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Global Biodiversity Governance

Towards a “Paris Moment”?

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Global biodiversity governance: Towards a "Paris moment"?

Human-driven biodiversity loss is increasingly recognised as a potentially catastrophic global-scale risk (WEF 2021). A 2019 landmark assessment report from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) concluded that species and ecosystems are declining at rates "unprecedented in human history" (Díaz et al. 2019). Echoing this warning, the WWF's most recent *Living Planet Report* finds that global wildlife populations have declined by 69% on average between 1970 and 2018 (WWF 2022). This trend is driven by multiple, interrelated forces, from agricultural expansion, deforestation and other changes in land and sea use, to direct exploitation of natural resources, climate change, pollution, and the introduction of new invasive alien species (Díaz et al. 2019). Scientists are warning that we are entering a sixth mass extinction, with the scale and speed of species loss comparable only to five events in pre-human history, the last of which wiped out the dinosaurs (Ceballos et al. 2015).

The accelerating loss of biodiversity is not just an ecological disaster. United Nations (UN) Secretary-General António Guterres has warned that humanity is waging a "suicidal war against nature" which it cannot hope to win, as the deterioration of terrestrial, coastal, and marine ecosystems undermines human health, well-being, and prosperity (UN 2021). Poor communities in the Global South are taking the brunt of the biodiversity crisis, with more than a billion people in tropical countries highly dependent on nature for their basic needs (Fedele et al. 2021). However, the transboundary effects of the crisis are also increasingly acknowledged. Amongst other impacts, biodiversity loss threatens global water and food security (FAO 2019a), it facilitates the spread of zoonotic diseases such as COVID-19 (UNEP and ILRI 2020), it reduces the potential of future medical discoveries (Neergheen-Bhujun et al. 2017), and it jeopardises our ability to mitigate and adapt to climate change (Masson-Delmotte et al. 2020), which in turn puts additional stress on ecosystems. Ultimately, the mutually reinforcing twin risks of global warming and ecological collapse threaten the very foundations of our economic and social systems.

Despite this, biodiversity loss has only recently emerged as a high-profile global issue and its implications for humans and the global biosphere – beyond the decline of iconic landscapes and species – are still underappreciated. Unlike climate change, which is caused by greenhouse gases (GHG) that disperse into the atmosphere with no regard for national borders, biodiversity loss is less obviously a global concern (Clémençon 2021). It is also less well and widely understood. Whereas changes in global GHG emissions and concentrations can be defined, monitored and measured, there is no single metric to capture the diversity of living organisms and the resilience of the ecosystems they form part of. In fact, many of the living organisms on Earth are still unknown

to humans (Latty and Lee 2019). This is further complicated by the fact that biodiversity is not evenly distributed around the globe but rather concentrated in tropical forests and other hotspots (Myers et al. 2000), most of which are located in low-income countries (Fisher and Christopher 2007). There is a long history of resistance by Indigenous Peoples and local communities against biodiversity-depleting activities in these countries, however, such conflicts have played out over seemingly disparate issues and have not necessarily been framed in the language of environmentalism or with reference to global-level drivers (Martinez-Alier 2002).

2022 could become a crucial year for global biodiversity protection. It is hoped that a new framework for action under the UN Convention on Biological Diversity (CDB) will be agreed at the COP-15 biodiversity conference, which is scheduled to finish its work this month. Those pushing for a successful outcome have called upon COP-15 to deliver a "Paris moment for nature," with reference to the 2015 Paris Agreement on climate change, which has been widely celebrated as a major breakthrough of diplomacy (Slavin 2022). Hopes for a historic milestone agreement on biodiversity are qualified, however, by the resounding failure to implement previous global targets to protect nature. With the final negotiations on the new global biodiversity framework about to kick off, this policy brief provides a snapshot mapping of the existing governance landscape in this space. In doing so, it also highlights the complexities that have stymied more decisive political action on biodiversity conservation despite the fundamental importance of nature for virtually all aspects of our lives.

What is biodiversity and why is it important?

Biodiversity (and its loss) is notoriously difficult to define, monitor, and measure. It is often used to refer to the number of species in any given ecosystem (species richness), with extinction rates offering one of the best understood measures of its decline. However, species richness alone is an inadequate and potentially misleading indicator. It captures but one dimension of biological diversity and it cannot account for the interactions of species with each other and their environment. This is further complicated by the fact that ecological reorganisations play out at different spatial scales. For example, some local ecosystems are currently experiencing rapid species turnover, often driven by invasive species, rather than a decline in the overall number of species (Pearce 2019).

A broader, widely used definition of biodiversity is contained in the Convention on Biological Diversity (CBD):

> "Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBD 1992, Art. 2).

The CBD definition acknowledges that there are multiple dimensions to biotic variability, including (1) genetic diversity *within* individual species, (2) diversity *between* species (including the number of species in a given community and their relative abundance), and (3) diversity at ecosystem level (including differences in structure and functioning). The CBD definition also clarifies that all living organisms are part of ecological complexes, "that is, it recognises that ecological interactions are both causes and consequences of biodiversity" (Mace, Norris and Fitter 2012, p. 20). In other words, variability matters because it allows for richer interactions, which in turn make ecosystems more productive, adaptive and resilient.

Biodiversity provides the basic infrastructure for a functioning planet and human prosperity. The vast array of benefits that humans derive from healthy, biodiverse ecosystems are often referred to as "ecosystem services." This term was popularised through the Millennium Ecosystem Assessment (2005), which classified the direct and indirect contributions of biodiversity to wellbeing and quality

of life in four broad categories: (1) *provisioning* services, e.g. supply of food, water and raw materials, (2) *regulating services*, e.g. pollination of crops, water and air purification, disease control, or carbon sequestration, (3) *supporting* services, e.g. sustaining nutrient cycles, soil formation and photosynthesis, and (4) *cultural* services, e.g. provision of recreational, education, spiritual and mental health benefits.

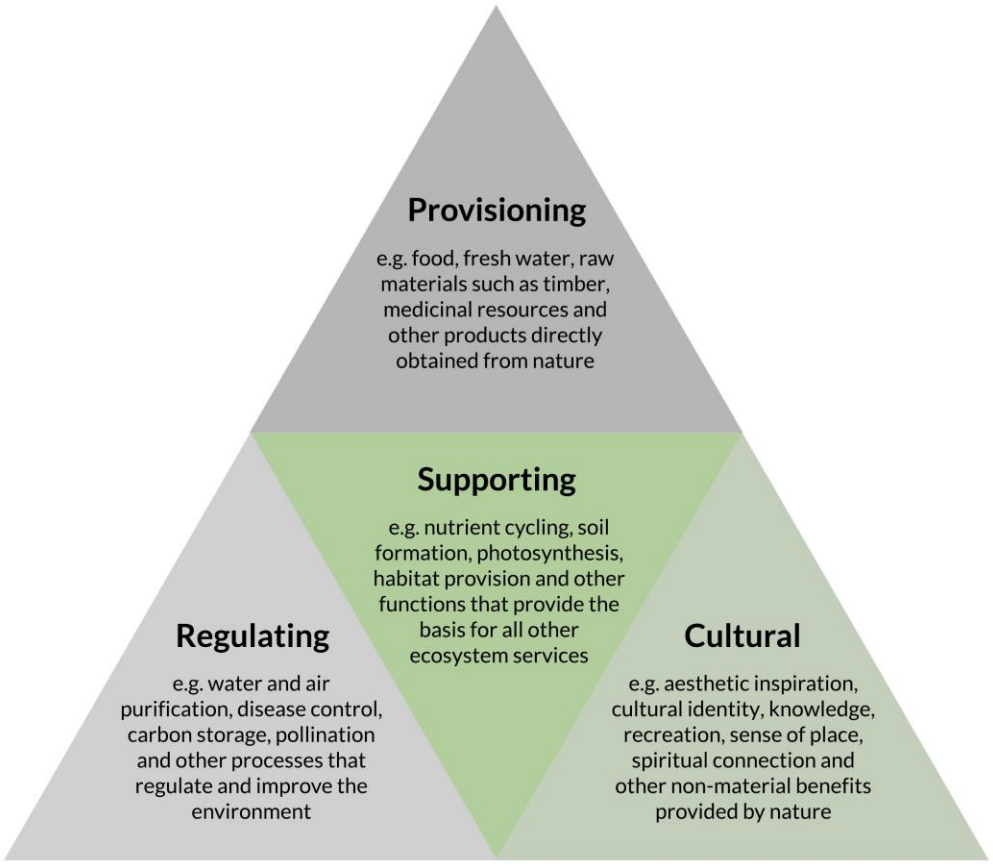

Image 1: Four categories of ecosystem services.

There is now growing recognition of the many benefits provided by biodiversity and the dangers associated with ecosystem breakdown. It is estimated that over half of the world's GDP is moderately or highly dependent on unimpaired ecosystem services (WEF 2020). This dependency is particularly high in primary sectors, such as construction, agriculture, and food and beverages. For example, the decline in pollinating species presents a large-scale risk for the food industry – and by extension global food security – with about two thirds of agricultural crop species and about 35% of total crop production relying to some extent on animal pollination (FAO 2019b).

The concept of ecosystem services usefully highlights the importance of biodiversity for our socio-economic systems. However, it has also proven polarising, with some worried that it favours narrow economic analyses and market-based approaches over traditional conservation efforts (Reyers et al. 2012). Indeed, an overemphasis on the *services* provided by nature may create problems, especially where negative trade-offs exist between the more tangible material benefits associated with provisioning and regulating services and other functions of biodiversity (Rodríguez et al. 2006). An illustrative example is the invention of modern scientific forestry in eighteenth-century Germany, which led to a conversion of old-growth forests into efficiently managed and neatly organised plantations of fast-growing tree species. This served to maximise timber provisioning services in the short run, however, in the long run, the disruption of ecosystem interactions made "optimised" forests more vulnerable to hazards such as droughts, storms and pests (Scott 1998). More recently, much attention has been focused on the regulating services that forests can provide in the context of the climate crisis, in particular with regard to carbon sequestration. Here too, negative trade-offs may

arise if carbon uptake is optimised, for example where the extensive use of non-native monoculture plantations leads to a displacement or destruction of native biodiversity and, as a result, the loss of local livelihoods (Di Sacco et al. 2021).

Such trade-offs are created or exacerbated by the fact that some ecosystem services are marketised while others are not. Much recent policy and research attention has therefore been devoted to creating more comprehensive financial accounting systems that treat all ecosystem services as capital assets (Dasgupta 2021), similar to how carbon is already being turned into something "very close to a currency" (Sheran 2022). This is based on the premise that market failures are to blame for the degradation of incorrectly priced ecosystems (Kedward 2020). Properly valuated, biodiversity losses arising from economic activities would be more likely to be avoided, minimised or fully "offset" by responsible actors, avoiding any "net loss" of nature and ideally delivering "net gains." Biodiversity offsetting schemes have already been implemented in a number of countries (Bull and Strange 2018; Droste et al. 2022). In the UK, for instance, the Environment Act 2021 requires developers to deliver a 10% biodiversity net gain for every project, whether through on-site habitat improvements, the creation of new habitats elsewhere or the purchase of biodiversity credits (UKPGA 2021).

However, efforts to quantify the value of ecosystem services are controversial, given the ethical implications of commodifying nature and the pitfalls involved in valuating highly complex socio-ecological processes (Kosoy and Corbera 2010). Critics have suggested that pricing nature correctly is practically impossible (Spash 2021) and that biodiversity offsets could inadvertently provide market participants with a "licence to trash" ecosystems while distracting from the urgent task of conserving existing biodiverse habitats (de Zylva 2018). This echoes similar concerns in the climate space, where the now-hegemonic concept of net zero is seen by some as a "dangerous trap," nurturing false hopes of cancelling out slow progress on emission cuts through offsetting and future technological breakthroughs on carbon capture and storage (Dyke, Watson and Knorr 2021). The risks associated with market-based solutions and offsetting mechanisms could be more acute still in the case of biodiversity, which is even less amenable to tech fixes and cannot easily be compressed into a single metric. Moreover, unlike greenhouse gas emissions, biodiversity is highly place-specific, meaning that habitats lost in one place cannot simply be reinstated in another. Attempting to do so may not just result in losses for biodiversity but also exacerbate social inequalities if the costs and benefits of offsetting are unequally distributed (Karlsson and Edvardsson Björnberg 2021).

As such, there are concerns that viewing biodiversity primarily through the lens of ecosystem services does not take into account the full range of social-ecological interactions, especially when it fails to engage insights from disciplines other than economics and the natural sciences as well as local and Indigenous perspectives. Responding to such concerns, IPBES has led efforts to reframe ecosystem services as "nature's contributions to people" (NCP). NCP can be understood as "all the contributions, both positive and negative, of living nature (diversity of organisms, ecosystems, and their associated ecological and evolutionary processes) to people's quality of life" (Díaz et al. 2018, p. 270). NCP strive to incorporate a plurality of disciplines, methodologies, and perspectives, including local and Indigenous knowledge systems, in an attempt to guard against overly narrow, Western-centric circumscriptions of the value provided by ecosystems. NCP also acknowledge a range of views on the relationship between nature and humans, beyond the sharp separation of "providers" and "consumers" implicit in the ecosystem services approach.

However, translating such frameworks into effective policies and governance frameworks has proven difficult. By definition, biodiversity is multi-layered and complex. The integrity, adaptive capacity and overall healthiness of ecological communities cannot be compressed into a single indicator, which makes it harder to set policy targets and monitor progress towards them. Biodiversity protection is also an inherently multi-scalar enterprise. While the focus is often on the manifestations of biodiversity loss in a particular area, many of the underlying drivers are the result of complex global- or regional-level social-ecological interactions (Liu et al. 2015; Carrasco et al. 2017).

Addressing these systemic drivers presents a formidable governance challenge, compounded by enduring disagreement over problem structure (see box below).

Enduring fault lines in environmentalism

Many of the controversies highlighted above stem from different perspectives on why, how and by whom nature ought to be protected. Numerous schools, currents of thoughts, and ideological discourses have been identified in the literature (e.g. Dryzek 1997/2022; Martinez-Alier 2002; Clapp and Dauvergne 2005; Cashore and Bernstein 2022). They are associated with different historical experiences, moral philosophies, and disciplinary cultures. Without aiming to provide a fully-fledged typology, the below sketches some of the major fault lines of debate, illustrating how disagreement on problem structure translates into diverging, and sometimes conflicting, policy demands.

- **Why does nature need protection?** All currents of environmentalism share the belief that natural environments need protection, albeit for different reasons. Economic utilitarianism is primarily concerned with the efficient long-term management of natural resources key to support economic growth and sustainable development. Here, the main focus is on market failures and/or institutional voids that encourage environmental damages and resource depletion. Justice-oriented perspectives, in contrast, highlight the role of power and vested interests. Capitalist exploitation is seen as the root of the problem, threatening nature-dependent livelihoods and the welfare of the poor and disempowered. As such, environmental protection is explicitly connected to an emancipatory project. Justice-oriented perspectives challenge narrow, growth-focused managerial approaches to achieve "the greatest good for the greatest number," however, like economic utilitarianism, their starting point is usually human welfare. In turn, eco- or biocentric approaches give priority to the environment, appealing to the intrinsic value of nature and/or the urgent need to comply with planetary boundaries. From this perspective, anthropocentric mindsets that see humans as above or outside natural systems are at the very root of the problem.

- **How can we best protect nature?** Different problem diagnoses have resulted in different policy proposals. For instance, if market failures are to blame for the decline of nature, corrective interventions might be needed to "internalise" the environmental costs of economic activities. If institutional failings drive overexploitation of shared resources such as forests, pastures, or water systems, providing local users with more power over these resources could encourage more sustainable management practices (Ostrom 2010). If the problem is not managing nature but rather constraining human encroachment on nature, we may look to states and other central authorities to set into law unnegotiable limits on environmental exploitation and, by extension, economic expansion. And if power asymmetries are at the root of the problem, effective responses might be elusive until the underlying coercive structures that facilitate the exploitation of nature and people are dismantled. Thus, controversies concern not just policy tools but also deeper directional questions, including whether the environmental crises of our age can be resolved within status-quo socio-economic systems.

- **Who is best placed to protect nature?** Disagreement also extents to the roles of different actors at different scales. For example, ecocentric policies such as wilderness preservation will often require top-down regulatory frameworks, adopted and enforced by central authorities, with input from experts in ecology and other natural system sciences. Market-based approaches rely on states or private initiatives to provide corrective frameworks but

ultimately solutions emerge from the decentralised interactions between market participants. This is primarily the domain of economists. Both command-and-control policies and marketization lead to a delocalisation of resource control. As such, they may be resisted by those arguing that community-led approaches are more effective and/or more just. The latter can draw on an eclectic set of disciplines, often rooted in the social sciences and the humanities, and non-academic sources of wisdom, such as Indigenous knowledge systems.

The global biodiversity regime complex

The global institutional architecture for governing biodiversity is highly fragmented, with an array of organisations and treaties covering different aspects relating to nature conservation and ecosystem services. There are more than 150 multilateral environmental agreements (MEAs) that address issues related to biodiversity on the global or regional level (Le Prestre and Compagnon 2016). Some of the most important biodiversity MEAs include:

- the Convention on Biological Diversity (CBD) and its protocols
- the Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES)
- the Convention on Wetlands of International Importance (Ramsar Convention)
- the World Heritage Convention (WHC)
- the Convention on Conservation of Migratory Species of Wild Animals (CMS)
- the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
- the International Plant Protection Convention (IPPC)
- the International Convention on the Regulation of Whaling (ICRW).

This governance landscape – characterised by clustered, partially overlapping legal agreements and institutions that are only loosely coupled and not organised hierarchically – is often referred to as a regime complex (Raustiala and Victor 2004; Keohane and Victor 2011). Of the MEAs listed above, the CBD is the only one that addresses biodiversity comprehensively rather than focusing on specific sectors, species or habitats. As such, it serves as an important node in the biodiversity regime complex, even though it has not emerged as a centre of gravity to the same degree as similar conventions in other issue areas, such as the United Nations Framework Convention on Climate Change (UNFCCC).

The work of the CBD cuts across a whole range of other governance domains, many of which can be understood as regime complexes in their own right (Le Prestre and Compagnon 2016). Most obviously, this includes governance arrangements concerned with other environmental challenges, such as climate change, desertification or ocean acidification. The complex biophysical interlinkages between different environmental problems have received increased attention in recent years, prompting calls for integrated “earth systems governance” (Biermann and Kim 2020). In the climate arena, engagement with biodiversity concerns has long been limited. Nevertheless, nature featured as a core theme at the two most recent global climate summits in Glasgow (COP-26) and Sharm El-Sheikh (COP-27), with the COP-27 cover decision highlighting “the urgent need to address, in a comprehensive and synergetic manner, the interlinked global crises of climate change and biodiversity loss” (UNFCCC 2022). Yet, the push for joint action has also demonstrated the difficulty of integrating policy agendas effectively and appropriately. For example, so-called nature-

based solutions, which seek to protect and manage ecosystems in a way that delivers simultaneous benefits for nature, people and the climate, have proven controversial in biodiversity circles (Gerretsen 2021). This is due to concerns that carbon sequestration will be prioritised in practice, to the detriment of nature and local communities (Gabbatiss, Tandon and Zagoruichyk 2022).

Beyond the environment, the biodiversity regime complex intersects with other related governance domains, including – but not limited to – food and agriculture, trade, development, and culture (Miller Smallwood et al. 2022):

- Biodiversity is indispensable for food production, both in terms of the plant and animal species that are directly cultivated and/or harvested and in terms of the myriad of other benefits that intact ecosystems provide for food and agriculture, from pollination to improving soil fertility, ensuring water supply or regulating pests and diseases (FAO 2019a). At the same time, modern global food systems are primary drivers of biodiversity loss (Benton et al. 2021).
- International trade directly impacts biodiversity, for instance, where it facilitates the spread of pathogens and invasive species or the trafficking of endangered species. It also contributes indirectly to biodiversity loss, including by promoting the consumption, primarily in the Global North, of biodiversity-implicated commodities, usually originating in the Global South (Lenzen et al. 2012). Moreover, the trade and biodiversity regime complexes intersect on the question of intellectual property rights for biodiversity-related innovations, with concerns over "biopiracy" a major sticking point for COP-15 discussions (Greenfield 2022a).
- Biodiversity loss affects poor communities in development countries first and hardest and these countries and communities often lack the resources to respond effectively (Roe, Seddon and Elliott 2022). Accelerating ecosystem breakdown threatens to undermine progress across the majority of the UN Sustainable Development Goals (SDGs). At the same time, dominant development discourses – rooted in economic utilitarianism – might themselves be contributing to the biodiversity crisis (Clémençon 2021).
- Governance arrangements at the interface of biodiversity and culture recognise that "[b]iodiversity and cultural diversity are intricately linked" (UNESCO n.d.). Biodiversity serves a source of cultural identity, spiritual wellbeing, inspiration and sense of place. In turn, cultural diversity can be seen as important to sustain a wide array of conservation practices that rely on the intergenerational transmission of local or Indigenous knowledge and institutions (Maffi and Woodley 2010).

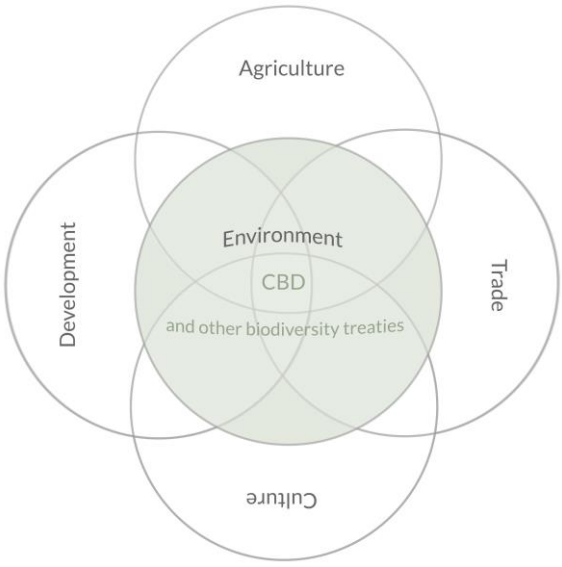

Image 2: Global Biodiversity Governance Complex (simplified, based on Miller Smallwood et al. 2022, p. 48)

Institutional plurality and fragmentation are not unique to biodiversity governance nor are they necessarily detrimental to global policy outcomes (Orsini, Morin and Young 2013; Archarya 2016). However, they arguably present particular challenges to biodiversity governance, where policy coherence is a long-standing concern (Velázquez Gomar, Stringer and Paavola 2014; Velázquez Gomar 2016; Rogalla von Bieberstein et al. 2019). On the global level, a lack of coordination within the biodiversity regime complex may result in a duplication of tasks as well as the emergence of inconsistent or even conflicting norms and rules. On the national level, it threatens to undermine effective implementation as authorities struggle to simultaneously engage and comply with a patchwork of international regulations (UNEP-WCMC 2012).

Integrating global biodiversity targets negotiated under the CBD across all relevant conventions has proven challenging in the past (Velázquez Gomar, Stringer and Paavola 2014). The UN Environment Programme (UNEP) has also struggled to provide consistent leadership when it comes to coordinating the work of different MEAs (Andresen 2007). Nevertheless, increased efforts have been made over the past decade to explore synergies and provide a level of integration between the different biodiversity-relevant conventions, for example through the Biodiversity Liaison Group (CBD 2020a). Going forward, efforts to bridge policy siloes must also be strengthened on the regional and national level, where synergetic coordination is, in some cases, even weaker than on the global level (Velázquez Gomar, Stringer and Paavola 2014).

An important recent development in global biodiversity governance has been the establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in 2012 (see box below). Unlike the climate change regime, which historically emerged out of institutionalised scientific exchange on the global level, the biodiversity regime initially lacked grounding in robust scientific assessments, produced by a prominent science-policy interface body. By providing knowledge on biodiversity and nature's contributions to human wellbeing and sustainable development, with a view to identifying priorities and policy-relevant tools, IPBES could potentially play a broader integrative function within the global biodiversity regime complex. Indeed, as Hrabanski and Pesche (2016) argue, the creation of IPBES was partly prompted by “the necessity for coordination and coherence” in an increasingly messy governance reality.

While states remain the primary actors in global environmental governance, the wider biodiversity regime complex is not limited to intergovernmental institutions. Transnational initiatives are also an increasingly important feature of global biodiversity governance, creating novel spaces for non- and sub-state actors, such as cities, regions, businesses, investors, and civil society organizations, to collaborate and take voluntary action (Pattberg, Widerberg and Kok 2019; Negacz et al. 2020). This hybridisation of the biodiversity governance regime mirrors developments in other governance domains, notably climate change, and is now actively being encouraged by the CBD, for instance through the creation of novel channels for consultation with sub-national governments (Scottish Government 2021) or the establishment of a voluntary commitment platform aimed at catalysing non-state initiatives (CBD Action Agenda n.d.). Many of these initiatives come in the form of networks or multistakeholder partnerships and they often address biodiversity conjointly with other sustainability challenges, for example through voluntary standard setting and certification regimes for forestry, agriculture, or fishery. Initiatives such as the Forest Stewardship Council have emerged as influential players shaping sustainability governance. However, their effectiveness is contested when it comes to addressing the underlying drivers of unsustainable economic practices and enabling pluralistic discourse (Moog, Spicer and Böhm 2015).

Beyond engagement of transnationally organised non-state actors, there is growing commitment to consider on-the-ground perspectives on biodiversity. Indigenous Peoples and local communities play a particularly important role in this regard. While Indigenous Peoples represent less than 5% of the global population, they manage or have tenure rights over about 25% of the world’s land area, including many of its most biodiverse ecosystems (Garnett et al. 2018). Nature is generally declining less rapidly in areas under Indigenous stewardship (Díaz et al. 2019), highlighting the need of grounding transformative biodiversity governance in the rights, knowledge, and agency of

these communities (Reyes-García et al. 2022). However, governance processes have often been inadequately responsive to the needs and perspectives of marginalized communities, including Indigenous Peoples (Visseren-Hamakers et al. 2021). Terms such as “IPLCs” (Indigenous peoples and local communities) and “ILK” (Indigenous and local knowledge) are now firmly established in the vocabulary of international institutions, such as the CBD, yet, Indigenous communities do not always feel that such recognition has translated into genuine engagement (Guillot 2021). Some have also raised concerns over the widespread use of umbrella acronyms that risk conflating Indigenous rights and the interests of “local” communities, which are not necessarily compatible (Brondízio et al. 2021). It is also important to note that Indigenous interests might clash with mainstream conservation policies, such as the establishment of protected areas, if these policies threaten Indigenous land rights (Guillot 2021). This will be another important concern at COP-15, which is expected to deliver a commitment to protect 30% of the planet's land and oceans by 2030 as a central pillar of the new biodiversity framework.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) was established in 2012 as an independent intergovernmental body tasked to advance the science-policy interface for biodiversity and ecosystem services. Although not a UN body, its secretariat is administered by UNEP, and it has established collaborative partnerships with several UN programmes and specialised agencies as well as biodiversity-relevant MEAs. As of December 2021, IPBES has 137 member states.

Although its creation was inspired by the success of the well-known Intergovernmental Panel on Climate Change (IPCC), IPBES is not simply a biodiversity-focused copy of the IPCC. Whereas the work of the IPCC encompasses primarily the production of regular assessment reports, IPBES has a much broader remit (Brooks, Lamoreux and Soberón 2014). In addition to undertaking assessments, it is explicitly mandated to provide policy support, engage in capacity building, and catalyse efforts to generate new knowledge. To support this mission, IPBES has developed a conceptual framework, which highlights, inter alia, the importance of transparency, inclusiveness, and participation as well as the need to involve different scientific disciplines, stakeholders, and knowledge systems, including local and indigenous knowledge (Díaz et al. 2015).

Since its inception, IPBES has become an increasingly important voice in the biodiversity space. To date, it has completed eight assessments on various themes, including the most comprehensive global assessment of biodiversity and ecosystem services ever completed (Díaz et al. 2019). However, its efforts to work across scales as well as disciplines and epistemological frameworks have proven challenging (Löfmarck and Lidskog 2017; Soberón and Peterson 2015; Masood 2018). While the inclusion of local and Indigenous knowledge systems has been welcomed by many, it has also been cautioned that “the rigidity, formality and institutional requirements of IPBES processes” threatens to marginalise non-Western and non-scientific knowledge holders (Dunkley et al. 2018, p. 780). In addition, as a boundary organisation operating at the interface of science and policy, IPBES inevitably encounters the challenge of having to offer practical policy tools without being seen as policy-prescriptive or politicised. Finally, IPBES is suffering from a weak financial base that is incommensurate with its ambitious mandate (Rankovic and Laurans 2017).

Many of these issues were highlighted in a 2019 external review of IPBES, which acknowledged that the panel faces several challenges, tensions and trade-offs in attempting

to produce and share knowledge that is widely perceived as credible, legitimate and policy-relevant while also reflecting a diversity of perspectives (Stevance et al. 2020). That said, IPBES represents the most ambitious attempt to integrate local and Indigenous knowledge into global level science-policy mechanisms. There is increasing recognition that we cannot address complex environmental problems without the inclusion of diverse stakeholders and local perspectives. As such, the work of IPBES can offers vital lessons for global governance in other areas, such as climate change.

The Convention on Biological Diversity (CBD)

The CBD was adopted at the 1992 Earth Summit in Rio de Janeiro, along with its sister conventions on climate change and desertification. It enjoys almost universal membership, with the notable exception of the United States, which has signed but never ratified the Convention. The CBD Secretariat, located in Montreal, Canada, is administered by UNEP. Its supreme decision-making body, the Conference of the Parties (COP) includes all states that have ratified the Convention, and meets biannually to review progress, discuss priorities, and negotiate subsidiary instruments and decisions.

The CBD has a broad mandate, with three overarching objectives focused on (1) "the conservation of biological diversity," (2) "the sustainable use of its components," and (3) "and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources" (CBD 1992, Art. 1). While the Convention recognises biodiversity conservation as "a common concern of mankind" (ibid, Pmbl.), it is deeply rooted in the principle of sovereignty (Willmore 2017), with Article 3 affirming the sovereign right of state parties to exploit their natural resources in accordance with their own environmental policies, as long as these activities do not cause transboundary harm.

The broad remit of the Convention and its emphasis on national sovereignty can be understood as a product of its particular negotiation dynamics. Whereas most developed countries wanted a treaty focused solely on conservation, developing countries were deeply concerned about issues relating to their economic development, funding, technology transfer and the prevention of biopiracy, i.e. the appropriation of genetic resources and/or Indigenous knowledge without fair compensation. Given that developing countries host the vast majority of biodiverse natural resources, they found themselves in an unusually strong bargaining position and were able to broaden the remit of the CBD to also include issues related to trade and intellectual property rights (McGraw 2002). The breadth of its mandate makes the CBD unique; but it has also given rise to concerns that the Convention "could collapse under its own weight" or suffer from a loss of issue salience (ibid, p. 23). Indeed, compared with other environmental treaties, such as the UNFCCC, the CBD has seen little media coverage, public awareness and high-level political engagement, even in the run-up to the crucial COP-15 negotiations (Maljean-Dubois 2022).

The CBD is a framework convention and, as such, it includes few "hard law" provisions. The principal instruments for CBD implementation are National Biodiversity Strategies and Action Plans (NBSAP), which all state parties are required to prepare and submit. States parties must also ensure, "as far as possible and as appropriate," that these strategies are mainstreamed across planning and policy-making in all relevant areas (CBD 1992, Art. 6b). There are good reasons for emphasising national-level planning and implementation, given that biodiversity governance must ultimately be rooted in local context. However, the absence of systematic global-level review and accountability mechanisms under the CBD has hampered progress on nature-related targets and is indicative of the fact that biodiversity, unlike climate change, has traditionally not been considered a fundamentally transboundary problem (Ulloa, Jax and Karlsson-Vinkhuyzen 2018).

The COP has finalised two major additional legal instruments under the Convention: (1) the 2000 Cartagena Protocol on Biosafety, which regulates the transboundary movement of living modified organisms (LMOs), such as genetically engineered crops, that may have adverse effects on biodiversity, and (2) the 2010 Nagoya Protocol on Access and Benefit-sharing, which aims to prevent biopiracy. However, while these treaties cover important international issues, they only scrape at the surface when it comes to the drivers of biodiversity decline. As Miller Smallwood et al. (2022, p. 44) observe, "it is remarkable that no protocol has been agreed relating to the first objective of the CBD, biodiversity conservation."

Rather than negotiating any legally binding protocols on conservation, the CBD has taken a decisively "soft" approach to its first objective, focused primarily on the development of strategic plans and non-binding global targets (Harrop and Pritchard 2011). The first such target, set by the COP in 2002, aimed "to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth" (CBD 2010). This target was subsequently endorsed by the World Summit on Sustainable Development as well as the UN General Assembly and incorporated into the Millennium Development Goals. Although a range of indicators to measure progress were added in 2004, the 2010 target was vague and ambiguous, effectively adding very little to existing commitments under the CBD. It also failed to frame ambition in a way to catalyse positive action, beyond calling upon state parties "to simply stop doing quite so badly" (Mace et al. 2010, p. 4). By the end of the decade, it was clear that the target had not been met, with biodiversity decline around the world not just continuing but, in many cases, accelerating (CBD 2010).

In 2010, at the COP-10 meeting in Japan, state parties agreed on a new set of 5 strategic goals and 20 targets as part of the CBD's Strategic Plan for Biodiversity 2011–2020. The so-called Aichi targets, named after the Japanese prefecture where they were adopted, were meant to turn the tide on the decline of nature by 2020, during what was declared the United Nations Decade on Biodiversity. In response to the failure of the first global target, the Aichi targets were designed to be "SMART" – sufficiently specific and measurable, ambitious yet realistic, and time-bound (i.e. setting clear deadlines) (Maxwell et al. 2015). Beyond protecting biodiversity and enhancing ecosystem resilience, they were explicitly intended to contribute to human well-being and poverty eradication, highlighting clear linkages with other global frameworks, above all the SDGs. Like their predecessor, the 2010 biodiversity goal, the Aichi targets were not legally binding, rather parties were expected to translate them into voluntary national targets and actions and incorporate these into their NBSAPs.

Progress towards the targets has been measured primarily through national-level reports and the CBD's four-yearly *Global Biodiversity Outlook*, which is partly informed by IPBES assessments. On the global level, the world has clearly failed to deliver, with none of the 20 Aichi targets fully achieved and only six targets met partially (CBD 2020b). National-level reports paint a slightly more positive picture, however, this is qualified by the fact that state parties had a lot of flexibility when interpreting the Aichi targets in their national context (ibid). Several weaknesses of the Aichi approach have been identified in the literature, including the ambiguity and excessive complexity of targets, their voluntary nature, the lack of appropriate accountability mechanisms, and a shortage of funding and support for implementation (Butchart, Di Marco, and Watson 2016; Xu et al. 2021).

Above all, the Aichi framework failed to address the deeper underlying drivers of biodiversity loss. This is partly due to the fact that national-level implementation has been largely confined to environmental ministries, without wider integration of biodiversity concerns into strategies, policies and planning processes (CBD 2020b). This meant that state parties were able to make more (if still insufficient) progress on clearly circumscribed tasks which are under the purview of environmental agencies, such as creating new protected areas. However, they overwhelmingly failed to tackle **"**the really important stuff—reducing the overwhelming pressure from overfishing, deforestation, transportation, energy production, and agriculture— [which] is usually under the control of other,

more powerful agencies" that are largely disconnected from the CBD process (Obura qtd. in Zimmer 2020).

Assessment of progress towards the Aichi targets (CBD 2020b)

Strategic Goal A: Mainstreaming	Target 1: Raising awareness of the values of biodiversity	Not achieved
	Target 2: Integrating biodiversity values in planning, reporting and national accounting	Not achieved
	Target 3: Eliminating harmful incentives and developing positive incentives	Not achieved
	Target 4: Promoting sustainable production and consumption	Not achieved
Strategic Goal B: Direct Pressures and Sustainable Use	Target 5: At least halving the rate of habitat loss and significantly reducing degradation and fragmentation	Not achieved
	Target 6: Managing and harvesting fish and other aquatic living resources sustainably	Not achieved
	Target 7: Managing areas under agriculture, aquaculture and forestry sustainably	Not achieved
	Target 8: Reducing pollution	Not achieved
	Target 9: Identifying, prioritising and controlling invasive alien species	Partially achieved
	Target 10: Minimising anthropogenic pressures on coral reefs and other vulnerable ecosystems	Not achieved
Strategic Goal C: Status of biodiversity	Target 11: Turning at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas into protected areas	Partially achieved
	Target 12: Preventing the extinction of threatened species	Not achieved
	Target 13: Safeguarding genetic diversity	Not achieved
Strategic Goal D: Benefits to all	Target 14: Restoring and protecting ecosystems that provide essential services	Not achieved
	Target 15: Enhancing ecosystem resilience and the contribution of biodiversity to carbon stocks	Not achieved
	Target 16: Implementing the Nagoya Protocol	Partially achieved

Strategic Goal E: Enhance implementation	Target 17: Effective, participatory and updated national biodiversity strategy and action plans	Partially achieved
	Target 18: Respecting and engaging the traditional knowledge and practices of Indigenous and local communities with their full participation	Not achieved
	Target 19: Improving, sharing and applying knowledge, science base and technologies relating to biodiversity	Partially achieved
	Target 20: Mobilising financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources	Partially achieved

Towards a post-2020 Global Biodiversity Framework

CBD state parties are currently in the process of negotiating the post-2020 Global Biodiversity Framework (GBF) to guide action over the next decade and pave the way towards the CBD's long-term vision of "living in harmony with nature" by 2050. COP-15 negotiations of the GBF, organised under the presidency of China, were originally scheduled to be concluded in October 2020, during what was meant to be a "super year" for nature (UNEP 2019). However, in the wake of the COVID-19 pandemic, COP-15 was postponed several times before eventually proceeding in two stages. The first part of the conference took place almost entirely virtually from 11-15 October 2021. The second part of the conference, which is expected to adopt the final GBF, will be held in Montreal, Canada, from 7 to 19 December.

It is widely hoped that the post-2020 GBF could become a "Paris Agreement for nature," galvanising renewed action, attention, and resources towards biodiversity protection. However, so far, the COP-15 process has failed to produce significant political momentum. While other global conferences, including the 2021 climate summit (COP-26) in Glasgow, went ahead despite continued COVID-19 disruptions, COP-15 was delayed four times and its now scheduled to conclude around the time of the World Cup final. The decision reached at the most recent climate talks in Sharm el-Sheikh mentioned nature but did not explicitly reference COP-15 (Dickie 2022). Perhaps most illustrative of the failure to instil the necessary political urgency is the fact that only few world leaders are expected to attend the talks in Montreal (Farand 2022).

The draft text of the post-2020 GBF has been in the making since 2019, however, following the latest meeting of the framework's dedicated working group in June, it was still littered with brackets, indicating that many specifics remain unresolved (CBD 2022). As it stands, the draft framework's overall structure – comprising four long-term goals and 22 decadal targets – looks quite similar to the Aichi targets, although efforts have been made to include more quantifiable indicators for target achievement (Hughes et al. 2022). Targets cover a range of key challenges, such as scaling up protected areas, slowing extinction rates, cutting pesticides, pollution and waste, controlling invasive species, promoting the sustainable use of natural resources, improving private sector accountability and implementing nature-based solutions to help mitigate and adapt to global warming. In keeping with the CBD's soft approach to biodiversity conservation, targets will not be binding on state parties and the success of the GBF will depend on effective delivery on the domestic level.

A multi-target approach to biodiversity protection, as embodied by the Aichi goals and the draft GBF, is not uniformly supported. There are concerns that the lack of a clear and measurable headline target, similar to the 1.5-2°C temperature target enshrined in the Paris Agreement, makes it more difficult to communicate and effectively promote these frameworks. Yet, defining an overarching

global target to reverse biodiversity loss has proven difficult. For example, while some have suggested to focus on species extinction rates (Rounsevell et al. 2020), others have advocated for aggregate measures, aimed at making the world "net nature-positive" by 2030 (Locke et al. 2020). In practice, much recent attention has focused on an area-based target, namely the so-called 30x30 commitment to turn a minimum of 30% of the world's oceans and land into protected areas by 2030. Championed by the High Ambition Coalition for Nature and People (2022), 30x30 has already been officially embraced by more than 100 countries and is including in the draft GBF as target 3.

While it is hoped that the 30x30 target could provide useful rallying point for policy change, overemphasising one single metric could be detrimental to addressing a multi-faceted challenge such as biodiversity loss (Turnhout and Pervis 2021; Díaz et al. 2020). Area-based conservation measures can play an important part in biodiversity protection but they do not present a silver bullet solution. At worst, they risk distracting from tackling the deeper systemic drivers that are at the root of biodiversity loss. Put simply, "conserving 30% of the planet is not going to matter if we destroy the other 70%" (UNESCO representative qtd. in Tsioumanis 2021). There are also concerns that the 30x30 commitment could lead to massive land grabs if it fails to recognise the tenure rights of Indigenous peoples and other communities currently living in highly biodiverse areas (Survival International 2022).

The post-2020 GBF aims to promote "transformative" change – a commitment that was reiterated in the Kunming Declaration, adopted last year during the first instalment of COP-15 (CBD 2021b). Ambitious measurable targets are an important precondition for transformation and state parties' efforts to backtrack in this regard are worrying (Díaz 2022). But beyond ambitious targets, transformative change will also require a reform of governance (Kok et al. 2022). The GBF is grounded in a "theory of change" that emphasises the need for an integrated multi-scalar strategy supported by robust financing, implementation and monitoring mechanisms that allow global targets to be transposed into domestic policies and laws, in a manner that enables mainstreaming and information-sharing across all of government and participation from all levels of society (CBD 2022). Yet, the draft framework provides little detail on how exactly these aspirations are to be achieved (Bulkeley, Kok and van Dijk 2021). This is problematic, given that truly transformative change is unlikely to be a consensual process. Addressing the indirect drivers of biodiversity loss – from harmful subsidies to wasteful consumption and production modes and unsustainable food systems – challenges vested interests and status quo arrangements and will therefore require strong governance frameworks and significant political will.

An important enabling condition for effective implementation of the GBF – and a key sticking point in the COP-15 negotiations – is finance. Current annual spending on biodiversity protection, estimated at US$ 124-143 billion, is dwarfed by public expenditure on environmentally harmful subsidies from agriculture, forestry and fisheries, estimated at US$ 274– 542 billion, demonstrating the urgent need to fundamentally realign financial incentive structures (Deutz et al. 2020). Developing countries which host the majority of the world's most biodiverse ecosystems will need targeted financial support for nature protection. The past year has seen some important developments in this regard, including the launch of China's Kunming Biodiversity Fund (Farand 2021), new pledges to the Global Environment Facility, totalling US$ 5.25 billion (GEF 2022), and the unveiling of new finance initiatives at a UN high-level event in September (Gilbert 2022). New commitments by states have been bolstered by pledges from philanthropic organizations (Kapoor 2021) and financial institutions (Finance for Biodiversity Pledge 2021).

While these are promising developments, current available finance is far from sufficient. According to recent estimates, between US$ 598-824 billion would be needed in additional investment to reverse the decline in biodiversity by 2030 (Deutz et al. 2020). Implementing the 30x30 target alone could require investments of up to US$178 billion per year, mostly in developing countries (Waldon et al. 2022). The current draft GBF includes a bracketed provision for developed countries to mobilise

at least US$100 billion of biodiversity finance a year until 2030 (CBD 2022). However, the failure of rich countries to live up to similar promises on climate finance has already undermined much trust in such commitments and contributed to growing tensions between the Global South and the Global North (Treyer 2022).

Beyond finance, North-South divisions have also come to the fore in discussions on biopiracy and, more specifically, the question of fair benefit sharing from digital sequence information (DSI). Digitally stored genetic data from plants, animals and other organisms is an important source of innovation in medicine, agriculture and many other fields. While the CBD has already established rules on access and benefit sharing from the use of genetic resources under the Nagoya Protocol, DSI is currently a grey area (Hartman Scholz et al. 2022), creating potential loopholes for companies to use genetic information for new discoveries, without adequately compensating the countries whose biodiversity delivered the data. The question how profits from DSI should be shared has emerged as a major source of friction during recent talks and some African countries have indicated that they will not be able to support the GBF without agreement on DSI (Greenfield 2022a).

The slow pace of negotiations on the GBF, the lack of political leadership, and insufficient ambition have led to concerns that COP-15 could produce a “Copenhagen” rather than a “Paris” moment. This is in reference to the 2009 Copenhagen climate conference, which failed to deliver a new global agreement, as had been expected, and ended in chaos and disarray. Perhaps more likely than a complete breakdown of the talks is a low ambition scenario. As CBD Executive Secretary Elizabeth Maruma Mrema warned earlier this year, “[i]f negotiations continue this way, we will probably end up with a framework but it probably won’t be ambitious, innovative or what is expected to really change the loss of biodiversity” (Greenfield 2022b).

COVID-19: Boost or setback for global biodiversity protection?

The COVID-19 pandemic has had mixed implications for the protection of biodiversity. While the slowdown of human activity provided temporary relief to many species and ecosystems, especially during the early lockdowns of 2020, it did little to reduce the underlying pressures on biodiversity (Gibbons et al. 2021).

For example, deforestation of the Amazon rain forest continued at unprecedented scale throughout 2020, with devastating consequences for its unique ecosystems and the global climate. While air pollution saw marked drops during early lockdowns, plastic pollution increased dramatically due to the widespread use of personal protective gear, changing consumer behaviour and disruptions to recycling and waste management systems (Ford 2020). COVID-19 forced many countries to scale down the monitoring of environmental and wildlife crime, encouraging poaching and illegal resource extraction (Brown 2020). Similarly, the disruption of pest control measures during lockdowns allowed some invasive species to thrive, putting native wildlife as well as public health at risk.

Lockdowns and travel restrictions also impeded lab-based and on-site research activities during the pandemic, resulting in lost opportunities to systematically study the impact of the “anthropause” on species and ecosystems (Gibbons et al. 2021). Even more alarmingly, the disruptions caused by COVID-19 have put environment and land defenders at increased risk. According to data collected by Global Witness (2021), 227 people were killed in 2020 while trying to protect their land and local ecosystems, making it the deadliest year for environmental defenders ever recorded.

In the long run, the economic fallout from the pandemic and subsequent disruptions, such as the war in Ukraine, could have even more devastating consequences for biodiversity. As national budgets and priorities are adjusted to boost recovery efforts, there is a risk that countries could weaken environmental legislation and reduce public funding for biodiversity protection. The collapse of other sources of funding has already put many conservation projects at risk, in particular in Africa, where wildlife tourism is a major source of income (Paxton 2020). Long-term economic stagnation also threatens poverty reduction efforts in low-income countries, possibly forcing communities to rely increasingly on the exploitation of natural resources for survival (Gardner 2020).

Yet, there is also hope that the COVID-19 experience could galvanise governments to take more ambitious action to protect biodiversity. Greater concern over the zoonotic risk from wildlife exploitation has already resulted in some concrete policy changes, including new regulations aimed at curbing wildlife trade and consumption in countries such as China and Vietnam (Humphrey 2020). Elsewhere, holistic biodiversity protection has been recognised as a core ingredient to a successful 'green recovery' from COVID-19. There is also indication that public awareness of nature-related topics has increased, as many have found solace in local natural environments during the crisis (Rousseau and Deschacht 2020).

Tackling the underlying drivers of biodiversity loss

Decisive policy action over the next decade will be critical if we are to meet global goals on halting biodiversity loss and related sustainability challenges. So far, responses on all levels of governance have been woefully inadequate, resulting in wide-ranging and increasingly rapid changes to ecosystem structures and functioning, many of which cannot be reversed. While there has been partial progress across a few relatively delimited areas of nature protection, previous global frameworks have largely failed to address the root causes of its decline. As the 2019 IPBES assessment report makes clear, curbing biodiversity loss effectively will require tackling the five main direct drivers of biodiversity loss – namely changes in land and sea use, overexploitation of organisms, climate change, pollution, and the spread of invasive alien species – all of which are ultimately rooted in unsustainable socio-economic values, institutions and behaviours (Díaz et al. 2019).

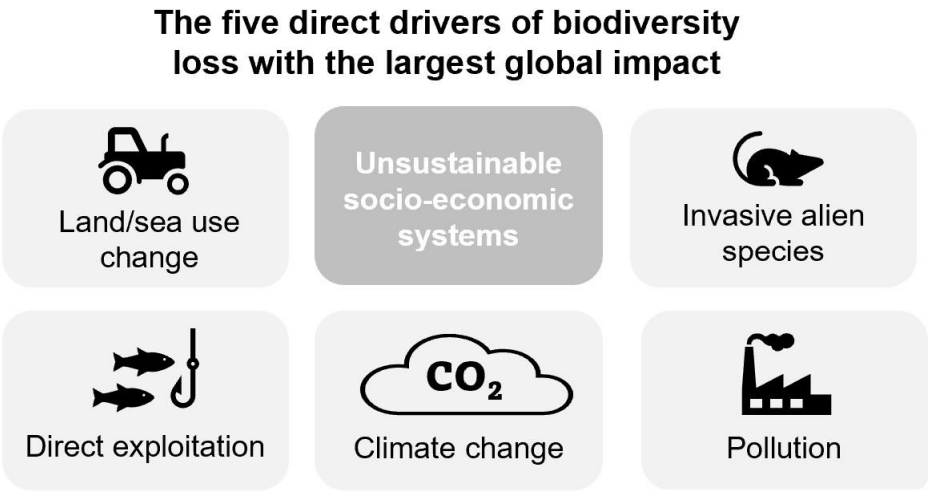

Image 3: Main direct drivers of biodiversity loss (Díaz et al. 2019).

The emerging post-2020 Global Biodiversity Framework (GBF) acknowledges that nothing short of "transformative" change will be sufficient to reverse current trends of nature decline (CBD 2022). Yet, unless the GBF is underpinned by effective review and implementation mechanisms, financial commitments and the political will to address root causes, it will scrape only at the surface of the problem. The broader disconnect between action (and money) directed towards protecting nature and the practices that accelerate the decline of nature cannot be resolved under the remit of the CBD and national environmental ministries alone. However, despite being a long-standing aspiration of the CBD regime, the integration of National Biodiversity Strategies and Action Plans (NBSAPs) across all relevant sectors continues to pose a key challenge. As a result, "biodiversity remains a siloed issue internationally and in most national contexts" (Rankovic, Jouve and Landry 2021, p. 2).

One area in which biodiversity loss has received increasing attention recently is the debate on climate change. This is positive news, given that the two challenges are closely interrelated and mutually reinforcing. Since media coverage of climate change is disproportionately higher than reporting on biodiversity loss (Legagneux et al. 2019), greater integration of the two issue areas also promises to enhance public awareness of the consequences of nature decline. That said, it also creates new challenges, including the risk that conservation is framed exclusively as a climate change mitigation and adaptation strategy. Attempts to extend prominent climate-related concepts and governance frameworks to the biodiversity space – such as a focus on "net" improvements or calls for an apex target similar to the 1.5°C Paris Agreement target – have also raised concerns over inappropriate attempts to reduce the inherent complexity of nature conservation.

As such, enhancing issue salience without glossing over complexity remains a key challenge for biodiversity governance. Relatively straightforward (though not easy) interventions, such as the 30x30 campaign, might be part of the solution but do not present a silver bullet, given that they do not directly target the underlying drivers of nature decline, including agricultural intensification and unsustainable consumption and production patterns. In other words, they do not present effective leverage points for intervening in complex systems. As suggested by Donella Meadows (1999), the best place to initiate truly transformative change in socio-economic systems is at the level of the wider paradigms, value systems and goals that underpin their functioning. Currently, economic utilitarianism remains the primary lens through which we evaluate nature (Buller 2022), yet, the very real danger of ecological collapse should compel us to step back from purely anthropocentric concerns (Miller Smallwood 2021). Unless nature takes centre stage, humanity is likely to continue investing more resources into eroding biodiversity rather than protecting it.

Beyond the CBD: Other biodiversity-related treaties

Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES)

- Adopted: 1973
- Effective: 1975
- Parties: 183
- Secretariat: administered by UNEP

CITES provides a framework to regulate and restrict international trade in endangered plant and animal species. It covers more than 37,000 species which are categorised according to their conservation status in the Convention's three Appendices. The most stringent rules apply to Appendix I species which are threatened with extinction. Their trade is essentially banned,

except for very limited purposes. Appendix II lists species that are not imminently threatened with extinction but may become so unless their trade is tightly controlled. Appendix III species have been identified as being in need of protection by at least one state party, which needs cooperation of other parties in order to control trade. Appendices are updated every two to three years.

CITES is primarily implemented through national-level legislation and designated national authorities, who provide monitoring and reporting functions and are mandated to issue grant trade permits under the terms of the Convention. On the international level, CITES aims to encourage implementation through a combination of carrots (capacity building and technical assistance) and sticks (a gradually developed system of sanctions). Notorious violators face the possibility of being prevented from participating in any legal wildlife trade under the Convention.

Although CITES is, in regulatory terms, one of the most advanced biodiversity-related MEAs, illegal wildlife trade continues to thrive. With an estimated annual value of up to USD 23 billion, it is one of the largest transnational criminal industry, exceeded only by narcotics, counterfeiting, and human trafficking (Nellemann et al. 2016). CITES itself is neither mandated nor equipped to control wildlife crime and/or address its complex socio-economic and cultural drivers. Its success ultimately hinges on effective national implementation, which is frequently undermined by a lack of capacity, corruption or failure to obtain buy-in of local communities (Challender et al. 2015).

Convention on Wetlands of International Importance (Ramsar Convention)

- Adopted: 1971
- Effective: 1975
- Parties: 171
- Secretariat: hosted by the International Union for Conservation of Nature (IUCN)

The Ramsar Convention aims to promote the conservation and “wise use” of wetlands. Wetlands are among the most biodiverse ecosystems on Earth. They provide vital benefits to wildlife as well as humans, including through their critical role in regulating the climate (Mitsch et al. 2013). The Ramsar Convention is primarily being implemented through the designation of Wetlands of International Importance or “Ramsar Sites”. The management of these sites is largely left to the discretion of state parties, with the Convention playing a facilitative role through the provision of guidelines or the “red-listing” of deteriorating Ramsar sites (Bowman 2002; Hamman et al. 2019).

An interesting feature of the Ramsar Convention is its substantial engagement with several NGOs, which are integrated into all aspects of its work, from the provision of expert advice to field-level implementation support (Bowman 2002). The Convention also stands out as the only international agreement focusing on the protection of a particular type of ecosystem. Given its broad definition of “wetlands,” which includes marine and freshwater areas up to six metres deep, the Convention could help address interfacing issues, including those related to climate change (SDG 13), “life below water” (SDG 14) and “life on land (SDG 15) (Bridgewater and Kim 2021).

However, the Convention's narrow sites-based approach may stand in the way of addressing broader, more systemic causes of wetlands degradation (Bridgewater and Kim 2021). Currently, more than 2,400 wetlands in more than 170 states are listed as Ramsar Sites, covering a total area of over 2.5 million square kilometres. Despite this impressive achievement, the state of the world's wetlands is alarming. Wetlands are disappearing three times faster than forests, with about 35% of natural global wetland resources lost since the adoption of the Convention and 25% of wetland dependent species at risk of extinction (Ramsar Convention 2018).

World Heritage Convention (WHC)

- Adopted: 1972
- Effective: 1975
- Parties: 194
- Secretariat: UNESCO

The WHC establishes an international legal regime for the protection of cultural and natural sites of "outstanding universal value." Prospective sites are nominated by national governments and selected by the World Heritage Committee, the Convention's governing body, according to criteria outlined in the Convention's Operational Guidelines. States parties have an obligation to report regularly on the state of their sites. These reports may prompt the World Heritage Committee to take further measures to prevent the deterioration of sites, such as inclusion on the "List of World Heritage in Danger" or provision of emergency assistance.

Acquiring UNESCO World Heritage status often comes with significant reputational benefits, which can help public awareness, strengthen government commitment to site conservation, and open up new revenue sources, e.g. through tourism. State parties may also be eligible for direct financial assistance through the World Heritage Fund. While the WHC has undoubtedly been successful in terms of drawing attention to specific sites, critics have raised concerns that turning the Convention into a "grandiose marketing tool" has led to parties losing sight of its original aim, namely to foster international cooperation for heritage preservation (Keough 2011, p. 599).

A significant feature of the WHC is that it recognises the "complex interactions between mankind and the environment," linking nature conservation and cultural heritage. However, it remains underutilised with regard to protecting wilderness and biodiversity (Kormos et al 2015; Allan et al 2018). Although steps have been taken to make the list of World Heritage sites more balanced and representative, cultural sites continue to outnumber natural sites by a factor of about four to one and many regions of the world remain severely underrepresented (UNESCO n.d.b.). As a result, the WHC currently "provides no or little protection to many globally important wilderness areas" (Kormos et al 2015, p. 229).

The Convention on Conservation of Migratory Species of Wild Animals (CMS)

- Adopted: 1979
- Effective: 1983

- Parties: 132
- Secretariat: administered by UNEP

The CMS (also known as the Bonn Convention) provides an international regime for the protection and sustainable use of migratory species and their habitats. Many of the world's animal species, including about 40% of all bird species, regularly cross jurisdictional borders via land, air or sea. These species play a vital role in the functioning of ecosystems around the world. At the same time, they are particularly vulnerable to environmental changes and in need of cross-border protection for their entire range (Runge et al. 2014).

The CMS categorises migratory species according to their conservation status. Species threatened by extinction, listed in Appendix I of the Convention, are subject to immediate protection measures to be implemented by all state parties through which animals may pass ("range states"). Appendix II includes species with an "unfavourable" conservation status that would benefit from international cooperation. Range states are encouraged to foster cooperation on the protection of these species through targeted subsidiary treaties, Memoranda of Understanding (MoUs), or other arrangements.

The CMS serves primarily as a framework convention, aimed at promoting the creation of region- and species-specific conservation instruments rather than enshrining stringent requirements for state parties. To date, 7 legally binding agreements have been concluded under the CMS, along with 19 non-binding MoUs and 4 Special Species Initiatives. Despite the considerable number of instruments, many migratory species continue to decline (CMS 2020) and the CMS regime remains inhibited by a lack of participation, with notable absentees including the United States, Russia and China (Hensz and Soberón 2018).

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

- Adopted: 2001
- Effective: 2004
- Parties: 148
- Secretariat: FAO

The core objectives of the ITPGRFA are the conservation, sustainable use and equitable sharing of plant genetic resources for food and agriculture, while safeguarding farmers' rights. Plant genetic resources are key to global food security. In order to adapt to changing conditions, staple crops rely on a constant flow of new genetic information (Toledo and Manzella 2012). However, the last century has seen a serious decline in agricultural biodiversity and many of the crops and varieties that have been developed by farmers over millennia are being lost.

Beyond stipulating obligations on the conservation and sustainable use of all agricultural genetic resources, the ITPGRFA establishes a multilateral system of access and benefit-sharing, through which state parties agree to pool genetic resources for 64 crops that are especially important for global food security. These materials are not subject to intellectual property rights and may only be used for research, breeding and training activities related to food and agriculture. This multilaterally governed gene pool now comprises over 2.2 million

samples of plant genetic material, with more than 5.4 million sample transfers reported since its establishment (FAO 2019).

Benefits arising from the use of these resources are envisaged to flow primarily to farmers and scientists in developing countries. Mechanisms to support this include a Benefit Sharing Fund that is designed to return a share of the profits made through use of the multilateral system to developing countries where many of the genetic resources originate. Despite a "high level of commitment" from various stakeholders to the ITPGRFA (Halewood 2013, p. 280), implementation has not always been smooth, with continued disagreements between developed and developing countries on how to operationalise treaty provisions, including those on farmer's rights (Mwila 2012; Adhikari et al. 2021).

The International Plant Protection Convention (IPPC)

- Adopted: 1951
- Effective: 1952
- Parties: 184
- Secretariat: FAO

The IPPC aims to protect the world's plant resources, including both wild and cultivated plants, from the introduction and spread of pests. It does so primarily through setting standards to facilitate safe trade in plants or plant products. These standards (International Standards for Phytosanitary Measures or ISPMs) are recognised by the World Trade Organization (WTO) as the global benchmark for managing plant health risks associated with trade. This means that countries can, under certain conditions, apply the ISPM to restrict imports considered risky in terms of pest contamination or demand containment measures be taken by the exporting country.

The IPPC works closely with National and Regional Plant Protection Organizations (NPPOs and RPPOs) to implement and coordinate its core activities. Beyond standard setting, these include information exchange and capacity development to strengthen plant protection infrastructures and regulations, especially in developing countries. Nevertheless, efforts to promote plant health across the globe continue to be stymied by significant variation in national legislation and regulatory capacity (Eschen et al. 2015) as well as a lack of sustainable funding to support the work of the IPPC (IPPC 2020).

The International Convention on the Regulation of Whaling (ICRW)

- Adopted: 1946
- Effective: 1948
- Parties: 88

One of the oldest environmental treaties, the ICRW's core aim is the conservation and protection of all species of whales. To this end, it establishes the International Whaling Commission (IWC) which regulates the whaling activities of state parties. The IWC recognises three types of whaling, namely for (1) aboriginal subsistence, (2) commercial gain, and (3)

scientific purposes. All types of whaling are subject to quotas and restrictions, set out in a periodically updated “schedule”. Commercial whale hunting has been essentially banned since a moratorium was put in place in 1986. Over time, the role of the IWC has expanded beyond the regulation of whaling and, today, it works to address a range of related conservation issues.

The work of the IWC, and in particular the moratorium on commercial whale hunting, has been credited with saving several whale species from extinction. However, although the international whaling regime has been recognised as a “tremendous success,” it continues to be marred by deep divisions between anti-whaling forces and a handful of states that remain committed to whaling (Hurd 2012). Notably, Japan, which had previously justified its whaling operations as “scientific,” withdrew from the IWC in 2019 and is now openly engaged in commercial whaling in its exclusive economic zone.

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