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Priorities for progress towards Sustainable Development Goal 15 'Life on land'

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This year marks the mid-point for the implementation of the United Nations 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals, including Sustainable Development Goal 5 'Life on land'. We asked a range of researchers, working across biodiversity science, conservation, policy and implementation, to reflect on priorities for action on conserving terrestrial and freshwater ecosystems over the next seven years.

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In September this year, heads of state and governments gather in New York, USA for the 2023 Sustainable Development Goals (SDGs) summit — convened by the United Nations (UN) General Assembly — to discuss pathways for accelerating progress towards meeting the 17 SDGs. The overarching goal of SDG15 ('Life on land') is to "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss", yet recent global assessments, such as those of the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), have revealed that terrestrial and freshwater biodiversity is in a perilous state, driven by land-use change, over-exploitation, climate change and pollution. In this Viewpoint, eight researchers and practitioners (Box 1) across seven countries discuss what measures need to be taken to bend the curve of terrestrial biodiversity loss over the coming seven years and beyond.

H. David Cooper: implement the Kunming-Montreal Global Biodiversity Framework

Biodiversity underpins ecosystem functioning. Its protection and wise use are essential for planetary stability and human well-being. Achievement of SDG15 (as well as SDG14 ('Life below water')) is thus fundamental for progress across the entire '2030 Agenda for Sustainable Development'.

Progress towards the targets of SDG15 has been too little and too slow. As with most of the SDGs, we are woefully off track. The Kunming-Montreal Global Biodiversity Framework (adopted in December 2022 under the Convention on Biological Diversity), which has the mission to halt and reverse the loss of biodiversity by 2030, is intended as a contribution to the achievement of the SDGs. It includes four outcome-oriented goals for 2050 (focused on nature, nature's contributions to people, fair sharing of benefits and investment) and 23 action-oriented targets for 2030.

Urgent action is needed now to implement this ambitious plan and, thereby, its contributions to the SDGs.

Success will depend on a number of factors that were identified in light of the lessons learned from the earlier Aichi Targets and are reflected in the new framework. Key among them are that:

(1) Implementation requires a whole-of-government, whole-of-society approach. Addressing the drivers of biodiversity loss requires action across all government ministries and all sectors of the economy. It will need engagement of businesses, financial institutions and civil society.

(2) Indigenous peoples and local communities have an outsized role in protecting nature, as custodians and often as defenders of the environment against powerful vested interests. Their roles must be recognized and supported, and their rights must be respected.

(3) Policy measures work. Notwithstanding insufficient progress in the past decade, numerous examples point to the effectiveness of policy measures when implemented. Examples range from specific species recovery plans through sector-wide fisheries management to whole-of-government plans to combat deforestation. The recently observed marked falls in Amazon deforestation following the renewed plan to combat deforestation in Brazil are a case in point.

(4) Major investments are needed in finance and capacity. The new framework calls for US $200 billion per year to be raised from all sources, including $20 billion per year from developed to developing

BOX 1

The contributors

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Musonda Mumba is a wetland ecologist with a PhD from University College London (UCL) and is currently the Secretary General of the Convention on Wetlands, based in Gland, Switzerland. She has over 25 years of experience of working in the multilateral space, focusing on climate change, water resources management, gender, sustainable development and integrated landscape management with a passion for systems thinking. In her current role, she provides strategic support to 172 contracting parties from across the world.

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Xiaoli Shen is an associate professor at the Institute of Botany, Chinese Academy of Sciences. Her research focuses on understanding human impacts on species (mammals and birds) and ecosystems (forests) to inform their management and conservation.

Keping Ma is a professor at the Institute of Botany, Chinese Academy of Sciences, and Chair for Asia Regional Members Committee, IUCN. His research is related to mechanisms of species coexistence based on large forest dynamics plots, biodiversity–ecosystem function relationships based on large forest experimental plots, and large-scale conservation policies.

Rachel Wynberg is a professor in the Department of Environmental and Geographical Science at the University of Cape Town in South Africa, where she holds a research chair focused on environmental and social dimensions of the bio-economy. She has been involved in research and policymaking relating to access and benefit sharing since the inception of the Convention on Biological Diversity in 1992, advising governments, civil society organizations and international agencies. With a background in both the natural and social sciences, her interdisciplinary research spans topics relating to biopolitics and the biodiversity-based economy, sustainable agricultural futures, and social and environmental justice.

Sarah Laird is codirector of People and Plants International and has worked for many years on access and benefit sharing, ethical research and biodiversity conservation policy, including through the Convention on Biological Diversity. Her research interests include emerging technologies and conservation, traditional forest and food management systems, and the trade of non-timber forest products. In partnership with Rachel Wynberg, Sarah is directing a five-year, global process of multistakeholder dialogues and policy engagement to rethink and revise ABS, which includes an upcoming book on the topic of 'Rethinking ABS'.

Jon Paul Rodríguez holds a degree in biology from Universidad Central de Venezuela and a doctorate on ecology and evolutionary biology from Princeton University. He is Ecology Professor at the Instituto Venezolano de Investigaciones Científicas, co-founder and president of Provita, and chairs the IUCN Species Survival Commission. He defines himself as a biologist who is interested in generating information that is useful for informing conservation policies, without being a politician.

countries by 2025 and $30 billion per year by 2030. It is vital that donor countries, among others, demonstrate early progress towards these commitments.

(5) Progress must be monitored and actions adjusted as necessary to ensure success. The first official check-in will be at COP-16 in 2024, when countries will report on their national targets and plans to achieve them.

Success with the new biodiversity framework is critical to ensure progress in the 2030 Agenda, and the obverse is also true. It will be impossible to halt biodiversity loss without climate action, for example — or without progress on gender equity, reducing inequalities, and building peace and institutions, among other SDGs. The good news is that synergies among the SDGs are more pronounced than the trade-offs, so action across all goals will create a virtuous cycle that facilitates further progress. The challenge is great. But we have no other path towards living well, in harmony with nature.

Musonda Mumba: wetlands are central to addressing the intersectional nature of the SDGs

A recent visit to South Korea and China confirmed to me that resilient wetland ecosystems are central to the recovery of both plant and animal species. I visited two wetlands of international importance that are protected under the Convention on Wetlands in the Shenzhen Bay area. The Ramsar sites (Futian and Mai Po), as they are commonly referred to, are sandwiched between the cities of Shenzhen and Hong Kong. The Shenzhen Bay system is home to mangrove and tidal-mudflat wetland ecosystems. Transitioning from the cityscape into the coast area, you see a neat transition of land to sea and also of freshwater to brackish to seawater.

On the Hong Kong side is the famous Mai Po Wetland system, which is made up of ancient

fishponds known as *gei wai*. Home to many fishing communities who practiced an ancient fish-farming system in the area, these ecosystems provide food for both birds and local communities alike. Wetlands as lifelines for people and nature have been central to our collective existence and are pivotal to planetary health. Although the SDGs may have been sliced up into 17 goals, wetlands exemplify the intersectionality and cross-cutting nature of so many of them and their dependencies.

In focusing on SDG 15.1 that aims to 'Conserve and restore terrestrial and freshwater ecosystems', I want to highlight the importance of freshwater ecosystems to coastal systems in particular. Shenzhen Bay depends on freshwater infusion and nutrients from upstream into the bay area. This connectivity of land to sea (sometimes referred to as 'ridge to reef') through rivers and other waterways is critical for downstream ecosystems to thrive. The proliferation of invasive plant species within the bay area is an ongoing concern, but the Government of China, together with local partners, has been making efforts to conserve areas that are not affected and to restore those that are. Incredible strides have been made to make sure the mangrove wetland system, in particular, thrives and remains intact.

The positive change in the ecological character of these interconnected ecosystems is evident in a steady increase in the populations of the globally endangered black-faced spoonbill, whose wintering home is the Shenzhen Bay (having flown in from Songdo Ramsar site in South Korea). Earlier in 2023, the local partners WWF-Hong Kong and the Mangrove Conservation Foundation also caught on camera otters returning to the bay after not being seen for over 20 years.

Because mangrove wetlands contain vast carbon stores, their loss influences the twin planetary crises of biodiversity loss and climate change, and their protection and restoration are therefore of vital importance. The positive changes I have witnessed at sites such as those in the Shenzhen Bay area speak much to the power of collaboration, science, constant monitoring (including support from citizens), community engagement and multilateralism. This is central to the mandate of the Convention on Wetlands and why it exists, as the oldest and most experienced multilateral environmental agreement. With less than seven years to the end of Agenda 2030 and the SDGs, it is important to add that a lot of progress has been made towards positive progress and management of these fragile ecosystems. However, the COVID-19 pandemic taught us although many gains may have been lost, it is important now more than ever to consider the intersectionality and centrality of wetlands in the sustainability agenda.

Shalini Dhyani: people-centric approaches to protect and restore forests in South Asia

South Asia is blessed with rich biodiversity and is home to a large percentage of the world's native and threatened species and to high-conservation-value forest ecosystems. However, forest losses in the region have been massive, owing to agricultural intensification, urban expansion and development projects that are aimed at meeting the growing demands of a rapidly growing population. Although some countries (such as Bhutan) retain an impressive 70% forest cover, there are also cases of successful forest recovery: Nepal, for example, has enhanced its forest cover from 25% to 45% in the past two and a half decades. However, a focus on timber management from only a limited number of tree species has not translated into the recovery of biodiversity at the same rate.

A global consensus is building towards restoring degraded forests that matches up well with SDG15.1's aims of ensuring the conservation, restoration and sustainable use of ecosystems, and in particular forests. These include forest landscape restoration in the Bonn Challenge, the UN Decade on Ecosystem Restoration, nationally determined targets under the UN Framework Convention on Climate Change and the upcoming ambitious target 3 of the Kunming-Montreal Global Biodiversity Framework, which calls for effective conservation of 30% of global land and sea area by 2030. Ecosystem health assessments following the International Union for Conservation of Nature (IUCN) Red List of Ecosystems have comprised 60 national, 19 subnational and 4,279 ecosystem assessments globally — although so far only one such assessment in South Asia (in the Sundarbans mangrove forests). All of these global targets follow standards for achieving successful restoration outcomes that prioritize and endorse the revival of biodiversity at all levels.

But how can restoration ambitions be realized in a region that is changing as rapidly as South Asia? People-centric approaches supported by incentives and interactive governance are crucial. Connecting people, providing economic incentives and establishing monitoring, review and validation frameworks can help to fight deforestation. Ongoing examples include the long-term monitoring of forest cover by the Forest Survey of India, and monitoring, review and validation of increasing forest cover and biodiversity in Nepal by agencies such as NASA and ForestAction Nepal. Accepting climate uncertainty and following climate-sensitive restoration that includes Indigenous and local knowledge alongside scientific tools will be essential. Public–private economic support and citizen science-based monitoring can both support this, alongside developments in artificial intelligence to aid in decision-making.

Governmental incentives across South Asia are also providing ways to involve people in reducing deforestation. Initiatives include

those by the Government of India, such as MISHTI ('Mangrove Initiative for Shoreline Habitats & Tangible Incomes') and Ujjwala (for improved access to liquefied petroleum gas for families in poverty, which reduces deforestation for fuelwood), as well as community–government restoration, recreation and livelihood projects, such as the one in Batur UNESCO Global Geopark, Indonesia for climate resilience.

Seven years are left to achieve the SDG15.1 target by 2030. To do this, it will be crucial to have multistakeholder involvement to ensure that further forest loss is avoided and that no-go-zones are declared in high-conservation-value ecosystems. Enhanced multisectoral involvement, public–private and intergenerational partnerships to support local efforts of codesigning, cocreating, cogoverning conservation and restoration efforts will prove to be a transformative approach to accelerate this momentum.

Xiaoli Shen and Keping Ma: sustainable development as a national strategy

As president of the 15th meeting of Conference of Parties (COP15) to the Convention on Biological Diversity, China had a vital role in the adoption of the Kunming-Montreal Global Biodiversity Framework in 2021–2022. This framework highlights the goals and identifies pathways for the world to tackle biodiversity loss by 2030, which makes it an essential impetus for achieving the sustainable development agenda. Recent initiatives taken by the Chinese government coincide with these goals, such as territorial spatial planning, delineation and implementation of the ecological conservation redline, the construction of a system of protected areas with national parks as the main body and a complete ban on wildlife consumption. Currently, 30% of the land is designated as an ecological conservation redline (with varying degrees of conservation measures based on conservation values), to ensure no change in land cover and no net loss of biodiversity or degradation of ecosystem services. These efforts have led the way in helping to meet the targets of the Kunming-Montreal Global Biodiversity Framework by mainstreaming biodiversity through biodiversity-inclusive spatial planning (target 1), conserving 30% of land and sea surface (target 3) and regulating the illegal and excessive hunting of wildlife (Target 4). As such, it is hoped that these initiatives can serve as important reference cases for the international community in achieving sustainable development.

The pace of China's development, and its strategies for development, will undoubtedly affect the global SDGs. The period from 2016 to 2023, which marked the initial implementation of the 2030 Agenda for Sustainable Development, has also been a critical phase for China to achieve its own policy goals, which include poverty eradication, socioeconomic transformation and the building of an ecological civilization (a policy for sustainable development that is enshrined in the Chinese constitution to balance political, economic, cultural, social and environmental goals, and which is highly complementary to the SDGs). Global development and infrastructure initiatives put forward by China, such as the Belt and Road Initiative, the Global Development Initiative, the Global Security Initiative, and building a community of common destiny for mankind – are all aligned with the value of ecological civilization. Sustainable development has become a national strategy for China.

There remain substantial challenges to achieving the SDGs by 2030, both globally and in China. China's historic loss of biodiversity has not been fully reversed and is on the verge of worsening in the context of climate change. Moreover, China faces a daunting challenge in fulfilling the dual-carbon target of peak carbon emissions by 2030 and becoming carbon neutral by 2060. The period 2023–2030 will be a critical period for achieving the SDGs and also for the world to achieve transformative change in biodiversity conservation. In its role as the president of COP15, China needs to continue to promote the implementation of the Kunming-Montreal Global Biodiversity Framework as an important component of its participation in global environmental governance. Regionally, China should assist Belt and Road countries to better conserve their biodiversity, while seeking to promote sustainable development models that are appropriate for different countries. At the global level, by adhering to the principle of common but differentiated responsibilities, China may foster cooperation between developed and developing nations to achieve equitable and effective biodiversity conservation and environmental governance.

Rachel Wynberg and Sarah Laird: rethink access and benefit sharing to reduce inequalities and stem biodiversity loss

Access and benefit sharing (ABS) is a policy approach that links access to genetic resources and traditional knowledge to the sharing of monetary and non-monetary benefits. Its articulation in target 15.6 of the SDGs builds on several other international agreements – most notably, the 1992 Convention on Biological Diversity – that aim to address the misappropriation of these resources and to embed equity and conservation in biodiversity research, development and commercialization. Over the past 30 years, these policy efforts have coincided with escalating global concern about biodiversity loss, and changes in technology that have opened up commercial opportunities for the use of biodiversity in the pharmaceutical, biotechnology, agriculture, personal care and food industries. However, many ABS laws and policies remain overregulated, off-target and inappropriate.

When assessed against SDG indicator 15.6.1, the widespread adoption of legislative, administrative and policy frameworks for ABS in countries across the world signals substantial progress. Over time, however, the focus of ABS policy interventions has narrowed to a transactional effort to channel financial benefits: few focus on the relationships among benefit sharing, social justice, poverty alleviation and biodiversity conservation. Rather than enhance scientific collaboration and capacity building, such policy efforts have often had a restrictive effect. ABS as currently configured is thus unlikely to deliver on the SDG targets and the 2022 Kunming-Montreal Global Biodiversity Framework. A more expansive and radical rethinking of ABS is long overdue.

Questions remain about the efficacy of ABS to remedy past and current injustices between the technologically advanced Global North and biodiversity-rich Global South, and to create incentives for conservation at a time of catastrophic biodiversity loss. Agreements instead typically serve as legal compliance mechanisms that justify a 'business as usual' approach without fundamentally changing power relations or economic disparities. Moreover, whereas science and technology have transformed markedly over the lifetime of ABS (including an exponential increase in the use of genetic sequence data), ABS approaches have remained largely static — focused on negotiations, bilateral agreements and an outdated view of benefit sharing.

If the SDGs, Convention on Biological Diversity and other global goals of equitable research, biodiversity conservation and sustainable development are to be achieved, a more realistic assessment of the limited potential for ABS to fund the conservation and restoration of biodiversity is required. Instead, the focus should be on identifying ways in which funds can be leveraged from sectors that are primarily responsible for biodiversity loss, such as oil, mining, logging and industrial agriculture. Future efforts also need to link ABS to recently adopted strategies that aim to bring equity to research relationships, including between divergent economies, and to draw on open-access and networked approaches that increasingly define the practice of science.

Crucially, we need to locate ABS in the politics and realities of a world in which power imbalances and inequities in biodiversity-based trade and use continue to benefit those with capital and resources. Inclusive, deliberative and contextually embedded and centred approaches among Indigenous peoples and local communities that recognize diverse ways of knowing and being can also create new possibilities for economic power and recognition. The SDGs will most probably be achieved with systemic policy change at national and international levels that grows from the complex social, political, scientific and ecological worlds we inhabit.

Jon Paul Rodríguez: time for a 'Google map' of biodiversity

For decades, biodiversity scientists have been building the evidence base for informing policymakers. They assess the status of species and ecosystems, identify taxonomic and geographical priorities, design plans and protected areas, and implement conservation action.

Tools such as IUCN Red List of Threatened Species, Green Status of Species, Red List of Ecosystems, Species Threat Abatement and Restoration metric, World Database on Protected Areas, World Database of Key Biodiversity Areas, Green List of Protected and Conserved Areas and the Global Invasive Species Database are mobilized by the IUCN in partnership with numerous allies from within the union and beyond. Over 1,400 IUCN member organizations and over 15,000 volunteer commission members are the testing grounds and brain trust of these and other tools.

But is this knowledge being used to its full potential to guide decision-making, and in line with SDG targets such as 15.9, which aims for better integration of biodiversity values into national and local planning?

Unfortunately not: the data are currently too fragmented and not sufficiently used. But better tools are within our reach. Imagine a 'Google map' of biodiversity that integrates the knowledge mobilized by IUCN to provide open-access data to anyone interested in the species, ecosystems, degree of protection, threats and conservation opportunities in their jurisdiction, whether it is a city, state, country or continent. Such a map is technologically and logistically feasible, so why does it not yet exist? The Integrated Biodiversity Assessment Tool is a step in the right direction, but there is still a long way to go.

One possibility is low demand for scientific evidence in the identification of national priorities of the conservation and sustainable use of biodiversity. A quick look at the national biodiversity strategies and action plans produced under the Convention on Biological Diversity show that a small fraction (around 30%) include a map of the protected areas of the country. With the exception of the IUCN Red List of Threatened Species, knowledge tools are seldom mentioned in the national biodiversity strategies and action plans. This vast repository of knowledge is therefore not making it through to national-level decision-makers. Incentivizing governments to develop local versions of such tools or take advantage of available scientific evidence to guide their national priorities would clearly improve systematic reporting towards the achievement of the Kunming-Montreal Global Biodiversity Framework.

The second possibility is a lack of coordination and resource mobilization. Each one of the knowledge tools mobilized by IUCN works with little communication among them. They all support databases with varying degrees of integration and exchange with one another. Opportunities for sharing technology, staff and other resources exist, but are limited by the availability of funds. Back-of-the-envelope estimates suggest that setting up an accessible map of global biodiversity to bring together all the data mentioned above, as well as to provide a platform for others, could cost few hundreds of millions of US dollars. Maintaining such a system would probably require a few tens of millions of dollars per year. This cost is well within the reach of the donor community, working in collaboration with the partnerships that are responsible for collecting and curating these datasets.

Greater demand for these datasets from governments, plus sustained financial support by the donor community, could greatly improve our capacity to sustain and share the scientific evidence that is required to guide conservation action and monitor its success. Perhaps an 'IUCN map' of biodiversity could fill this gap.

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