthy, resilient ecosystems" is a means to "bind together diverse IUCN work areas such as species conservation, ecosystem restoration, governance including equity and rights, climate change adaptation, food and water security, and disaster risk reduction." Perhaps these observations are the clearest way to express how resilience should be reflected from an ecological/environmental point of view.

7.3.3 We are left with four questions that deserve to be considered in the discussions at CBD COP 15 and even more during the design of COVID-19 green recovery initiatives, and in the design of projects for sustainable development, food security, and One Health initiatives. (1) Can resilience be defined in an integrated fashion? (2) Can resilience be measured and monitored for success? (3) How can resilience be linked meaningfully to scale, sustainability or other objectives and outcomes? (4) Should we find more precise language than this term?

7.4 Gender Gaps

Gender equality is essential to the discussions at CBD COP15. There remain very significant inequities in all nations regarding the full participation of women in decisions affecting their own future, their access to opportunities to shape a safe and healthy environment, and to fully contribute their skills and views. This situation is to the detriment of all, since full restoration of the planet requires full participation of all people.[28] Clearly the road ahead between now and 2030 for will be complex with both opportunities and challenges. Gender considerations should be viewed in the most positive ways possible. Without full participation by women and girls the chance of fully achieving the biodiversity goals being proposed in the draft COP 15 GBF is likely to be small.

The Global Environmental Facility (GEF) describes the main issue as follows: "Women depend on and are direct users and stewards of natural resources, and in areas such as energy and food systems, women farm and produce most of the world's food supply. Yet they own less than 20% of the world's land, lack equal rights to own land in more than 90 countries, and commonly face more barriers than men to access markets, capital training, and technologies, and remain unrepresented in decision-making spheres at all levels. Women's needs, roles, and leadership have historically been unrecognized and undervalued, and persistent social and economic inequalities between men and women hold back today's prospects for sustainable development and sound environmental management."[29]

[28] This section is based on an SPS 1-2 Working Paper March 2021. *Gender, Biodiversity and Ecosystems. 19 pp.* Draft is available on request.
[29] https://www.thegef.org/topics/gender

7.4.1 At the High Level 25th Anniversary Commemorative Summit of the 1995 Beijing Women's Conference, UN Secretary-General Guterres said that despite gains such as education of girls, "the ambitious vision of the Beijing Declaration remains unfulfilled." He and several other leaders cautioned that the COVID-19 pandemic "could wipe out a generation of progress towards gender equality." However he hoped that the COVID-19 stimulus and recovery "is also an opportunity to put women front and center of the recovery. And that "women's full human rights and freedoms are fundamental to peace and prosperity on a healthy planet."

7.4.2 In preparation for the Commemorative Summit countries were asked to prepare a national report on progress on the 1995 Platform for Action, especially over the past five years.[30] China reported a number of positive items on gender and environment:[31] "Promoting gender equality and environmental protection is not only a constitutional requirement but also a basic state policy. In the past five years, these two major development themes have gradually formed a normalized interaction and an institutional intersection. The gender perspective is constantly being reflected in environmental conservation, protection and projects…there are still many "blind spots" in promoting gender mainstreaming in environmental policies and practices. Environmental legislation and policies do not often touch on gender equality and women's empowerment."

The report from China suggested: "*(1) incorporate a gender perspective in environmental legislation and policies development.* In legislation and policies development, potential policy barriers to gender mainstreaming should be identified. Also, social awareness among policy/decision-makers should be enhanced. *(2) further safeguard the rights of women and other beneficiaries to participate in environmental decision-making.* In environmental protection and ecological progress, the assessment of impacts on gender equality should be carried out. China will improve the gender awareness and capacity building of personnel in relevant fields, including financial support. *(3) further strengthen the collection, analysis and use of gender statistics in the environmental field."*

7.4.3 The preparations for CBD COP 15 have included extensive reviews and consultations regarding gender. In the 18 February 2021 Draft Outline of a Post-2020 Gender Plan of Action[32] three overarching goals are proposed, with several objectives under each and numerous global biodiversity framework (GBF) links noted. Goal 1: Women and girls have equal access to, ownership and control over biodiversity and ecosystem services and associated economic resources and services. Goal 2: Women and girls benefit equally from nature and biodiversity. Goal 3: Biodiversity policy, planning and program decisions address equally the perspectives, interests and needs of women and girls.

The CBD Secretariat has produced an excellent guide that is intended to provide biodiversity professionals everywhere with "concrete ideas and actions for progress in their work towards achieving gender and biodiversity objectives, goals and targets."（CBD Secretariat, 2019）The document brings the sometimes quite abstract policy thinking to ground level, while still retaining the value of maintaining a "gender lens"

[30] https://www.unwomen.org/en/csw/csw64-2020/preparations#national-level-reviews
[31] https://www.unwomen.org/-/media/headquarters/attachments/sections/csw/64/national-reviews/china%20english.pdf?la=en&vs=2346
[32] Abridged observations drawn from the Draft Outline of a Post-2020 Gender Plan of Action. 18 Feb 2021. https://www.cbd.int/gender/doc/cbd-towards-gender-responsive-post-framework-en.pdf

on biodiversity and ecological issues. It provides an important roadmap to navigate routes in ways that can produce outcomes.

7.4.4 Biodiversity conservation becomes real for most people at a community and landscape (or seascape) level. This point has not been lost on the many organizations actively supporting community-based conservation. Some such as the International Union for the Conservation of Nature (IUCN) and the World Wildlife Fund (WWF) have very active programs related to gender equity and empowerment of women.

IUCN has taken a leading role in tackling violence and gender topics, since these often relating these to natural resource disputes. A seminal IUCN publication on this subject (GBV, gender based violence) was produced in 2020 (Castañeda Camey et al., 2020). The forms of gender based violence include, among many others, intimidation and harassment, denial of rights, physical and sexual violence, kidnappings, and murder. Some of the worst abuses that take place are against indigenous peoples. Women often take on leadership roles in asserting these rights, but may pay a heavy price for their actions. In September 2007 the UN passed an almost universally supported *Declaration on the Rights of Indigenous Peoples*（United Nations, 2017）. Articles 21 and 22 of DRIP indicate that: "Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities." During the 2021 IUCN World Conservation Congress a World Summit of Indigenous Peoples and Nature will take place.[33] Its purpose is "to unite the voices of indigenous people from around the world to raise the awareness that enhanced measures are required to protect the rights of indigenous peoples and their roles as stewards of nature." The outcomes document from this Summit "will articulate a defined set of high-level results for indigenous-led conservation in the post-2020 era."

Community-based Conservation (CBC), as practiced by organizations such as WWF[34] and also by many development organizations such as ADB and the World Bank focus directly on needs of local communities and on supporting gender-positive initiatives. To some extent CBC represents a shift away from "fortress conservation" approaches where local people are sometimes blocked from resource use in the margins of parks, nature reserves or other protected areas. Instead there can be focus on co-management or joint management of at least some ecologically significant areas based on a combination of local knowledge and scientifically validated approaches. CBC should be based upon women's equality, full rights and participation in opportunities linked to the UN2030SDGs including those related to health, nutrition and education.

7.4.5 Biodiversity conservation relies on information technology, biotechnologies, marketing and other skills that were not imagined or readily accessible a decade ago. The pace of change will likely continue and accelerate. The World Economic Forum, with a focus on both gender parity issues and the fourth industrial revolution, argues the case for preparing now by attracting young women into eight clusters of professions deemed to be of critical importance for the economy of tomorrow. Of the eight clusters only people and culture (65%) and content production (57%) show a dominance of women. The three of greatest male dominance are data and AI (74%). Engineering (85%) and cloud computing (88%). Averaged over all clusters, males make up 61% by comparison to 39% female. WEF notes the need to narrow the gap by

[33] https://www.iucn.org/sites/dev/files/content/documents/ip_summit_note_jan_2021.pdf
[34]Delfin Ganapin, Practice Leader, Governance, WWF International. https://www.cbd.int/gender/doc/wwf-community-based-conservation-gender-equality-women-empowerment-en.pdf

"hardwiring gender parity into the future of work" by creating "incentives for women and girls to enroll in science, technology, engineering and mathematics (STEM) education…[and] to create an accelerated pathway for women to be hired into the highest-growth roles of the future."（World Economic Forum, 2019）

7.4.6 The case for making gender equality a leading objective for biodiversity conservation and ecosystem restoration is compelling. It is a socio-economic and ecological set of arguments including those related to climate change as well as biodiversity. Even more compelling is the human rights case for gender. It is simply wrong to deny one gender the opportunity to fully realize their potential to make a positive difference for future generations as well as for themselves. For indigenous peoples, it is hard to understand why UNDRIP, a declaration endorsed by most countries, is not being a more powerful basis for action regarding indigenous peoples and their communities. In general a much stronger effort is needed for monitoring initiatives to ensure good gender disaggregated data are available. This is essential for many reasons, but most importantly to determine whether progress on equality is accelerating, and whether adaptive planning and management changes are required.

Women everywhere should be seen in the fullest way possible to be important agents of change. This needs to happen throughout the current decade that is so important for environment and development. It will require gender positive and nature positive investments including those being made in the COVID recovery phase and also towards the green and technologically very advanced future economy. Girls today need to have good access to education and training in order to participate and lead. It is essential that both public and private sectors take a proactive approach in attracting and welcoming this next generation of well trained and qualified women into leadership roles.

The CBD Secretariat and many groups are well aware of the urgent need for removing the barriers slowing progress on gender equality as it relates to biodiversity and ecological services. There has been an inspiring effort and inputs on this subject in the prolonged preparations for COP 15. The challenge is not so much in getting the words right in a negotiated document. It is what happens afterwards that is such a worry. There no longer is a cushion of time. Implementation goals must be met on time, and if possible exceeded. National plans must incorporate and act on gender equality needs in more effective ways. This will require greater attention to innovative incentive systems and other means. The bottom line is that gender equity must be perceived and acted upon as an outstanding opportunity to move all of humanity towards a new more valuable and harmonious relationship with nature.

8. Overall Recommendations on Post-2020 Biodiversity Conservation

Momentum is building for the CBD COP 15[35] in Kunming, China. That it had to be postponed due to COVID-19 was viewed as a serious concern. However, the extra time has been used to good advantage, providing a stronger base of understanding about what is needed to reverse the steady worldwide loss of biodiversity and ecological services no later than 2030. The 2050 CBD vision is for people to be 'Living in Harmony with Nature'. Regrettably, almost none of the 20 Aichi Biodiversity Targets set at COP 11 for 2011-2020 were met. There is a strong and urgent sense that more can be done to make the strategic biodiversity conservation plan for this current decade both robust and feasible.

[35] 15th Conference of the Parties to the UN Convention on Biological Diversity

The Global Biodiversity Framework (GBF), the key negotiating document, has been strengthened during the past year, but more work remains. It is timely to now consider how to accelerate the pace of implementation. Mainstreaming biodiversity remains an important matter in decision-making. During 2020 more than 16 trillion dollars has been committed to stimulus and recovery from the COVID-19 emergency. Despite widespread calls for 'building back better', a green recovery is underway only on a very limited basis. The funding gap for biodiversity and ecological restoration remains large. Finding synergies among environmental and socio-ecological accords and initiatives is essential. Now more than ever mainstreaming biodiversity into development decisions is necessary.

Over the past three CCICED Annual General Meetings the Special Policy Study on Post-2020 Biodiversity Conservation has presented recommendations relating to COP 15 and to China's impressive efforts for improving and restoring ecological services and restoration, and biodiversity protection. Now, as COP 15 draws near, we particularly wish to look at some ways to ensure there is effective and rapid implementation of the GBF once agreed at the Kunming meeting. China has much to contribute at this meeting and in the years after. The theme of the CBD COP 15 is *Ecological Civilization: Building a Shared Future for All Life on Earth.* We hope the four main recommendations below will contribute to the success of such a broad undertaking. We also include a short list of suggestions for additional improvements to the draft GBF in Annex 2.

8.1 Strive towards highly effective implementation of the GBF 2021-2025.

The first several years of implementation are a make-or-break period to overcome the challenges identified regarding Aichi failures and also implementation difficulties of the Paris Climate Change Agreement, and the UN 2030 Sustainable Development Goals. Ways to do so include the following major points.

8.1.1 Ensure that every goal and target at global and national (NBSAP and NDC) levels is well supported by credible and operational indicators to assess progress and to make any necessary corrections quickly. Use the UN SEEA ecosystem and environmental accounting where possible to build compatibility regionally and globally. Assessment should also take into account linking biodiversity progress with selected UN SDGs.

8.1.2 Enrich efforts to mainstream biodiversity and build synergies, especially among multilateral environmental agreements (MEAs) including climate change, in rural vitalization and green urbanization initiatives, and major integrated and regional development programs.

8.1.3 Work cooperatively to explore and promote on a much larger scale the use of nature-based solutions and nature-positive economic and social development. This approach should not be limited to climate/biodiversity initiatives, and should become part of portfolios supported by governments, international development banks, local and regional commercial banks and other investment sources, private sector enterprises, and community-based organizations.

8.1.4 Link biodiversity and ecosystem science more strongly to public policy formulation, and to broader economic and social values such as those related to needs of indigenous people, conservation economics, circular economy, poverty reduction, removal of perverse subsidies, and alternative

measures of assessing societal wellbeing. These types of transformative thinking are already demonstrating their usefulness. They fit well with the Ecological Civilization and sustainability theme of CBD COP 15. However transitions must be accelerated early on if we expect major transformations by 2030 and beyond are to be successful.

8.1.5 Build a stronger case for dovetailing more funding linked to a green recovery from COVID-19 including support for biodiversity-related needs. The clearest case to be made is for adoption of a One Health approach in all countries for meeting plant and animal health needs and disease prevention while also investing in ecosystem health and human health. This provides the added benefit of reducing future risks of epidemics and pandemics.

8.1.6 Place more emphasis both before and immediately after COP 15 on the 'Long-Term Action to Mainstream Biodiversity' within and across sectors. This is noted by IPBES to be essential. The role of enterprises, private sector finance, technological shifts, etc., will be drivers of change. There is good buy-in by some bodies such as the World Economic Forum (WEF) and The World Business Council for Sustainable Development (WBCSD) and a growing number of political leaders, groups such as C40 cities, etc., but far too many decisions still neglect/undervalue biodiversity and ecological services.

8.2 Based on China's theory of Green is Gold and the practice of ecological civilization, promote the nature agenda to international platform and translate ambitions into practical actions

Based on China's theory of Green is Gold and the practice of ecological civilization, China has the opportunity to show leadership at international platform. China could join other global leaders such as the UNSG or the Leader's Pledge for Nature, at an appropriate time such as UNGA76, CBD COP 15, G20, or UNFCCC COP 26 to reinforce determination and ambition at a global level to meet the goal of building a new relationship between people and nature.

China could propose to host a Head of State side event before COP 15 drawing together the themes of triple global emergencies of biodiversity, climate and pollution. Such an event could also be linked to the need for global green recovery from COVID-19. Join other leadersto set a solid foundation for the implementation of all three Rio Conventions (UNCCD, UNCBD, UNFCCC) during the Decade of Restoration. Call for nature-based solutions linking China's great efforts over several decades on food, biodiversity, ecosystem recovery, and health, and its more recent ambitions regarding carbon neutrality. China also has the opportunity to strengthen its leadership at ministerial level, leading, guiding and converging global views for a GBF that is ambitious and can bring the needed changes to be nature positive in the next decade. Bilateral engagement at HoS/G, ministerial, diplomat and negotiators levels are all critically needed.
At the CBD COP15, China as a host country, can champion critical issues such as "mainstreaming biodiversity" building on China's own experiences and practices

8.3 Share with other countries China's experiences on implementation of Ecological Functional Zoning and related topics.

8.3.1 Introduce to other countries Ecological Conservation Redlining (ECR) as a major innovation for maintaining biodiversity and building ecological security nationally. At present it is believed that China is the only country in the world with such an integrated and systematic program for addressing green spatial planning in order to conserve most special ecological and biodiversity rich areas. ECR is the bottom line and lifeline to guarantee and maintain national ecological security. With the help of the CBD at COP 15, China could disseminate information and discuss mechanisms on how other nations might benefit from this innovative experience.

8.3.2 Incorporate important carbon sink ecological function areas into efforts to achieve climate change mitigation, and recognize other ways to use nature-based solutions. Biodiversity and climate change initiatives potentially can have substantial synergies. Changing land use values to recognize more carbon sequestration is good for climate change action and also can secure benefits for biodiversity. If more important carbon sequestration areas can be protected through ECR, it will assist China in meeting its carbon peaking and carbon neutral goals. The ECR methods should include carbon storage and sequestration as part of ecosystem services function when delimitating. Learning from China's efforts on carbon sequestration may also be of value to other nations. At the UNGA74, China submitted a proposal to the General Assembly to consider delimitation of ECRs for mitigation and adaptation for actions related to climate change by using nature- based solutions. It would be useful to consider following-up on this proposal, in particular through calling on a number of Global Conventions, international organizations, non-governmental bodies and the private sector draw lessons and arrange pilot initiatives.

8.4 Accelerate work towards social-ecological security, resilience, and gender equality for the health and wellbeing of all people on our One Planet.

The following five suggestions cover strategic matters that together will help to bend the curve from biodiversity catastrophe in 2030 to a solid road for recovery. (1) 'Building Back Better' must incorporate a strong social-ecological approach based on improvements for both people and nature at all levels from local to planetary. (2) Worthwhile concepts such as ecological and social resilience are backed by scientific reasoning, but to be fully operational require a much better basis of data collection and indicators for monitoring progress towards sustainability. (3) Spark innovation on many fronts to enhance biodiversity conservation plus ecological services and restoration. (4) Build stronger partnerships with development organizations and investors already deeply engaged in green recovery, green development and green growth. (5) Make gender equality a leading objective for biodiversity conservation and ecosystem restoration.

Annex 1. Table S1 Characteristics of each CBD party

The proportion of protected areas under four scenarios, CPZs coverage, the proportion of unprotected CPZs (unprotected CPZs/total CPZs), CEZs coverage and the proportion of unprotected CEZs (unprotected CEZs/total CEZs) for the 195 CBD country parties (excluding the European Union).

Countries	Scenarios				CPZs Coverage (%)	Unprotect-ed CPZs (%)	CEZs Coverage (%)	Unprotect-ed CEZs (%)
	Existing PAs (%)	Conservati-ve Target (%)	Moderate Target (%)	Ambitious Target (%)				
Afghanistan	0.2	0.8	8.4	31.4	99.9	99.8	31.4	99.5
Albania	17.5	22.0	27.0	27.0	99.7	82.5	20.6	46.4
Algeria	7.8	10.3	10.3	36.0	46.4	84.5	34.5	81.5
Andorra	34.2	67.3	67.3	67.3	100.0	65.8	63.3	52.3
Angola	7.0	7.0	9.3	67.2	94.2	92.6	66.7	90.2
Antigua and Barbuda	13.9	13.9	14.3	14.3	100.0	86.1	2.0	22.2
Argentina	8.4	21.5	27.7	33.4	98.0	91.6	29.6	84.4
Armenia	22.8	30.1	30.1	30.1	100.0	77.2	14.8	49.6
Australia	19.1	23.2	29.9	69.3	78.8	80.9	64.9	77.3
Austria	28.5	29.0	39.5	39.8	77.2	66.8	23.1	49.2
Azerbaijan	10.3	14.4	14.5	14.5	100.0	89.7	12.9	32.9
Bahamas	33.3	42.4	69.7	69.9	100.0	66.7	57.4	63.7
Bahrain	0.9	0.9	0.9	2.1	8.6	100.0	1.2	100.0
Bangladesh	4.7	6.7	7.2	7.5	99.1	95.4	5.5	50.5
Barbados	0.0	0.0	1.1	1.1	99.8	100.0	1.1	100.0
Belarus	9.3	9.3	9.6	20.5	46.9	86.7	16.1	69.4
Belgium	24.7	24.7	24.7	25.0	18.4	30.1	3.7	9.1
Belize	37.3	38.1	57.9	74.8	100.0	62.7	71.4	52.5
Benin	28.1	28.1	28.4	34.2	100.0	71.9	17.6	34.5
Bhutan	48.0	72.2	76.5	77.1	100.0	52.0	72.5	40.2
Bolivia	30.3	40.7	55.9	62.4	99.9	69.7	55.5	57.8
Bosnia and Herzegovina	1.7	5.3	33.2	34.6	66.9	97.8	33.5	98.4
Botswana	29.2	29.2	29.2	34.3	36.8	38.8	26.6	19.2
Brazil	29.4	35.4	42.5	45.8	89.1	68.9	40.2	40.9
Brunei Darussalam	44.2	70.7	74.6	76.6	99.7	55.6	73.8	43.9
Bulgaria	40.6	41.1	49.8	52.8	98.0	59.5	30.5	40.0
Burkina Faso	15.4	15.4	15.4	15.5	100.0	84.6	11.0	1.2
Burundi	7.4	7.9	8.0	9.5	93.1	92.1	6.1	33.7
Cambodia	25.9	38.1	45.6	45.6	100.0	74.1	42.2	46.6
Cameroon	11.3	17.0	28.5	68.9	97.9	89.3	66.4	86.8
Canada	10.3	10.3	20.6	50.4	60.9	88.4	46.2	86.9
Cabo Verde	3.0	33.0	33.3	34.5	100.0	97.0	33.3	94.8
Central African Republic	18.0	18.0	20.5	80.0	100.0	82.0	79.6	77.9
Chad	17.8	17.8	19.5	36.4	68.6	74.0	28.9	64.3
Chile	19.5	51.4	66.8	70.3	95.7	81.4	63.5	80.0

China	13.6	18.8	22.7	32.5	81.4	86.1	28.0	67.7
Colombia	14.9	35.2	53.0	56.7	97.3	84.8	53.9	77.5
Comoros	10.0	39.8	39.8	39.9	100.0	90.0	35.0	85.4
Congo	37.8	39.5	55.4	90.3	100.0	62.2	86.3	60.7
Cook Islands	0.0	20.9	21.3	21.3	96.5	100.0	21.3	100.0
Costa Rica	27.5	37.2	37.8	37.9	100.0	72.5	30.9	33.7
Cote D'Ivoire	22.8	23.8	24.5	43.3	100.0	77.2	31.4	65.0
Croatia	36.8	40.3	44.8	45.3	54.5	41.8	25.4	33.6
Cuba	15.3	17.7	18.8	18.8	100.0	84.7	14.0	25.6
Cyprus	36.9	39.7	39.7	39.7	100.0	63.1	10.9	25.1
Czech Republic	21.8	21.8	21.8	22.0	10.8	8.3	5.0	4.4
Democratic People's Republic of Korea	2.2	2.2	2.8	46.2	99.1	97.9	45.0	97.8
Democratic Republic of the Congo	13.7	24.9	41.3	78.1	99.2	86.2	76.5	84.2
Denmark	15.7	15.7	15.7	16.1	8.8	23.4	2.6	15.4
Djibouti	1.3	1.5	24.7	28.7	99.9	98.7	27.3	100.0
Dominica	21.5	22.3	31.5	31.6	100.0	78.5	25.9	39.0
Dominican Republic	25.9	29.0	29.7	29.7	100.0	74.1	23.3	16.3
East Timor	15.5	20.7	20.7	20.7	100.0	84.5	10.1	51.6
Ecuador	21.4	40.0	47.6	50.4	100.0	78.6	46.6	62.1
Egypt	11.2	11.2	11.6	15.9	8.5	84.8	5.7	82.8
El Salvador	9.2	13.8	13.8	13.9	100.0	90.8	5.6	82.4
Equatorial Guinea	19.2	23.1	81.4	81.4	100.0	80.8	80.3	77.4
Eritrea	4.9	5.3	21.6	26.2	100.0	95.1	26.1	81.5
Estonia	18.6	18.6	20.0	55.5	99.0	81.4	50.8	72.7
Eswatini	4.1	4.6	4.7	4.7	100.0	95.9	4.2	15.6
Ethiopia	17.6	19.9	23.1	25.7	99.6	82.7	13.0	61.9
Federated States of Micronesia	0.0	39.6	39.7	39.7	99.7	100.0	39.7	100.0
Fiji	3.6	57.0	57.2	57.2	100.0	96.4	56.2	95.3
Finland	12.9	12.9	13.0	14.3	8.7	28.0	7.3	19.0
France	29.7	30.6	36.4	38.6	36.7	48.9	20.4	43.8
Gabon	23.4	39.7	74.7	93.5	100.0	76.6	91.2	77.0
Gambia	4.1	4.1	4.7	6.0	83.8	95.3	2.1	89.8
Georgia	9.3	41.3	41.3	41.3	100.0	90.7	40.5	78.9
Germany	36.6	36.6	36.6	36.9	26.3	50.4	3.1	12.2
Ghana	15.1	15.8	16.4	27.7	100.0	84.9	21.6	58.4
Greece	34.6	43.1	48.9	49.2	99.1	65.2	31.2	46.6
Grenada	10.0	11.3	15.6	15.9	100.0	90.0	12.7	46.8
Guatemala	19.9	33.9	36.9	39.0	100.0	80.1	30.8	62.1
Guinea	34.4	35.4	37.8	53.5	98.8	65.3	31.5	60.5
Guinea-Bissau	16.0	16.0	19.5	26.9	80.7	82.9	15.4	70.4
Guyana	8.8	37.9	63.2	95.6	99.2	91.2	95.5	90.9
Haiti	7.0	7.3	7.3	7.3	100.0	93.0	1.2	31.0
Honduras	23.7	33.7	39.2	42.1	100.0	76.3	36.9	50.1
Hungary	22.6	22.6	22.6	23.1	15.2	19.1	5.8	9.3

Iceland	19.4	19.4	25.7	92.1	89.6	86.8	82.4	88.3
India	5.6	7.2	7.5	8.9	94.4	94.2	7.2	45.3
Indonesia	11.8	40.9	49.9	52.1	99.6	88.2	51.1	78.9
Iran	7.2	7.6	8.6	27.3	99.6	92.8	24.1	83.3
Iraq	1.5	2.0	3.0	15.5	67.2	97.8	14.7	95.3
Ireland	13.6	13.6	13.6	13.7	3.7	33.5	0.9	13.9
Israel	19.5	19.9	19.9	27.2	59.5	84.7	14.0	54.3
Italy	21.2	22.6	31.7	32.8	99.3	78.7	24.3	47.6
Jamaica	15.4	22.6	23.0	23.0	100.0	84.6	15.2	49.7
Japan	20.5	21.2	36.2	49.2	98.4	79.7	43.4	66.1
Jordan	2.3	2.6	5.9	29.4	51.6	96.3	28.8	94.0
Kazakhstan	3.3	5.6	22.9	62.3	96.3	96.7	61.1	96.6
Kenya	12.4	13.0	13.3	15.9	84.0	85.7	9.5	37.8
Kiribati	25.6	25.6	25.8	25.9	98.2	73.9	0.5	66.7
Kuwait	16.5	16.5	16.8	34.2	90.2	85.4	30.1	58.9
Kyrgyzstan	7.0	47.1	47.1	47.1	100.0	93.0	43.3	92.8
Laos	16.8	42.4	49.3	65.3	100.0	83.2	62.9	77.3
Latvia	17.9	17.9	18.4	56.7	100.0	82.1	51.4	75.4
Lebanon	2.7	6.7	6.7	6.7	100.0	97.3	4.5	89.0
Lesotho	0.6	2.3	2.4	2.4	100.0	99.4	2.3	78.8
Liberia	4.0	42.2	42.2	42.2	99.2	96.3	41.0	93.4
Libya	0.3	1.4	1.6	20.8	25.7	99.3	20.5	99.9
Liechtenstein	38.7	38.7	46.7	46.7	100.0	61.3	31.3	25.5
Lithuania	17.0	17.0	17.3	28.0	69.4	80.4	18.6	59.3
Luxembourg	51.0	51.0	51.0	52.3	17.8	17.2	11.1	11.7
Madagascar	5.5	37.4	37.4	37.4	100.0	94.5	35.4	90.0
Malawi	22.5	22.8	23.6	25.4	62.1	70.1	13.2	22.2
Malaysia	18.3	47.6	55.3	55.6	99.5	81.7	50.0	74.6
Maldives	0.6	0.6	0.6	1.1	38.0	98.5	0.6	100.0
Mali	8.0	8.0	8.5	22.5	58.8	86.5	18.9	76.2
Malta	22.5	22.8	29.4	29.7	71.5	79.2	12.0	60.5
Marshall Islands	3.6	3.6	3.6	4.6	88.2	96.5	1.5	66.7
Mauritania	0.6	0.6	0.9	44.2	62.4	99.1	44.2	98.8
Mauritius	3.4	12.3	13.0	13.0	98.8	96.6	12.7	75.9
Mexico	14.5	22.9	29.4	33.5	99.9	85.6	26.0	73.4
Monaco	25.0	25.0	37.5	37.5	100.0	75.0	12.5	100.0
Mongolia	17.3	17.6	35.4	55.5	83.7	85.9	48.9	78.3
Montenegro	8.0	19.9	50.5	50.9	99.7	91.9	47.3	90.7
Morocco	28.6	38.5	39.1	48.4	100.0	71.4	35.6	55.7
Mozambique	21.2	22.7	26.4	39.3	61.8	75.9	28.4	63.4
Myanmar	6.4	44.3	52.2	52.2	99.9	93.6	52.0	88.2
Namibia	37.8	38.7	43.8	57.5	55.1	46.6	42.1	46.7
Nauru	0.0	0.0	0.0	0.0	0.0	-	0.0	-
Nepal	23.5	24.2	25.2	31.4	99.7	76.5	20.8	38.3
Netherlands	21.6	21.7	21.8	22.5	10.3	31.7	5.7	14.5
New Zealand	32.1	35.4	37.0	37.3	99.5	67.8	29.3	17.8

Nicaragua	37.1	37.9	47.4	48.9	99.5	62.8	28.4	41.7
Niger	17.6	17.6	17.8	28.8	52.4	78.0	21.6	51.9
Nigeria	13.9	14.3	16.5	28.5	97.9	86.4	20.0	73.1
Niue	0.0	66.3	66.3	66.3	98.9	100.0	66.3	100.0
Norway	16.7	16.7	18.1	58.7	67.1	77.8	55.7	75.5
Oman	2.6	5.2	6.8	29.4	53.5	95.2	29.3	91.7
Pakistan	11.0	11.1	12.3	25.9	88.9	92.4	19.6	76.2
Palau	30.5	64.3	64.3	64.3	99.8	69.7	45.3	74.7
Panama	19.7	36.7	44.7	48.2	99.9	80.3	46.0	62.2
Papua New Guinea	3.0	41.7	74.2	79.4	99.0	96.9	78.5	97.2
Paraguay	14.2	16.1	27.7	28.7	100.0	85.8	26.0	55.8
Peru	21.5	41.9	61.3	65.8	100.0	78.5	63.2	70.1
Philippines	15.1	28.2	28.2	28.3	99.7	84.8	23.9	54.9
Poland	39.6	39.6	39.6	40.0	21.7	17.5	6.1	6.3
Portugal	22.3	22.5	29.3	29.3	84.8	75.5	11.7	59.4
Qatar	12.0	12.0	12.0	22.5	41.8	88.3	14.0	75.1
Republic of Korea	14.9	14.9	14.9	23.6	96.0	85.3	15.7	55.1
Republic of Moldova	3.6	3.6	3.6	4.5	52.6	95.2	1.1	73.6
Republic of North Macedonia	9.2	10.4	15.6	28.2	100.0	90.8	25.6	74.3
Romania	24.3	24.3	24.4	28.4	61.3	66.9	10.9	38.0
Russian Federation	9.0	10.8	21.9	54.5	66.2	90.2	51.4	88.6
Rwanda	9.0	9.4	9.5	9.8	100.0	91.0	8.4	9.0
Saint Kitts and Nevis	20.4	20.8	21.5	21.5	100.0	79.6	1.1	100.0
Saint Lucia	15.6	15.6	15.6	15.6	100.0	84.4	0.0	-
Saint Vincent and the Grenadines	21.9	26.5	33.4	33.4	100.0	78.1	30.2	38.2
Samoa	4.7	29.8	29.9	29.9	100.0	95.3	27.3	92.3
San Marino	0.0	0.0	1.7	1.7	100.0	100.0	1.7	100.0
Sao Tome and Principe	28.4	54.1	54.2	54.4	100.0	71.6	52.5	49.4
Saudi Arabia	4.7	8.6	8.7	10.7	13.5	86.1	7.5	80.0
Senegal	25.5	25.5	25.9	33.0	98.4	74.3	19.2	39.1
Serbia	7.6	8.5	16.0	24.8	76.2	90.5	22.0	77.9
Seychelles	36.0	41.3	41.3	41.3	100.0	64.0	8.7	61.9
Sierra Leone	10.7	17.5	17.9	26.5	91.4	89.4	20.9	75.3
Singapore	4.2	6.9	8.1	8.3	97.1	95.6	6.3	64.9
Slovakia	37.3	37.3	37.7	42.4	48.0	34.4	23.9	21.5
Slovenia	53.3	56.4	57.3	57.6	70.5	37.3	27.6	15.4
Solomon Islands	0.6	69.6	71.2	72.9	97.3	99.4	72.6	99.6
Somalia	0.0	4.1	4.4	4.4	100.0	100.0	4.4	100.0
South Africa	7.7	16.0	30.9	31.1	85.3	91.4	28.1	83.2
South Sudan	16.3	16.3	17.7	32.5	100.0	83.7	27.4	59.2
Spain	27.7	30.0	33.2	33.5	90.5	70.7	14.2	40.4
Sri Lanka	29.5	31.6	36.4	36.4	100.0	70.5	32.3	21.3
State of Palestine	8.4	9.6	9.6	9.7	89.0	91.3	3.6	34.7
Sudan	2.8	2.8	2.9	12.9	61.1	96.8	10.8	93.3

Suriname	11.3	48.8	74.7	96.0	100.0	88.7	95.7	88.5
Sweden	13.8	13.8	14.2	28.6	40.8	77.8	22.3	66.2
Switzerland	6.9	10.3	28.2	28.9	100.0	93.1	26.4	83.2
Syrian Arab Republic	0.7	0.8	0.9	1.1	98.1	99.3	0.5	99.7
Tajikistan	19.0	57.8	58.2	58.3	100.0	81.0	53.7	73.1
United Republic of Tanzania	37.7	39.3	42.0	48.6	94.7	60.4	35.8	30.3
Thailand	18.7	21.0	26.2	28.2	99.8	81.3	26.9	35.4
Togo	24.5	24.5	26.9	31.8	100.0	75.5	14.9	49.1
Tonga	8.6	22.2	22.2	22.2	96.5	91.1	15.8	85.7
Trinidad and Tobago	30.1	30.1	30.1	34.5	21.5	28.8	18.7	23.6
Tunisia	7.9	11.0	11.2	44.6	97.3	92.2	40.6	90.5
Turkey	0.2	8.9	11.2	11.4	100.0	99.8	11.2	99.6
Turkmenistan	3.1	3.3	3.5	3.5	97.9	96.8	3.0	13.5
Tuvalu	0.0	0.0	0.0	0.0	90.9	100.0	0.0	-
Uganda	15.9	16.1	16.4	21.1	86.6	81.9	14.9	34.7
Ukraine	4.0	4.3	4.5	8.5	69.5	96.4	5.8	77.4
United Arab Emirates	17.7	17.7	17.7	20.1	21.1	83.8	3.5	69.7
United Kingdom	27.6	27.6	27.6	28.1	9.9	15.6	5.5	9.6
Uruguay	3.5	3.6	3.6	4.0	99.9	96.5	0.7	74.6
Uzbekistan	3.3	3.6	5.9	6.0	95.3	96.5	4.6	58.3
Vanuatu	4.2	64.0	64.5	65.5	100.0	95.8	64.2	95.5
Venezuela	53.4	61.9	71.4	73.2	84.5	45.5	58.2	34.0
Viet Nam	7.5	27.2	30.2	30.4	99.9	92.5	29.1	78.7
Yemen	0.5	11.7	13.2	13.3	56.6	99.0	13.0	98.3
Zambia	37.9	38.0	39.4	61.7	73.7	60.5	45.4	52.5
Zimbabwe	27.1	27.4	27.5	28.0	31.9	60.4	7.6	11.0

Annex 2. Additional comments on improvements to the text of the draft GBF

We recommend that the comments below plus the full text from the draft or final SPS 1-2 Summary Report 2021 might be shared informally with relevant drafters prior to the CCICED AGM. Otherwise the comments may not be received in a timely enough fashion to be useful.

Comment 1. The theme of COP 15 should be reflected in the background paragraph of the draft GBF. It could read at the end of this background paragraph: "Ecological Civilization would be a good sample for transformative change that specifies conservation strategies and action plan to implement the GBF.

Comment 2. In addition to the access and benefit sharing (ABS) protocol, biosafety protocol should be part of the 2030 milestones too. (even though a separate document on biosafety implementation has been developed.) Regarding the COVID-19 pandemic and other biosafety /biosecurity matters of biotechnology, and new emerging zoonotic diseases should be dealt within the context of sustainable development and One Health.

Comment 3. Combine Goal C (1) & (2) and replace Goal C (2) by biosafety elements.

During the twenty-fourth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA-24) discussed the updated zero draft of the post-2020 global biodiversity framework， some proposed revisions were raised as summarized below, which are however not or not fully addressed in the new released first draft:

- A better logical flow is needed between the Vision, and the proposed mission, goals, milestones, targets and indicators in the post-2020 global biodiversity framework. The structure of the framework should be simplified and that overlaps between the goals, milestones and targets should be avoided or minimized. In addition, the development of a follow-up to the Global Strategy for Plant Conservation 2011-2020 shall be taken into account. No agreement is reached to use the period from 2011 to 2020 as the reference period. Three concepts were proposed to addressing baseline issues—reference reporting period, baseline condition and baseline period.
- Overlapping shall be avoided. Potential overlapping exists in the framework between goals and targets, e.g. Goal C and Target 13. Overlapping exists also between targets, e.g. target 8 & 11, targets 5 &9.
- Terms or concepts used in the updated zero draft that needed further clarity, agreed definitions or scientific information, such as healthy and resilient populations, ecological connectivity, integrity, spatial planning, other effective area-based conservation measures, priority sites, priority species, overconsumption and responsible choices.
- It is inappropriate to use the term "nature's contributions to people" in Goal B and other places, the term "ecosystem services" should be used instead. The focus on people was inappropriate.
- Scientific evidences are insufficient for the percentages set in goals and targets, such as 5%（A.1）and 50% (target 6).
- For target 17, Some parties suggested that the target wording should address the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress, thus we could consider adding this proposal to enhance the implementation of this supplementary protocol.
- In the COP14 decision (14/29), the parties recognize that parties need to strengthen their implementation and commitments to achieve the 2050 Vision. Regarding of the Parties' calls for synergies with other multilateral environmental agreements and the COP 14 decision (14/5) that recognizes the interaction and synergy role between biodiversity and climate change and NDCs have been already set up by the UNFCCC, we propose to add one target:

"Target 22. By 2030, support all stakeholders, including government and non-government actors, to develop and present their own voluntary biodiversity commitments that are integrated into or in addition to their NBSAPs with the aim to support and increase the level of ambition needed to achieve 2050 Vision."

- Most of the headline indicators have strong support from Parties according to an in-session online survey regarding of the proposed headline indicators in the draft of the monitoring framework as presented in document CBD/SBSTTA/24/3/Add.1. Some Parties suggest that the indicators and the goals and targets shall be developed together to ensure that they are measurable. Some note that the use of headline indicators shall not prevent Parties from using other indicators and that the headline indicators shall have flexibility to allow them to account for national circumstances. SBSTTA-24 proposed that the final version of monitoring framework shall be finalized by the Conference of the Parties at its fifteenth meeting (COP15) and to finish its development at COP16. An AHTEG on Indicators for the Post-2020 Global Biodiversity Framework will be established after COP15 to address related issues.

Annex 3. Specific recommendations to the first GBF Draft

D. 2030 Milestones

1. Both biosafety protocol and access and benefit sharing (ABS) protocol shall be part of the milestones in addition to those of biodiversity conservation in the post-2020 GBF, although separate document on biosafety implementation plan has been developed. Regarding of the outbreak of COVID-19 pandemic, biosafety and or biosecurity of biotechnology and new emerged zoonotic diseases shall be adequately dealt for sustainable development and human health. We propose to combine Goal C (1) and Goal C (2), which would be also taken care of in Target 13, and to replace Goal C (2) by biosafety elements.

Goal C

C. 2 Biosafety and biosecurity are ensured;

E. 2030 Action Targets

2. Target 17. Establish, strengthen capacity for, and implement measures in all countries to prevent, manage or control potential adverse impacts of biotechnology on biodiversity and human health, reducing the risk of these impacts.

Biotechnology is developed by people to meet the request of people, thus people need have the power to control any adverse impact. Not every biotechnology application with potential benefits shall be necessarily applied and used. Those applications may add additional burdens to biodiversity conservation and human health and have to balance with their benefits. The target may not aim for reducing impacts but limit the application that having adverse impacts. The indicators for assessment and monitoring shall include, as suggested in Annex I (Proposed Headline Indicators for the Post-2020 Global Biodiversity Framework) of the document CBD/SBSTTA/24/3 and those scoring indicators in CBD/SBSTTA/24/INF/16, necessary legal, administrative, technical and other biosafety measures in place to reduce adverse impacts to biodiversity and human health by proper management for inspecting the application of biotechnology and the release of LMO that are harmful to biodiversity and human health. This can be translated into the extent of capacity-building/capacity development of the Biosafety Protocol. This target can be revised to

"Establish, strengthen capacity for, and implement measures in all countries to prevent, manage or control potential adverse impacts of biotechnology on biodiversity and human health, reducing the risk of these impacts, and to enhance implementation of the Biosafety Protocol and the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress".

3. Target 21: Ensure equitable and effective participation in decision-making related to biodiversity by indigenous peoples and local communities, and respect their rights over lands, territories and resources, as well as by women and girls, and youth. It is necessary to promote the participation of indigenous peoples and local communities, women and girls as well as youth. However, when talking equitable participation in decision-making, the role of men and the whole society cannot be absent either as reference for the equitable participation or obligated contributors to the process. We propose to revise this target to

"Through a whole-of-society approach, Ensure equitable and effective participation in decision-making related to biodiversity by indigenous peoples and local communities, and respect their rights over lands, territories and resources, as well as by women and girls, and youth, in accordance with national circumstances."

4. In the COP14 decision (14/29), the parties recognize that parties need to strengthen their implementation and commitments to achieve the 2050 Vision. Regarding of the Parties' calls for synergies with other

multilateral environmental agreements and the COP 14 decision (14/5) that recognizes the interaction and synergy role between biodiversity and climate change and NDCs have been already set up by the UNFCCC, we propose to add one target:

"Target 22. By 2030, support all stakeholders, including government and non-government actors, to develop and present their own voluntary biodiversity commitments that are integrated into or in addition to their NBSAPs with the aim to support and increase the level of ambition needed to achieve 2050 Vision."

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