Received: 29 December 2022 | Accepted: 18 January 2023

DOI: 10.1002/inc3.16

PRACTICE AND POLICY

INTEGRATIVE CONSERVATION XTBG WILEY

The Post-2020 Global Biodiversity Framework: How did we get here, and where do we go next?

Alice C. Hughes

School of Biological Sciences, University of Hong Kong, Hong Kong, China

Correspondence

Alice C. Hughes, School of Biological Sciences, University of Hong Kong, Hong Kong, China.
Email: achughes@hku.hk

Funding information

No funding received for this study.

Abstract

December 2022 finally saw the historic agreement of the Kunming-Montreal Global Biodiversity Framework (KM-GBF), a landmark framework that sets to halt and reverse global biodiversity loss by remedying the multifaceted drivers behind biodiversity declines around the planet. The KM-GBF follows on from the Aichi targets, which aimed to prevent further biodiversity loss through a concerted effort between 2010 and 2020, but which were not successfully achieved. The KM-GBF builds on the drivers of biodiversity losses rather than their outcomes and sets a suite of targeted and measurable actions to reconcile losses. Developing the framework faced considerable challenges, especially in the face of the coronavirus disease 2019 pandemic, and issues were often resolved at the very last moment. Consequently, compromises had to be made, useful elements were left out, or removed from the KM-GBF to achieve consensus, and some will need to be reflected in other ways, or incorporated into indicators. The final agreed KM-GBF includes 4 goals and 23 targets in addition to a package of annexes including a monitoring framework to set targets and benchmark progress. Particularly challenging issues included the flagship target of '30 × 30' of protecting 30% of land, freshwater, coastal, and high-sea in a representative way by 2030, which will require both new mechanisms and funding streams to enact effectively. Digital sequence information and funding mechanisms also presented major hurdles in the agreement of the KM-GBF. Ultimately, the success of the new GBF depends on implementation and mainstreaming. New targets can only be achieved through the inclusion of all sectors, clear communication, and effective funding mechanisms to guide change and provide the means to implement it. Furthermore, while common but differentiated responsibility is crucial to implementation, impacts of inaction are disproportionate in developing economies, and more resources and support are needed to enable them to develop sustainably and meet targets. This highlights the urgent need for action if we are to achieve the new targets and secure a future for all life on earth.

KEYWORDS

Aichi targets, biodiversity, conservation, conventions of the parties, policy, Post-2020 Global Biodiversity Framework

1 | PRELUDE

The Kunming-Montreal Global Biodiversity Framework (KM-GBF) marks the culmination of many years of discussion as part of the Convention on Biological Diversity (CBD), five official working-group meetings in addition to various working and contact groups, and an additional meeting on the monitoring framework. It aims to chart our way to a more secure future for life on earth; but what is

it, how did we get to this point and how do we create the conditions to reverse the continuing trends of species loss?

Practitioner points

- The Post-2020 Global Biodiversity Framework provides a critical legacy for the future of conservation.
- Understanding the process, strengths and weaknesses will be crucial to its success.
- Based on this we can navigate how to move forward to help best fulfill these targets and pave the way for future initiatives.

2 | WHY DO WE NEED A CBD?

The planet is now facing the sixth mass extinction, with an estimated one million species threatened with extinction, and rates of species loss comparable to the former five mass extinctions, thus indicating the potential loss of half the species on the planet. Since the 1970s wildlife populations around the planet have seen on average a 69% decrease, and freshwater populations have shown 83% losses on average (WWF, 2022). The colossal rate of biodiversity loss can be regarded as another symptom of the Anthropocene, where humans have become the dominant driver of patterns of life on earth and strive to put short-term profit before almost all else. Intact healthy ecosystems also provide essential services, as well as huge economic value, and the preservation of these systems is crucial for life and livelihoods (World Bank, 2022). The CBD was initially drafted in 1992 but came into force in 1993, and it has since met at 2-year intervals to attempt to reconcile global drivers of biodiversity loss through a variety of mechanisms and agreements (Hughes et al., 2022). The CBD has been ratified by 196 countries (all countries except the United States and the Holy See, which have signed, but not ratified the convention), all of which must not only agree on all outgoing targets and protocols from the CBD but is also expected to complete National Biodiversity Strategic Action Plans (NBSAPs) to monitor their biodiversity and develop mechanisms to protect and sustainably manage it.

3 | THE ROUTE TO MONTREAL

The KM-GBF is one of a series of global frameworks from the CBD and follows from a 'decade of biodiversity', where through the Aichi targets (a set of five goals broken down into 20 targets, which was launched in 2010), the global loss of biodiversity was meant to have been halted by 2020. However, while the Aichi targets partitioned drivers of biodiversity loss to reconcile the drivers of loss, reduce pressures on biodiversity and safeguard diversity at all levels as well as the services provided by healthy habitats, and to focus on routes to implementation, all the Aichi targets failed to be completed successfully. Through this 'decade of biodiversity' we have seen accelerating biodiversity loss in many parts of the world, increasing deforestation, infrastructure implementation, and levels of overexploitation of various wild species stated to pose the greatest threat to the future survival of many species (Hirsch et al., 2020).

In developing new targets understanding why the Aichi targets did not reach the intended level of success is necessary (Hirsch et al., 2020). As a consequence, the new KM-GBF includes a 'theory of change', which aims to understand the underlying drivers of diversity loss and develop targets that align with these mechanisms. The 'theory of change' was intended to address the drivers of biodiversity loss and to mainstream methods to reduce and halt the loss of biodiversity across sectors. One challenge with the Aichi targets was that many were hard, or even impossible to measure, and thus the new targets are SMART (Specific, Measurable, Ambitious, Realistic, Timebound) to ensure success can be measured and should lead to measurable conservation gains.

The CBD is scheduled to convene every 2 years; and the COP15 scheduled for Kunming was preceded by the COP14 held in Sharm-El Sheikh in 2018, where the 'Sharm El Sheikh to Kunming action agenda' was launched, to pave the way for the KM-GBF. Under the Action Agenda, organizations (countries, businesses, etc.) were able to make pledges to facilitate the reduced loss of biodiversity at all scales, and by the commencement of the KM-GBF 611 pledges and 271 partnerships, initiatives had been agreed upon (CBD, 2022h), with almost half of these (303) focused on the conservation and restoration of terrestrial ecosystems. In addition, to maintain momentum in 2020, the UNGA Biodiversity Summit took place in New York, which included a Leaders Pledge for Nature from 93 countries 'to scale up Nature-based solutions on land and sea' and to mobilize resources through the High Ambition Coalition for Nature and People (100 countries).

The High Ambition Coalition also provided the momentum for the 30 × 30 (30% of land, sea, and freshwater to be protected by 2030) as a symbol of the KM-GBF, as well as safeguarding key areas from continued habitat loss and degradation. This target was hoped to be the 'Paris target for biodiversity' (synonymous with the two-degree flagship target from the Paris agreement), something easy to communicate to nonspecialists, easy to measure, and which could genuinely enhance the global capacity to protect biodiversity. However, this target was under considerable debate, with various suggestions such as a 'zero extinction' target considered at various points, yet

metrics such as extinction are very challenging to detect for many species, and proximate indicators or models would likely be used, hence the need for a target that could be both communicated and measurable at relevant timescales (see Hughes et al., 2021). The need for something direct, measurable, and understandable and a high level of support enabled convergence on the 30 × 30 target.

The pathway from Sharm El Sheikh in 2018 to Kunming (and later Montreal) in 2021 and 2022, and the development of the KM-GBF was not an easy one. Discussions of the Zero draft of the KM-GBF were scheduled for Kunming in February 2020 and moved to Rome due to the outbreak of the coronavirus disease 2019 (Covid-19) pandemic. This discussion was to be the first of many, with the aim of drafting the most ambitious global environmental agreement ever developed (IOC, 2022).

4 | REACHING AN AGREEMENT ON THE KM-GBF

Despite many rounds of negotiations starting in 2019 (OECD, 2019), achieving a strong GBF was in question literally until the very last moment, with concern even during the December 2022 meeting in Montreal as to whether an agreement would actually be reached. By November 2022, only 20% of text and 2 of the 22 targets had been agreed upon. There were over 1800 square brackets indicating unagreed text, and consensus seemed elusive (Diaz, 2022; Hughes et al., 2022). Discussions returned to previous versions of text from the former discussions from Geneva, or Nairobi, which took place earlier in 2022. Sensitive topics were anticipated to present major barriers to agreement even before the discussions in Montreal, with topics such as digital sequence information (DSI), 30 × 30, and funding mechanisms potentially presenting barriers to agreement (Carbon Brief, 2022b; Hughes et al., 2022). These discussions became so heated that developing Nations walked out of one contact group due to a lack of agreement on resource mobilization, thus ending discussions prematurely, with only days to finalize an agreement. This disagreement was largely due to a lack of necessary funds to meet the goals of the framework and a demand for a more concrete guarantee that developing economies would have access to designated financial support. Furthermore, while these major issues were expected to be challenging, and require Ministers to resolve due to their higher seniority, debates over language, synonyms, and endless shifting of brackets often extended discussions into the early hours of the morning, putting particular strain on smaller delegations, who could not delegate various contact groups to enable them to sleep. While hour-long debates over single words may seem tedious, the legal weighting of certain phrases means that such language may be key to elements aligning with legislation and policy for some parties.

Issues including DSI and equitable benefit sharing were anticipated to face major challenges, which required considerable effort to resolve, and the option to postpone any targets on DSI to future COPs did receive serious consideration. Suggestions of removing some targets for consideration at COP16 were also made, but despite this, on the 19th of December 2022, the KM-GBF was agreed upon, with 23 targets and 4 goals, with a suite of linked annexes to detail all elements of the decisions and remove some of the potential for uncertainty.

5 | FRAMEWORK OF THE FRAMEWORK

The KM-GBF was adopted with five other decisions as a 'package', these include the monitoring framework; mechanisms for planning, monitoring, reporting, and review; capacity building and development, and technical and scientific cooperation; resource mobilization; and DSI on genetic resources, which link specifically to parts of the framework. The final KM-GBF included four goals that are supported by 23 targets, which aim to be completed by 2030. Goal A focuses on the integrity of ecosystems, the diversity of species, and halting human-driven extinction and links to eight targets. Goal B is based on the sustainable use of natural resources and the restoration of ecosystems and links to four targets. Goal C focused on DSI, ensuring the fair and equitable use of all benefits from the utilization of genetic resources (relating to Target 13). Last, Goal D focuses on implementation, mechanisms, and support (financial and through capacity building and collaboration) and links to 10 targets and 10 subtargets.

Goal A includes spatial planning to halt the loss of high diversity areas (Target 1), to protect and restore 30% of the land, freshwater, coastal and high-sea areas (T2) and to ensure they are connected, and includes representative coverage of all ecosystems (T3). In addition, Goal A covers managing threatened species to reduce the chance of extinction through appropriate management plans (T4), ensuring use is sustainable (T5), minimizing the impacts of alien species (T6), and managing ecosystems to minimize the impacts of pollution (T7) and climate change (T8).

Goal B includes ensuring sustainable management of wild species (T9), and sustainable agriculture through holistic approaches to reduce environmental impacts (T10), maximize ecosystem service provision (T11), and increase green spaces within urban environments (T12).

Goal D includes biodiversity mainstreaming across development, and private and public sectors (T14). Target 15 focuses on businesses and financial institutions, and through three subtargets, which include monitoring the impacts on the environment, facilitating sustainable consumption, and

reporting compliance. T16 also focuses on sustainable consumption through multiple mechanisms, biosafety (T17), and elimination of harmful subsidies (currently $1.8 trillion annually equivalent to 2% of global GDP) (T18). Financial dimensions are also a major component of this goal, with seven subtargets within T19 that aim to provide effective financial mechanisms and incentives for the management of biodiversity. Additionally, this goal includes strengthened capacity building and technology transfer (T20), effective communication for decision-making (T21) and gender representation (T22), and equality (T23).

These goals and targets are supported by a series of 'headline indicators' developed to measure progress to the targets and detailed in a series of annexes, all of which must satisfy six criteria to ensure they are either in use or well developed and detailed in published literature, uses accessible data, are relevant across scales and can be monitored (CBD, 2022c). These indicators were developed and elaborated in concert with the framework to enable its effective implementation (CBD, 2022a), and include a range of widely accepted data sets and methodologies including the red list of species, in addition to discussion on the red list of ecosystems and quantifiable targets around protection and population size. These headline indicators can also be further broken down into component indicators and complementary indicators (CBD, 2022b), and this series of indicators provides the basis of the monitoring framework, set to chart progress to each goal within the KM-GBF, as well as clear reporting structures to ensure appropriate data is available (CBD, 2022g).

6 | FALLING THROUGH THE GAPS

Creating and agreeing on a framework was of course challenging, and many useful elements that were in various drafts did not survive until the final text because of either disagreement between parties on aims, or perceived challenges of monitoring. Many elements, including key terms, were lost in discussions, such as the explicit mention of debt (which if not resolved may preclude reaching targets in many countries; Carbon Brief, 2022b). Milestones were also considered for some targets (providing a form of rachet and a mechanism for assessing progress) but were dismissed as making the framework too complex. However, this means measuring success may be more binary than if shorter-term targets had been agreed upon to progressively reach the 2030 targets. This is important, especially given that the Global Biodiversity Outlook 5 noted the lack of alignment between NBSAPS and the Aichi targets, and with little time to implement action, appropriate methods to assess progress are needed if we are to ensure we are on appropriate trajectories (CBD, 2020).

One such metric that was removed and linked to the monitoring framework was the Bioclimatic Ecosystem Resilience Index (Ferrier et al., 2020), which aimed to provide a way to measure the ability of ecosystems to retain species in the face of ongoing climate change, but was seen as too complex as a headline indicator by some countries. Metrics that were valuable but seen as challenging for all countries to assess were in some cases included in supportive texts and annexes, including the possibility of complementary indicators, but this means only some countries (likely those with better resources) are likely to use them. Data to be included and generated through the monitoring framework will be critical to providing better metrics to monitor success and set appropriate targets at national and regional levels (Orr et al., 2022). Work will be needed to develop the science which will underpin the monitoring framework, including collating appropriate high-resolution data for the widespread use of metrics such as the STAR metric (species threat abatement and restoration: Mair et al., 2021) to enable efficient progress toward the goals of the KM-GBF. The success of the framework will depend on a firm foundation of data, to provide baselines, develop targets and monitor progress (Gonzalez & Londoño, 2022; Leadley et al., 2022a, 2022b), thus capacity building for consistent data generation and use will be crucial. Strong support is likely to be needed to agree on consistent metrics (given the lack of core metrics required within the monitoring framework) to provide comparable data for different countries and regions and provide the baselines needed to set and monitor progress across space and time.

Furthermore, while concerns about the lack of a comprehensive glossary to prevent misrepresentation and interpretation of targets have been noted since at least the Zero draft discussion in Rome in February 2020 (notable with past challenges within REDD and perverse incentives), there is still no solid glossary, and many targets are still vulnerable to possible misinterpretation. Terms like 'Zero-net loss', 'Net-Gain' and some use of nature-based solutions evoked some concern by nongovernmental organizations (Global Forest Coalition, 2022; Hughes et al., 2022), as such approaches have facilitated biodiversity loss under past initiatives, and the need for clear oversight to ensure science-based standards are included (Cohen-Shacham et al., 2019; Pörtner et al., 2021). Elements of language and targets, especially with regard to what is to be achieved by 2030 lack precision, and thus how much can be achieved remains to be seen (Gilbert, 2022).

Other elements, such as OneHealth, came into supportive annexes and are less explicitly mentioned in the main KM-GBF (although suggested; Carbon Brief, 2022b), though the Quadripartite for One Health, the One Health High-Level Expert Panel and other relevant expert groups and initiatives will be engaged with OneHealth dimensions of the convention (CBD, 2022e). Suggestions had been made for an additional target on OneHealth,

and this could have worked as a complement to other targets, thus it will need to be a focus of future CBD-COPs to provide adequate integration with other targets and conventions and ensure One-Health approaches are also mainstreamed to reduce the probability of future zoonotic spillover.

Infrastructure also lacks explicit mention, despite its ability to act as a catalyst for destruction in areas that have managed to maintain their biodiversity, and while this may be encompassed within some elements of the targets, it fails to note the major threat to some regions presented by development. Furthermore, no note of developing best practices for conservation is noted, and a key element of restoration and development will require a basis in evidence for what is actually effective (Sutherland, 2022).

More generally, while percentage targets are somewhat arbitrary, some targets lack any set target, and simply state 'not harmful to biodiversity or ecosystem function' (i.e., Target 7), without defining how this would be determined or measured, or if any measures are in place to assess this. Other targets seem to represent so many edits that they may not be practicable, for example, Target 8 states increasing the oceans' resilience to climate change and acidification through 'mitigation and adaptation', without any note of how this might be attempted, and as Geoengineering has been removed (and excluded from), the text increasing resilience rather than preventing change may be infeasible and ineffective (ETC, 2022). While other targets have converged on very similar aims, such as Targets 2 and 3 when such targets likely could have been merged and better focused.

In addition, preventing issues rather than solving them should be a mandate of frameworks like the KM-GBF. Yet, horizon scanning on potential impacts of new technologies was removed from the draft framework, and only an element of horizon scanning as a 'one-off' process was maintained focused on synthetic biology, rather than a regular precautionary assessment (CBD, 2022i). Given the repeated issues from new chemicals from DDT onwards, broader horizon scanning approaches are clearly needed to circumvent issues occurring, but in addition to 'precautionary approaches' were removed from earlier drafts of the framework (Sutherland et al., 2020). These gaps, a general weakening of text, and explicit targets around supply chains mean that the outcomes of the framework will be determined by how countries choose to interpret and enact targets, as well as the independent actions of other sectors, which are likely crucial if targets are to be realized.

7 | CHALLENGES AHEAD?

As the final gavel fell to agree on the KM-GBF, DR-Congo (DRC) objected, not agreeing to all elements of the framework, but too late to reject the treaty; however, with coordinated work from Brazil and Indonesia (the three are part of a partnership dubbed the Opec for Biodiversity), DRC acknowledged it had been accepted, though support will be needed to act upon it (Greenfield, 2022a, 2022b). Working collaboratively to provide financially viable approaches to maintain biodiversity will be crucial if we are to see success in biodiversity hotspots around the world (Chan et al., 2022).

Elements of the treaty will also be particularly challenging to enforce, for example, the 30% target for the high-seas not only saw some opposition but also has little real mechanism for enforcement as the Areas Beyond National Jurisdiction and what is known as Biodiversity Beyond National Jurisdiction agreements, where there are no funds for monitoring, let alone enforcement (Bueno, 2021). While mechanisms for identifying key areas have been developed (Prip, 2022), how such areas could be implemented remains subject to discussion. The United Nations Convention on the Law of the Sea is the principal instrument for the implementation of conventions within the high seas, but challenges remain, especially as high-seas cover approximately 50% of the earth's surface, and further mechanisms will be needed to implement these targets.

Common, but differentiated responsibilities were a strong theme for much of the COP, especially with regard to funding mechanisms, and in some instances major drivers of biodiversity loss through embodied impacts and historic use by wealthy nations. Amongst frequent voices was that of the SIDS (Small Island Developing States), as these small states will be disproportionately impacted by climate change, extreme events, and sea-level rise, and thus require support to circumvent the worst impacts of climate change and biodiversity loss. Similarly, COP27 included discussions on accelerating climate-resilient infrastructure in SIDS, and a call for proposals to enable adaptation (PIB Delhi, 2022). Furthermore, the 40 SIDS nations have hosted 437 projects at a total value of US$2.3 billion from multilateral climate funds between 2003 and 2021, and over $150 million has been made available since 2015 for addressing climate largely through the Green Climate Fund to try to address climate-related risks (Watson et al., 2022).

8 | SUPPORT FOR SUCCESS

Success will require all components of society, and while the CBD-COP15 centered on the development of the KM-GBF, forums on science-policy, business-biodiversity and biodiversity and finance, cities and culture, and indigenous communities also convened to highlight key elements to a successful framework. The biodiversity–finance forum, including 150 financial institutions managing over $24 trillion, pushed for a more ambitious KM-GBF, as well as highlighting their principles for responsible investment to mediate the

impacts of finance and development on biodiversity (PRI, 2022; White et al., 2023), and centering biodiversity at the heart of the global economy (Bigger et al., 2021).

The KM-GBF includes the aim to mobilize biodiversity finance (Biofin) of at least US$200 billion annually by 2030, based on funding from all sources, including international, domestic, public, and private (Ainsworth et al., 2022; Brörken et al., 2022). As some elements of the new target do not fit within the existing scope of the Global Environment Facility, a new Special Trust Fund ('GBF Fund') will be established to implement the Global Biodiversity Framework. In addition to direct funds, various programs are being established, especially to realize Goal D, including an NBSAP Accelerator to enable countries to develop the baseline data needed for monitoring and targeted action (CBD, 2022d, 2022f; IUCN, 2022). Mechanisms such as debt for nature swaps, in addition to other pledges of funding for biodiversity (Finance for Biodiversity Pledge 2021). These mechanisms are crucial, as an estimated US $598–824 billion is needed to reverse biodiversity loss by 2030 (Deutz et al., 2020), and just the 30 × 30 target is estimated to require US$178 billion annually (Waldon et al., 2022), meaning that current pledges are not enough to implement the framework, and other mechanisms and resources will be needed, requiring effective mobilization of funds, increasing efficiency and reducing waste (Cumming, 2022).

Work to enhance the complementarities between the diverse array of United Nations environmental Conventions will also be needed, including various MEAs (Multilateral Environmental Agreements; CITES, UNFCCC, CMS, etc.) (Kreienkamp, 2022). Focus on complementarities provides scope for mutual gains (Smith et al., 2022; Zhu et al., 2021), as well as interlinked Sustainable Development Goals. The KM-GBF recognizes the need not to solely focus on high diversity areas (encompassed by the 30 × 30 target) but also include sustainability targets for agriculture and urban areas; as a singular focus on only intact areas would be insufficient to protect the majority of species, but communicating those elements still needs more attention (Díaz et al., 2020; Turnhout & Purvis, 2021). Developing means to translate new targets, and sustainable approaches into all components of the landscape, including agricultural systems, is crucial, yet the means of doing that still requires work. China's concept of ecological civilization provides an illustration of how these targets may be translated at a landscape level, and tools such as ecological conservation redlines (which provide a data-driven approach to landscape zoning and prioritization) (Bai et al., 2021) in addition to sustainable management provide demonstrations, which could be applied more widely (Delabre et al., 2021). These approaches must include removing habitat destruction from supply chains, which while touched upon in target 15 is not as explicit as will be needed if we are to reverse current trends. Some of these pledges have been included within the recent UNFCCC-COP27 in Sharm El Sheikh following pledges to remove deforestation from supply chains, which was rapidly implemented in Europe (Carbon Brief, 2022a; Oeschger, 2022). These include part of the 30 × 30 pledge for both the land and ocean (Campaign for Nature, 2022; US State Department, 2022). These pledges are components of the Sharm-El Sheikh adaptation agenda, which needs to reflect the interaction of unsustainable land use and climate (UNFCCC, 2022a). In addition, pledges for up to 80% of global emissions and a loss and damage fund have been established (Dickie & Jessop, 2022; UNFCCC, 2022b). Furthermore, five forest partnerships were established with the European Union (EU) as well as a 1 billion euro fund for their conservation (European Commission, 2022). The EU has also stated it will remove deforestation from supply chains, and while this is only implied within the KM-GBF, such approaches are critical if we are to see success in halting and reversing the continued loss of ecosystems for commodity production.

Ultimately, we need to remember that the initiation of the KM-GBF follows several iterations of targets, which could not be successfully completed, and there are only 7 years to meet the new targets. While these new targets are not perfect, they provide a pathway to a better future for life on earth, but everything comes down to implementation. The goal of the 2030 targets is stated within the GBF to provide a foundation for 'outcome-oriented goals for 2050', thus these goals are the first step towards what is regarded as a 'Nature positive' future. Yet, much of the framework maintains elements of the status quo, a focus on benefits from biodiversity, and further capitalization on biodiversity, which became more evident as the framework evolved through rounds of discussion. More challenging elements, negotiations on industry, agriculture, safeguards, and diet weakened through iterations of text, and yet without targeted action, we cannot begin to reduce the loss of biodiversity. The success of these targets, and achieving this vision of the future, is ultimately how far we are able to go in genuinely mainstreaming biodiversity, recognizing our inter-relationships with the environment, and creating a firm foundation for implementation including top-down and bottom-up mechanisms at all scales (Friedman et al., 2022).

The Montreal Protocol (on reducing emissions detrimental to the Ozone layer) is the only United Nations convention regarded as truly successful, as a consequence of existential risk and economic implications. While the KM-GBF narrowly avoided the Copenhagen moment of a lack of agreement and has its 'Paris moment' by reaching an agreement when many doubted it would, it can only be hoped

that like its namesake, the Kunming-Montreal Global Biodiversity Framework can successfully be achieved and that governments can genuinely appreciate that the loss of biodiversity also represents an existential risk to our collective futures.

AUTHOR CONTRIBUTIONS

Alice Hughes conceptualized, wrote, and revised the manuscript.

CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest.

DATA AVAILABILITY STATEMENT

No data were used.

ORCID

Alice C. Hughes http://orcid.org/0000-0002-4899-3158

REFERENCES

Ainsworth, D., Collins, T. & d'Amico, F. (2022) *Nations adopt four goals, 23 targets for 2030 in Landmark UN Biodiversity Agreement*. Available at: www.infra.cbd.int/sites/default/files/2022-12/221219-CBD-PressRelease-COP15-Final_0.pdf [Accessed 26th December 2022].

Bai, Y., Fang, Z. & Hughes, A.C. (2021) Ecological redlines provide a mechanism to maximize conservation gains in Mainland Southeast Asia. *One Earth*, 4(10), 1491–1504.

Bigger, P., Christiansen, J., Dempsey, J., DiSilvestro, D., Irvine-Broque, A., Nelson, S. et al. (2021) *Beyond the gap: placing biodiversity finance in the global economy. Third World Network*, 112. Available from: https://doi.org/10.13140/RG.2.2.10618.21449

Brörken, C., Hugé, J., Dahdouh-Guebas, F., Waas, T., Rochette, A.J. & de Bisthoven, L.J. (2022) Monitoring biodiversity mainstreaming in development cooperation post-2020: exploring ways forward. *Environmental Science & Policy*, 136, 114–126.

Bueno, M.P. (2021) *The role of regional cooperation in strengthening high seas governance: conceptual framework and key recommendations*. STRONG High Seas Project. Available at: https://www.prog-ocean.org/wp-content/uploads/2021/09/Bueno-M.-P.-'The-Role-of-Regional-Cooperation-in-Strengthening-High-Seas-Governance.pdf [Accessed 26th December 2022].

Campaign for Nature. (2022) *Heads of state and ministers announce new support for 30 × 30 targets, bringing 112 countries now committed to protecting at least 30% of land and ocean by 2030*. Available at: https://www.campaignfornature.org/heads-of-state-ministers-announce-new-support-for-30x30-targets-bringing-112-countries-now-committed-to-protecting-at-least-30-of-land-and-ocean-by-2030 [Accessed 26th December 2022].

Carbon Brief. (2022a) *Cropped 24 November 2022: deforestation pledges; food systems at COP27; EU fertiliser communication*. Available at: https://www.carbonbrief.org/cropped-24-november-2022-deforestation-pledges-food-systems-at-cop27-eu-fertiliser-communication/ [Accessed 26th December 2022].

Carbon Brief. (2022b) *Interactive: who wants what at the COP15 biodiversity summit*. Available at: https://www.carbonbrief.org/interactive-who-wants-what-at-the-cop15-biodiversity-summit/ [Accessed 26th December 2022].

CBD. (2020) *Global Biodiversity Outlook 5—summary for policy makers*. Montréal: CBD.

CBD. (2022a) *United Nations Biodiversity Conference COP15/CP-MOP10/NP-MOP4*. Montreal: CBD. Available from: https://www.cbd.int/conferences/2021-2022/cop-15/documents

CBD. (2022b) *Monitoring framework for the Kunming-Montreal global biodiversity framework*. Montréal: CBD. Available from: https://www.cbd.int/doc/c/179e/aecb/592f67904bf07dca7d0971da/cop-15-l-26-en.pdf

CBD. (2022c) *Proposed headline indicators of the monitoring framework for the Post-2020 Global Biodiversity Framework*. Montréal: CBD. Available from: https://www.cbd.int/doc/c/d716/da69/5e81c8e0faca1db1dd145a59/wg2020-03-03-add1-en.pdf

CBD. (2022d) *Financial mechanism*. Montréal: CBD. Available from: https://www.cbd.int/doc/c/38f2/b5c7/76f82287ccb98bc99205f115/cop-15-l-33-en.pdf

CBD. (2022e) *Biodiversity and health*. Montreal: CBD. Available from: https://www.cbd.int/doc/c/fe34/9909/1f397d23e855c04d214ba3e8/cop-15-l-17-en.pdf

CBD. (2022f) *Resource mobilization*. Montréal: CBD. Available from: https://www.cbd.int/doc/c/22fb/be2c/02e31154c4d4429de03caefe/cop-15-l-29-en.pdf

CBD. (2022g) *Mechanisms for planning, monitoring, reporting and review*. Montréal: CBD. Available from: https://www.cbd.int/doc/c/e0b8/a1e2/177ad9514f99b2cff9b251a2/cop-15-l-27-en.pdf

CBD. (2022h) *COP15: join the action agenda*. Montréal: CBD. Available from: https://www.cbd.int/portals/action-agenda/?fbclid=IwAR1tNouDmhvyU8w-ZCJFQFr09V9Eun-7BNBKOkb43hzaRIdtLzpbc5gC-SY

CBD. (2022i) *Synthetic biology draft decision submitted by the Chair of Working Group II*. Montréal: CBD. Available from: https://www.cbd.int/doc/c/0017/682f/62bf3fe472744dbc91c80282/cop-15-l-18-en.pdf

Chan, S., Bauer, S., Betsill, M.M., Biermann, F., Boran, I., Bridgewater, P. et al. (2022) The global biodiversity framework needs a robust action agenda. *Nature Ecology & Evolution*, 1–2.

Cohen-Shacham, E., Andrade, A., Dalton, J., Dudley, N., Jones, M., Kumar, C. et al. (2019) Core principles for successfully implementing and upscaling nature-based solutions. *Environmental Science & Policy*, 98, 20–29.

Cumming, T. (2022) *Closing the biodiversity funding gap: with ambitious Post-2020 Global Biodiversity Framework Targets*. Available at: https://www.biofin.org/news-and-media/biodiversity-funding-gap-global-biodiversity-framework [Accessed 26th December 2022].

Delabre, I., Rodriguez, L.O., Smallwood, J.M., Scharlemann, J.P.W., Alcamo, J., Antonarakis, A.S. et al. (2021) Actions on sustainable food production and consumption for the post-2020 global biodiversity framework. *Science Advances*, 7(12), eabc8259.

Deutz, A., Heal, G.M., Niu, R., Swanson, E., Townshend, T. & Zhu, L. et al. (2020) *Financing nature: closing the global biodiversity financing gap*. Chicago: The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability.

Díaz, S. (2022) COP15 biodiversity plan risks being alarmingly diluted. *Nature*, 612, 9. Available from: https://www.nature.com/articles/d41586-022-04154-w

Díaz, S., Zafra-Calvo, N., Purvis, A., Verburg, P.H., Obura, D., Leadley, P. et al. (2020) Set ambitious goals for biodiversity and sustainability. *Science*, 370(6515), 411–413. Available from: https://doi.org/10.1126/science.abe1530

Dickie, G. & Jessop, S. (2022) *COP27—corporate climate pledges rife with greenwashing—U.N. expert group*. Reuters. Available at: https://www.reuters.com/business/cop/un-experts-cop27-corporate-climate-pledges-rife-with-greenwashing-2022-11-08/

ETC. (2022) *CBD COP15 needs to reinforce precaution against geoengineering to protect biodiversity and communities*. Available at: https://www.etcgroup.org/content/no-climate-geoengineering-open-call-cbd-parties-and-cbd-secretariat [Accessed 26th December 2022].

European Commission. (2022) *COP27: EU launches forest partnerships with five partner countries*. Brussels: European Commission. Available from: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_6653

Ferrier, S., Harwood, T.D., Ware, C. & Hoskins, A.J. (2020) A globally applicable indicator of the capacity of terrestrial ecosystems to retain biological diversity under climate change: the bioclimatic ecosystem resilience index. *Ecological Indicators*, 117, 106554.

Friedman, K., Bridgewater, P., Agostini, V., Agardy, T., Arico, S., Biermann, F. et al. (2022) The CBD Post-2020 biodiversity framework: people's place within the rest of nature. *People and Nature*, 4(6), 1475–1484.

Gilbert, N. (2022) Nations forge historic deal to save species: what's in it and what's missing. *Nature*. https://www.nature.com/articles/d41586-022-04503-9

Global Forest Coalition. (2022) *"Net Gain" is a lose-lose for rights, gender justice and social equity in biodiversity policy*. Available at: https://globalforestcoalition.org/biodiversity-offsets/

Gonzalez, A. & Londoño, M.C. (2022) Monitor biodiversity for action. *Science*, 378, 1147.

Greenfield, P. (2022a) Drama, dismay, triumph: nailbiting climax to the world's biodiversity deal. The Guardian. Available at: https://www.theguardian.com/environment/2022/dec/22/drama-dismay-triumph-nailbiting-climax-to-the-worlds-biodiversity-deal

Greenfield, P. (2022b) *Brazil, Indonesia and DRC in talks to form 'Opec of rainforests'*. The Guardian. Available at: https://www.theguardian.com/environment/2022/nov/05/brazil-indonesia-drc-cop27-conservation-opec-rainforests-aoe

Hirsch, T., Mooney, K. & Cooper, D. (2020). *Global biodiversity outlook 5*. Secretariat of the Convention on Biological Diversity. https://www.cbd.int/gbo5

Hughes, A., Shen, X., Corlett, R., Li, L., Luo, M., Woodley, S. et al. (2022) Challenges and possible solutions to creating an achievable and effective Post-2020 global biodiversity framework. *Ecosystem Health and Sustainability*, 8(1), 2124196.

Hughes, A.C., Qiao, H. & Orr, M.C. (2021) Extinction targets are not SMART (Specific, Measurable, Ambitious, Realistic, and Time Bound). *BioScience*, 71(2), 115–118.

IOC. (2022) *2022 UN Biodiversity Conference #COP15*. Paris: Intergovernmental Oceanographic Commission. Available from: https://ioc.unesco.org/news/2022-un-biodiversity-conference-cop15

IUCN. (2022) *IUCN welcomes Post-2020 Global Biodiversity Framework as an important step towards addressing the nature crisis*. Gland: IUCN. Available from: https://www.iucn.org/iucn-statement/202212/iucn-welcomes-post-2020-global-biodiversity-framework-important-step-towards

Kreienkamp, J. (2022) *"Moment"? Global biodiversity governance. Towards a "Paris Global Governance Institute Policy Brief Series*. London: University College London.

Leadley, P., Archer, E., Bendandi, B., Cavender-Bares, J., Davalos, L., DeClerck, F. et al. (2022a) Setting ambitious international restoration objectives for terrestrial ecosystems for 2030 and beyond. *PLoS Sustainability and Transformation*, 1(12), e0000039.

Leadley, P., Gonzalez, A., Obura, D., Krug, C.B., Londoño-Murcia, M.C. & Millette, K.L. et al. (2022b) Achieving global biodiversity goals by 2050 requires urgent and integrated actions. *One Earth*, 5(6), 597–603.

Mair, L., Bennun, L.A., Brooks, T.M., Butchart, S., Bolam, F.C., Burgess, N.D. et al. (2021) A metric for spatially explicit contributions to science-based species targets. *Nature Ecology & Evolution*, 5(6), 836–844.

OECD. (2019) *OECD International Workshop. The Post-2020 Expert Workshop Biodiversity Framework: targets, indicators and measurability implications at global and national level*. Paris: OECD Headquarters.

Oeschger, A. (2022) *EU paves way for landmark deforestation-free products regulation*. Winnipeg, Ottawa: IISD. Available from: https://sdg.iisd.org/news/eu-paves-way-for-landmark-deforestation-free-products-regulation/

Orr, M.C., Hughes, A.C., Costello, M.J. & Qiao, H. (2022) Biodiversity data synthesis is critical for realizing a functional post-2020 framework. *Biological Conservation*, 274, 109735.

PIB Delhi. (2022) *Union Minister for Environment Forest and Climate Change participates in a session on "Accelerating Resilient Infrastructure in Small Island Developing States (SIDS)" at COP 27*. New Delhi: PIB. Available from: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1876724

Pörtner, H.-O., Scholes, R.J., Agard, J., Archer, E., Bai, X. & Barnes, D. et al. (2021) *IPBES-IPCC co-sponsored workshop report on biodiversity and climate change (version 2)*. Zenodo. Available at https://doi.org/10.5281/ZENODO.4782538

PRI. (2022) *150 financial institutions, managing more than $24 trillion, call on world leaders to adopt ambitious Global Biodiversity Framework at COP15*. London: PRI. Available from: https://www.unpri.org/news-and-events/150-financial-institutions-managing-more-than-24-trillion-call-on-world-leaders-to-adopt-ambitious-global-biodiversity-framework-at-cop15/10926.article

Prip, C. (2022) Identifying and describing ecologically or biologically significant marine areas (EBSAs): a key tool for the protection of ocean biodiversity in dispute. *Arctic Review on Law and Politics*, 13, 171–190.

Smith, P., Arneth, A., Barnes, D.K.A., Ichii, K., Marquet, P.A., Popp, A. et al. (2022) How do we best synergize climate mitigation actions to co-benefit biodiversity? *Global Change Biology*, 28(8), 2555–2577.

Sutherland, W. (2022) *Transforming conservation: a practical guide to evidence and decision making*. Cambridge: Open Book Publishers.

Sutherland, W.J., Brotherton, P.N.M., Ockendon, N., Pettorelli, N., Vickery, J.A. & Davies, Z.G. (2020) Making a difference in conservation: linking science and policy. In: Sutherland, W.J., Brotherton, P.N.M., Davies, Z.G., Ockendon, N., Pettorelli, N. & Vickery, J.A. (Eds.) *Conservation research, policy and practice*. Cambridge: Cambridge University Press, pp. 3–8.

Turnhout, E. & Purvis, A. (2021) Biodiversity and species extinction: categorisation, calculation, and communication. *Griffith Law Review*, 29(4), 669–685. Available from: https://doi.org/10.1080/10383441.2020.1925204

UNFCCC. (2022a) *Sharm-El-Sheikh Adaptation Agenda. The global transformations towards adaptive and resilient development*. Bonn: UNFCCC. Available from: https://climatechampions.unfccc.int/wp-content/uploads/2022/11/SeS-Adaptation-Agenda_Complete-Report-COP27_FINAL-1.pdf

UNFCCC. (2022b) *COP27 reaches breakthrough agreement on new "Loss and Damage" fund for vulnerable countries*. Bonn: UNFCCC. Available from: https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries

US Department of State. (2022) *The United States announces the first cohort of countries to endorse the ocean conservation pledge at COP27. Media Note, Office of The Spokesperson*. Washington: US Department of State. Available from: https://www.state.gov/the-united-states-announces-the-first-cohort-of-countries-to-endorse-the-ocean-conservation-pledge-at-cop27/

Waldon, A., Adams, V., Allan, J., Arnell, A., Asner, G. & Atkinson, S. et al. (2022) *Protecting 30% of the planet for nature: costs, benefits and economic implications. Working Paper*. Available from: https://www.conservation.cam.ac.uk/files/waldron_report_30_by_30_publish.pdf.

Watson, C., Schalatek, C. & Evéquoz, A. (2022) *Climate finance regional briefing: small island developing states. Climate Finance 12 Fundamentals*. Washington: Heinrich Böll Stiftung. Available from: https://climatefundsupdate.org/wp-content/uploads/2022/03/CFF12-SIDS_ENG-2021.pdf

White, T.B., Mukherjee, N., Petrovan, S.O. & Sutherland, W.J. (2023) Identifying opportunities to deliver effective and efficient outcomes from business-biodiversity action. *Environmental Science & Policy*, 140, 221–231.

World Bank. (2022) *Securing our future through biodiversity*. Available from: https://www.worldbank.org/en/news/

immersive-story/2022/12/07/securing-our-future-through-biodiversity

WWF. (2022) In: Almond, R.E.A., Grooten, M., Juffe Bignoli, D. & Petersen, T. (Eds.) *Living Planet Report 2022—building a naturepositive society*. Gland, Switzerland: WWF.

Zhu, L., Hughes, A.C., Zhao, X.Q., Zhou, L.J., Ma, K.P. & Shen, X.L. et al. (2021) Regional scalable priorities for national biodiversity and carbon conservation planning in Asia. *Science Advances*, 7(35), eabe4261.

How to cite this article: Hughes, A.C. (2023) The Post-2020 Global Biodiversity Framework: how did we get here, and where do we go next? *Integrative Conservation*, 2, 1–9. https://doi.org/10.1002/inc3.16