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ORIGINAL PAPER

Lessons learnt in global biodiversity governance

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Abstract
INEA has featured many articles covering the dilemmas, puzzles, and tensions related to global biodiversity governance; this coverage was infrequent in earlier issues but has steadily increased as both environmental diplomacy and international law on biodiversity conservation and environmental justice have expanded. Using the definition found in the Convention on Biological Diversity, we scanned INEA articles and derived several lessons learnt over the 2000–2020 period. These include: implementation remains a central challenge, but challenge should not be conflated with ineffectiveness; multilateral environmental agreements are vital for success; coordination and policy coherences are often lacking, insufficient, or superficial; institutional change and policy reform within existing institutions are incremental at best; understanding local political dynamics is critical; equity concerns remain central to biodiversity policy development at all levels; the role of non-state actors and private voluntary standards fluctuates; tensions over state sovereignty and collective action and the commons have often been visible but as often lurk in the shadows of environmental diplomacy and most ongoing discussions of global biodiversity governance. After elaborating on each of these lessons, we offer some insights on research gaps and potential thematic directions for future contributors to INEA.

Keywords INEA · Biodiversity governance · Environmental diplomacy · Lessons learnt · Natural resources

1 Introduction

In the past decade, biodiversity conservation, law, and diplomacy have appeared with increasing frequency as themes in the *International Environmental Agreements: Politics, Law, and Economics* (INEA) journal. Biodiversity conservation has emerged not just as a policy problem for individual state governments, but also as a major diplomatic challenge and global collective action problem. This is hardly a novel realization. As

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Peter Sand reminded us in an early INEA article, U.S. President Theodore Roosevelt endeavored to convene a Hague Peace Conference on "global nature conservation" in 1909. By the late 1960s, it had become painfully apparent that biodiversity loss was an emerging global problem, and this was subsequently reflected in much of the agenda and outcomes of the historic 1972 United Nations Conference on the Human Environment (UNHCE) in Stockholm. Though the term "biological diversity" had yet to gather momentum, Principle 4 of the Declaration of the UNHCE states that "Man has a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat, which are now gravely imperilled by a combination of adverse factors. Nature conservation, including wildlife, must therefore receive importance in planning for economic development."

20 years later, the Earth Summit of 1992 (the United Nations Conference on Environment and Development, or UNCED) produced the Rio Conventions, one of which was the Convention on Biological Diversity (CBD), amidst growing dismay that Amazonian deforestation and the overexploitation of wildlife, despite the 1972 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), were threatening the fabric of life on earth. Almost 30 years after UNCED, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment was released, and the results were chillingly clear: despite increased scientific knowledge, national planning, and international collaboration, there has been an astounding loss of biodiversity at the global scale (IPBES, 2019). Currently, more than 25% of assessed species in animal and plant groups worldwide are declining, "suggesting that around one million species already face extinction, many within decades, unless action is taken to reduce the drivers of biodiversity loss" (IPBES, 2019: 10). The most important direct drivers of biodiversity loss are changes in land and sea use, together with the over-exploitation of organisms, climate change, pollution, and invasive alien species (see Batanjski, 2016). Moreover, biodiversity loss is now widely recognized as not just a global problem, but as an equity and environmental justice issue, since its immediate impacts are differentiated according to income and resource dependence. In particular, Indigenous People and Local Communities (IPLC) face existential physical, socio-economic, and cultural threats due to biodiversity loss (see Cariño & Ferrari, 2021; IPBES, 2019).

By the time the CBD adopted the Aichi Targets in 2010, it had become apparent that the situation was worsening, and that formal international collaboration was not only failing but, according to some, was doing "more harm than good" (Jóhannsdóttir et al., 2010). None of the 2020 targets were met; in most cases, we are further behind meeting them than we were in 2010. Efforts to craft a new set of 2030 biodiversity goals are near completion, but the biggest lesson learnt over the preceding four decades may well be, sadly, that we are failing to live up to the Principle enunciated at Stockholm, and on a massive scale.

Questions related to the governance of biodiversity conservation, the political economy of biodiversity loss, the growth and governance functions of non-state actors (Green, 2018), and many others have been approached by scholarship from diverse disciplines such as political science, international relations and law, geography, and anthropology (see for example Kirton et al., 2002; Swanson, 1994). A substantive increase in related expertise, collective action, and collaboration across governments is easily discernible to even a casual observer over the last 20 years. It comes as little surprise, then, that there has been a marked increase in the number of articles published dealing with some form of biodiversity governance issue in a journal such as INEA. This article will highlight some of the more prominent *lessons learned* from biodiversity-related international law and global governance found in the archives of the journal, and draw some conclusions about both extant

gaps in the literature, and future research paths which could position INEA as a leader in the public scholarly discourse in this area.

In order to scan the material published over the first 20 years of INEA, we adopted a wide employment of the term biodiversity, borrowing from the definition found in Article 2 of the 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.

Using this broad-brush definition, we were able to move beyond the narrow framing of biodiversity to also include articles covering closely related topics such as natural resources, ecosystem restoration, protected areas, genetic resources, and access and benefit sharing of these resources. Following this definition, which asserts that biodiversity is not only an empirically biological phenomenon but (following on discourse analysis and other constructivist approaches) also a political space—albeit a highly fragmented and often contentious one—at the genetic, species, and ecosystem levels, we were able to identify several recurring themes that have appeared in INEA articles since the inception of the journal in 2000. Initially, we purveyed the abstracts of journal articles and looked for key concepts and themes that would fit within this definition. After an initial division into empirical themes, we moved to an in-depth reading of each article and proceeded to derive a set of "lessons learnt" from them, which we explicate in the following section. Some preliminary remarks follow.

From an academic viewpoint, it is interesting to note that some terms and concepts are picked up, while others are not. For example, Filoche refers to "biodiplomacy" as "the field of diplomacy that focuses on negotiations regarding the conservation and sustainable use of the world living resources"; (Filoche, 2013:178n1; he also cites Juma, 2005). Yet, we do not see the term mentioned again in subsequent issues of INEA, even if the term formed a conceptual core of a United Nations University project that ran from 2004 to 2018 (UNU, 2021). It does re-emerge in two interesting contexts: as a hybrid Foucaldian take on "beyond governmentality in international negotiations" (Constantinou & Opondo, 2019) and as the "new frontier for bioeconomy" (Aguilar & Patermann, 2020). Another term that has gained some momentum that may be of interest to international relations scholars is the reference to leaders in biodiversity-related initiatives as "normative powers"; for example, Liu (2018) exhorts the European Union to demonstrate its validity as a normative power by supporting the establishment of more marine protected areas in Antarctica. The phrase gained some momentum in the broader international relations literature, but has limited application elsewhere in INEA despite the clear centrality of norms, values, and leadership.

We do not attempt to ascertain why some themes have garnered broader coverage than others in the journal, but suspect in many cases that the timing of their appearance follows real-world events. For example, many papers cover various aspects of genetic resources, especially access and benefit sharing, but most of them appeared after the adoption of the Cartagena (adopted in 2000, entered into force in 2003) and Nagoya Protocols (adopted in 2010, entered into force in 2014) (Atisa, 2020; Birhanau, 2010; Filoche, 2013; Humphries, 2018; Nijar, 2013; Nijar, 2017; Rosendal, 2016; Schulz, 2017; Tidi, 2019; Zainal, 2015). Similarly, several papers reflect advancements in environmental diplomacy while covering protected areas and habitat conservation (Sand, 2001; Wilson, 2008); natural resource management and sharing (most visibly, fisheries: Axelrod, 2017; Haas et al., 2021; Kim, 2019; Pentz & Klerk, 2020) and, especially, forestry (Bezerra, 2018; Fernandez-Blanco,

2019; Gulbrandsen, 2005; Heim, 2018; Ituarte-Lima, 2019 Kalaba, 2014; Mbatu, 2016; Pattberg, 2005). Others are better considered as "crossover" papers which examine overlapping regimes (Rosendal, 2001; Velázquez Gomar, 2016), partnerships (or "soft imperialisms") (Afionis & Stringer, 2014; Mbatu, 2016), or utilize comparative analysis (Atisa, 2020; Bezerra et al., 2018; Gulbrandsen, 2005; Humpries, 2018). A more limited set of articles focus on agency, and on specific actors' strategies and interests, and their implications for political outcomes achieved in biodiversity governance (Axelrod, 2017; Groen, 2019). The creation and, arguably, growing influence of IPBES has inspired two articles (Dunkey et al., 2018; Koetz et al., 2012) and will probably result in more submissions in light of the widely recognized expertise and urgency of the global assessment published in 2020.

However, as this special issue of INEA is focused on "lessons learned", we organize the bulk of our discussion along those lines, instead of using the thematic categories discussed above.

2 Lessons learned

2.1 Implementation remains a central challenge, but challenge should not be conflated with ineffectiveness

One of the more evident, and evidently painful, lessons learnt is that when it comes to international principles, agreements, and protocols, as well as domestic policy development, *implementation is very hard.* Governance conditions will affect this as much as resource capacities but in certain areas such as the horn of Africa it has been exceptionally difficult to implement overarching biodiversity governance principles, as Birhanu's analysis of access and benefit sharing in Ethiopia made clear (Birhanu, 2010). Moveover, Kalaba et al. (2014) finds that national statements made by Zambia in relation to the Rio Conventions differ from the country's national forests policy, and concludes that ratification of international conventions does not guarantee effective implementation at national level. Sand identified three main characteristics in his comprehensive survey of conservation regimes back in 2001: "Close interdependence of national and international regulation… active participation by non-state actors, as 'custodians ' of community interests; and a broad range of innovative techniques to ensure and control compliance transnationally" (Sand, 2001: 34). These remain necessary, if not sufficient, ingredients for success today, but ensuring these overlapping characteristics are all present is difficult.

Implementation is particularly challenging when new regimes call for substantive domestic legal innovations. As Nijar (2013) points out, the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety demanded that governments enacted an administrative approach (based largely on a problematic EU model) as opposed to a more easily implemented civil liability approach, hampering implementation. At the same time, Nijar also pointed out that this result was almost impossible to avoid, given the disparate preferences of negotiators (see also Groen, 2019). And there are often cases where institutionalized uncertainty is the norm, making the implementation of clear guidelines exceptionally difficult (e.g., with policies surrounding Genetically Modified Organisms: see Zainol et al., 2015). At the same time, it is important to recognize that, overall, most international agreements on biodiversity issues have achieved some level of effectiveness. For example, while gaps remain, a recent publication

in INEA demonstrates that the Bern Convention has had a positive impact on environment and wildlife-related legislation, if less on judicial decisions, in Turkey, though this is probably as much a reflection of Turkey's long-term desire to join the EU as it is of the prowess of the Bern Convention (Elvan et al., 2021).

2.2 Multilateral environmental agreements are vital for success

Another lesson learnt is that multilateral environmental agreements are vital for success, since they can provide spaces for negotiation, lend prestige to projects, generate solid scientific advice, and ensure that adequate resources can be devoted in necessary fashion.

This is supported by Law and Kriwoken (2017) in their study of two policy processes related to the Tasmania' tall-eucalypt forests inscribed under the World Heritage Convention (WHC). They conclude that multilateral environmental agreements can play a critical role in biodiversity protection, as they can assist key agents to transcend shifts in domestic politics and provide more long-term environmental protection, particularly when backed up by domestic mobilization and community support. Mbatu (2016) also finds that the international forests regime, consisting of various international agreements, protocols, treaties, and institutions, as well as by participating transnational actors, have been critical for the development of the national forest policy in Cameroon. Multilateral agreements can be ignored or even rejected by new policy makers, but they are as likely to lend stability and sustainability to the process of policy design and jurisprudence.

Alvarado-Quesada and Weikard (2017) take a game theoretical modeling approach and suggest that it may be more effective in terms of conservation to establish several partial agreements, composed of countries of the same type (in terms of benefits and costs of conservation) rather than a single international agreement. The article is however less concrete about how such regimes are to be established, given the existing institutional landscape. Bezerra et al. (2018) studied regional regimes that have emerged alongside international regimes in forest governance and argued for their importance. They find that these regional regimes vary in terms of institutional design, which mainly depend on the formality of the regime and the power structures and the presence of what they call "regional hegemons" among regime members. Groen (2019) instead studies state negotiation strategies, by focusing on the effectiveness of the EU to achieve its goals across three CBD negotiations processes. They find having a high degree of bargaining power combined with taking a middle position (in the broader constellation of interests) most often lead to high goal attainment, as it positioned the EU as a bridge-builder that could propose solutions.

Bilateral arrangements, on the other hand, including those between donor and recipient countries, are generally insufficient while the globalization of trade commences and, in some sectors with direct impacts on biodiversity, grows. Birhanu made this point forcefully clear in his discussion of Ethiopian access and benefit sharing law, in the pre-Nagoya protocol context (2010). Others have suggested that, even when there is a clear state leading the international community (such as Norway with the implementation of a global access and benefit sharing regime) reliance on individual countries is less than optimal, especially when there are inevitable fissures within that country that reflect broader divisions (see Rosendal & Andresen, 2016; see also Schulz et al., 2017 on the role played by the Swiss). While there have been demonstrated cases of bilateral success, for example the collaboration between Chile and Argentia in coping with the expansion of invasive alien species (in particular, the North American beaver) in Southern Patagonia, even in these cases efforts have generally been buttressed by the science and policy advice and funding potential of

multilateral institutions or, putting it more bluntly, "international actors were recognized as part of the process for achieving a solution because of the two types of resources they possess: experts and financing" (Lorenzo et al., 2018: 805).

2.3 Coordination and policy coherences is often lacking, insufficient, or superficial

An additional lesson learnt is that coordination and policy coherence across international institutions dealing with partly overlapping issues, goals, and functions in biodiversity governance is often lacking, insufficient, or superficial. Already in the first issue of INEA, Sand (2001: 37) noted that "the proliferation of institutions and instruments is indeed a governance problem of its own in this field. There have been numerous attempts at coordination and at the promotion of presumed synergies, albeit so far to little avail."

This view is reinforced by several papers over the past 20 years. For example, Rosendal (2001) found that it was not possible to achieve linkages across the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Forum on Forests (IFF), in part due the inherent goal conflict between viewing forests as a carbon sink or as a repository for biodiversity. On the other hand, it was possible to link largely compatible norms across IFF and the CBD, due to overlaps in membership and a high awareness of issues. Fernandez-Blanco et al. (2019) found more evidence for conflict than synergy across the goals of 40 international institutions addressing biodiversity. Importantly, the synergies that were identified across different institutional goals remain "very general, content-poor, unspecific, non-concrete" even though being high-level and highly visible (Fernandez-Blanco et al., 2019: 199). They identify several conflictual relations across institutions which have implications for implementation and ultimately for the effectiveness of the regime complex around forestry. Goal conflicts were particularly prevalent across trade-conservation elements, across elements supporting indigenous peoples as civic actors or those explicitly strengthening national governmental actors, as well as across elements focusing on carbon sequestration (as part of REDD+) and forest certification for sustainable use. These findings illustrate the challenges of policy coherence across different institutional elements that make up the international forests regime, be it across trade-conservation, or climate-biodiversity concerns, as well as longlasting conflict between IPLC versus national interests, which is prevalent in biodiversity governance more broadly.

In addition to conflicts across goals of international institutions, cooperation and coordination across institutions with partially overlapping functions remains limited. For example, Haas et al. (2021) find very little evidence of cooperation and coordination across Regional Fisheries Management Organizations (RFMOs) and other international institutions that deal with oceans and fisheries related issues, such as the International Seabed Authority (ISA), the International Maritime Organization (IMO), and the International Labour Organization (ILO). This is a common refrain among those active in international diplomatic circles today: there are too many organizations trying to do the same thing, yet inter-organizational cooperation is limited by several factors, including political restrictions. For example, the CBD (which does not include the United States as a formal party) does not even have Observer status at the World Trade Organization, despite the centrality of the Sanitary and Phyto-Sanitary Agreement to the fight against invasive alien species (the FAO's International Plant Protection Convention does, however).

Another lesson learnt is that the lack of coherence across policies occurs both vertically across the national and international level, but also horizontally across different sectors relevant for biodiversity across the national level. For example, Kabala et al. (2014) identify negative policy interactions between national policy related to forests and agriculture in Zambia, which impedes the ability to reach internationally set goals. Furthermore, as Moynihan and Magsig suggest, there is a significant governance gap in terms of the interlinked ecosystems of freshwater rivers and oceans: they examine the disjointed nature of the 1997 UN Waterways Convention and the 1982 UN Law of the Sea Convention, concluding that positioning "the ecosystem approach more explicitly at the center of international and regional freshwater and oceans regimes would enable these regimes to more adequately address transboundary environmental harm, including from land-based sources of pollution" (2020: 665). They find more suitable legal regimes to protect freshwater in regional arrangements, such as the Danube River Protection Convention of 1994.

Velazquez Gomar (2016) similarly notes the large number of multilateral environmental agreements that have been adopted and designed to protect the environment. The author argues that the main challenge is not the fragmented institutional landscape in itself, but rather the lack of effective coordination and policy integration across agreements. The article considers coordination and policy integration across the CBD Convention and five specialist regimes: (1) the 1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention); (2) the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage (WHC); (3) the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); (4) the 1979 Convention on the Conservation of Migratory Species of Wild Animals (CMS); and (5) the 2001 International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). On the positive end, the author finds that policy alignment is gradually emerging across these institutions with the CBD at the center and writes about the "CBD-ification" process whereby older conservation-focused agreements increasingly have embraced the CDB's main mission, the ecosystem approach, and the principles of sustainable development. At the same time, the authors find that there are some difficulties to align the work that remains, especially when it comes to technical issues typically carried out by the specialist regimes. Importantly, Velazquez Gomar (2016) finds that the topic of synergies across these biodiversity conventions lack sufficient salience for state actors to become sufficiently involved to push the issue and that current efforts have been conducted by the secretariat of the conventions themselves. In terms of lessons learnt, the author proposes that the most effective way to create more synergies is to support national-level synergies, as a way to get state actors onboard, enhance political will and ultimately promote political ownership over the issue. Synergies created from the bottom-up may not solve fragmentation of the biodiversity regime as a whole, but can help tackle some of the problems with low political salience and lack of state engagement.

2.4 Institutional change and policy reform within existing institutions is incremental at best

Earlier articles reflected the predominant concern with regime building in mainstream international relations literature (e.g., Rosendal, 2001; Sand, 2001). As Jeremy Wilson notes, this consisted largely of a "trio of concepts introduced in the transnational environmental politics literature: transgovernmental coalitions, epistemic communities, and transnational advocacy coalitions" (Wilson, 2008: 210). No doubt, we are still concerned with

these factors, but the contemporary literature has generally gone beyond this and moved toward more integrated policy analysis, inspired by innovations such as Oran Young's conception of institutional overlap across international regimes, vertical and horizontal institutional interplay (Young & Schram, 2020; Young, 1996, 2002) and the notion of institutional fragmentation (e.g., Biermann, 2009).

Institutional change (Axelrod, 2017) and policy reform (Pentz & Klerk, 2020) of the existing international institutions are both extremely difficult to achieve. Though the International Whaling Commission went through a normative transition as anti-whaling sentiment became the majority position (Sand, 2001; Stoett, 2002) this is clearly an anomaly within the natural resource/biodiversity governance regimes. In the international fisheries regime, this seems to be related to the long history of parts of institutions, the preferences of some states and the changing geopolitical context related to fisheries. For example, Axelrod argues that the difficulty to achieve institutional change is the result of active engagement by states like the US and the EU member states whose domestic fishing industries continue to benefit from the status quo. This is particularly the case as catches from the US and EU fleets currently represent a declining account of total global catches and as other states have emerged as major fishing nations. In terms of lessons learnt, the author concludes by proposing that a possible alternative route to improve international fisheries institutions would be to shift the venue, rather than trying to change existing institutions.

Pentz and Klerk (2020) question the extent to which Regional Fisheries Management Organizations (RFMOs) will be able to integrate consideration for climate change adaptation into their mandate, alongside management of transboundary fish stocks. They find that the institutional design of RFMOs tends to lead to slow incremental policy reform, rather than transformative policy reform, and that RFMOs as a consequence, are unlikely to depart too much from the status quo. In terms of lessons learnt, they argue for a combination of incremental reforms from within existing governance structures (by making climate change adaptation part of existing policy design) and transformative reform of institutional design aspects (by reforming decision-making process and the consensus norm). Haas et al. (2021) consider the potential of RFMOs to contribute to the implementation of Sustainable Development Goal (SDG) 14. The authors highlight that RFMOs are already contributing to goals such as ending overfishing, as highlighted by SDG 14. In order to better contribute to the implementation, the authors suggest that RFMOs should cooperate and coordinate their work with other international marine institutions such as for example the International Seabed Authority, the International Maritime Organization, or the International Labour Organization. Again, inter-organizational collaboration emerges as a central need for effective biodiversity governance.

2.5 Understanding local political dynamics is critical

Another lesson learnt is the need to investigate local political dynamics, including relations between resource users and providers within countries and between them, if we seek to understand the functionality of international regimes. Filoche (2013) makes this point clearly in his discussion of genetic resource regimes in Brazil and French Guiana, as there were shifts in orientation and implementation that reflected distinct approaches to the roles of users and providers of genetic material and North–South relations (Filoche, 2013). (Anyone denying the significance of national politics need only look as far as the elections of Donald Trump and Jair Bolsonaro as profound evidence to the contrary.) And the point is certainly hammered home by Marsden (2018), who demonstrated the impending

uncertainty over conservation policy and options as Brexit was nearing Scotland, despite overarching convention architecture offered by the Aarhus Convention on public participation, the Ramsar Convention, the Bern Convention, and others; and Guarino et al. (2017), who explore the role agriculture plays in linking ecosystems with "techno-systems" in Italy. Lim (2016) also emphasizes the importance of understanding each level of political organization for effective transboundary biodiversity governance.

Regarding the challenge of enhancing compliance with international regulations, Kim (2019) emphasizes the importance of the institutional design of the regulation itself. By studying two different cases of detected noncompliance with international fisheries law, the author concludes that the EU's yellow card issued directly towards Korea was more effective than the listing of Korean flagged vessels on the list of Illegal, Unregulated and Unreported (IUU) fishing vessels under the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), since it targeted the state directly. In addition, social context matters for changes to compliance. The EU yellow card was more effective in triggering Korea to act than the CCAMLR IUU listing since the former was issued at the same time as a number of other yellow cards towards other states were issued by the EU, which Korea did not wish to be associated with as they were low-income countries. The EU is also a more well known institution than CCAMLR among the general public in Korea, which enabled NGOs to effectively name and shame Korea for non-compliance and led to the issue being featured in national media.

Axelrod (2017) studies the engagement by the EU and US (still perhaps the most important fishing states from a global governance perspective, despite overall decline compared to China and others) in international fisheries negotiations. In terms of lessons learnt, the author finds that these two countries together with their national fishing industries are eager to keep the status quo as this situation ultimately lies in their own interests and that this in part hinders institutional change when it comes to how fisheries are governed. Moreover, the author finds that a country's negotiating position is affected by the access provided to domestic stakeholders, who wish to gain and fear losing from new agreements.

Rosendal (2001) and Fernandez-Blanco et al. (2019) both illustrate how strong vested interests at the national level have been successful in shaping the development of international institutional arrangements and that such interests have benefitted from the fragmented landscape and lack of coordination across international institutions in the forest regime. Rosendal (2001) notes that those that have been advocating for economic interests of the timber industry that had few incentives to oppose the Kyoto regulations, as they fit with the position that timber production is a more important concern than the protection of wildlife or the rights of indigenious peoples and local communities. In this way, timber production was considered a national concern, while concerns for biodiversity and indigenous peoples became associated with global and local levels.

2.6 Equity concerns remain central to biodiversity policy development at all levels

Despite ongoing efforts at every level and the adoption of the Sustainable Development Goals (SDGs) by the member states of the United Nations, many equity concerns remain a major challenge in biodiversity governance. For one, goals related to access and allocation remain largely unmet. According to Coolsaet et al. (2020), one issue is that most approaches to access and allocation in practices are conducted through benefit-sharing mechanisms that tend to overlook the capabilities of local communities to benefit in the long run. These benefit sharing mechanisms are challenging to implement and often lead to

elite capture, disempowerment of local communities, enhanced poverty, and dispossession of natural resources.

Existing institutional frameworks in biodiversity governance also tend to disadvantage Indigenous People and Local Communities (IPLCs). For example, Ituarte-Lima et al. (2019) finds that the "legality movement" in biodiversity governance, present in trade measures such as the European Union Timber Regulation (EUTR), runs the risk of reinforcing legal frameworks that benefit large-scale export production while deeming local customary laws as legitimizing "illegal logging", with negative consequences for IPLCs who are reliant on this source of income. This is a much broader concern that continues to influence the effectiveness of wildlife trade regulation as well as protected area conservation efforts: the buy-in of local communities (including prior, informed consent) is an integral aspect of policy development (see Challender et al., 2015). As Atisa (2020: 142) explains, "environmental policies, legislation, and regulations should go beyond the political and technical aspects because biological resources constitute the life-sustaining natural world for all living beings. Therefore, their use can only be managed, not curtailed, as people whose lives depend on such resources will continue to use them regardless of whether they are protected. This is evident in most protected forests that continue to experience illegal logging operations and fuelwood harvesting that has had negative impact on vertebrate species whose lives depend on intact forest ecosystems' systems."

Despite a conscious effort to overcome the gap, the incorporation of indigenous and local knowledge into the robust work of IPBES continues to be a challenge. For example, Koetz (2012) and Dunkley (2018) study institutional design aspects of IPBES and its (in) ability to integrate indigenious and local knowledge. Koetz (2012) suggests that the design of IPBES has the potential to overcome institutional mismatches between the nature of the problem, i.e., 'biodiversity loss" and the institutional arrangements set up to address it, but concludes that this potential remains unrealized as IPBES continue to apply a largely linear rather than a collaborative approach effectively limiting the ability to integrate diverse knowledge systems. Dunkley (2018) corroborates this view and finds that IPBES largely has been unable to integrate diverse knowledge systems into their work, since its scientific work remains based on Western worldviews (reinforced by existing power inequalities) and a narrow scientific paradigm that effectively excludes local and indigenous knowledge systems. These articles both illustrate the tension between different knowledge systems, and how it feeds into ideas of science-based decision-making, with implications for the effectiveness of the IPBES to act as a boundary object in the science-policy interface. Relatedly, several authors also question the legitimacy of IPBES and global governance institutions (the CBD and IWC)—given the inability of such top-down structures to include diverse knowledge systems and perspectives beyond Western perspectives (Dunkley, 2018; Koetz, 2012; Stoett, 2002).

It seems clear that equity concerns will always be central to the study of global biodiversity governance, given that gross inequity is such a strong defining characteristic of the international economy and political systems, and that these debates will be framed in various ways. For example, there are concerns with the relative importance of, and benefit sharing regimes associated with, commercial versus non-commercial research, especially into genetic material (Nijar et al., 2017; for a discussion on the sharing of non-monetary and monetary benefits of marine genetic resources in areas beyond national jurisdiction see Tladi, 2019: 490–91). Concerns over the continued colonial project, both in terms of physical extraction of natural resources and associated epistemic violence, also continue; for example, Ituarte-Lima and colleagues 2019 question the legality turn in forestry—arguing that it disadvantages the rights of and disempowers indigenous people and local

communities (Ituarte-Lima et al., 2019). They propose that the post 2020 global biodiversity framework should incorporate a rights-based approach, in order to shift from a focus on legality to legally empowering local forest producers to exercise their right to protect and sustainably use forest diversity.

We have certainly not eclipsed the traditional North–South divide in global environmental governance, but many of the issues we are dealing with today are even more complex. This relates not just to the fair treatment of different knowledge and belief systems, but to the material needs of those most affected by biodiversity loss and climate change, as well as the ability of non-state actors to participate in governance structures and processes; this latter point leads to our next lesson learnt.

2.7 The role of non-state actors and private voluntary standards fluctuates

Biodiversity politics is, not surprisingly, well-known for its fascinating political diversity, as different kinds of non-state actors, from NGOs to corporate actors, and the use of private voluntary standards, play important governance functions in biodiversity governance. Sand (2001) noted that "innovative governance features highlighted in the field of global living resource management include active NGO participation". Gulbrandsen (2005) and Pattberg (2005) study and scrutinize the role of private voluntary standards in forest governance partly set up and supported by international NGOs. Mbatu (2016) recognizes the role of transnational actors, including NGOs, in shaping national forest policies in Cameroon and in enhancing the integration and implementation of the international forest regime.

Kim (2019) finds that NGOs mattered for improving compliance with IUU fishing regulations in two ways. First, NGOs provided information to the EU Commission, which later issued a yellow card against Korea. Second, NGOs were able to raise domestic public concern related to the yellow card, which was important for Korea's motives to act and quickly address the problem. Finally, Weber (2018) focuses on the increasingly prominent role of multinational corporations (MNCs) as political actors in global governance, by studying the motives of MNCs whose core business links to deforestation for performing sustainability activities at firm level. The author finds that corporations respond to activities that could lead to reputation damage (for example NGOs use of naming and shaming strategies), but question whether this translates into action beyond engaging in business-lead coalitions and making public pledges to address the problems.

Relatedly, Fernandez-Blanco et al. (2019) conclude that the fragmented international forest regime and the array of non-legally binding and voluntary regulatory landscapes have benefitted the interests of the forest sector. They propose that the establishment for private voluntary standards certifying "sustainable forestry" has legitimized timber and harvests practices which "care for nature".

Of course, the non-governmental actor has not supplanted the state as the main policy actor, but there are numerous strains on this ownership, which leads to our last lesson learnt.

2.8 Tensions over state sovereignty and collective action and the commons have often been visible but as often lurk in the shadows of environmental diplomacy and most ongoing discussions of global biodiversity governance

As Schrijver (1997) concluded, state sovereignty over natural resources is coupled with great responsibility. Governmental actors have enviable opportunities to act as the

normative leaders in policy development and dissemination during the process of environmental diplomacy. This is perhaps most noticeable in the early stages, when government agents can choose to exhibit what one INEA article refers to as leadership via "assuming entrepreneurial and intellectual leadership and by shrewdly taking advantage of windows of opportunity in an early phase" (Schulz et al., 2017: 555); the authors also refer to the "close collaboration of the Swiss and Norwegian delegations [which] was conspicuous" (ibid 565; see also Rosendal & Andresen, 2016).

The role of the state remains contentious in some respects; for example, there is ongoing tension between the concepts of "common heritage of [hu]mankind", and access and benefit sharing, the idea that biodiversity is an integral aspect of the commons (as in, for example, the ongoing negotiations over biodiversity beyond national jurisdiction) and seemingly permanent issues related to sovereignty, the presence of domestic economic interests and state capture, and patterns of privatization and enclosure. What happens in a world where conflict between corporations over genetic material, for example, is as dominant an issue as any North–South or intergovernmental collaboration?

As Fran Humprhries (2018: 543) explains in her analysis of the global tilapia trade, "The ABS [access and benefit sharing] concept under the CBD highlighted a shift from treating genetic resources as the common heritage of humankind towards recognising the rights of countries over those resources and the regulation of their use […] The concept largely arose from conflict over terrestrial genetic resource exchange, which produced the predominant territorial and transactional approach to ABS regimes. As a generalization, when the CBD was under negotiation, terrestrial resource conflict was between 'South' developing nations where the majority of genetic resources for global crops originated and 'North' developed nations who profited from technologies arising from their use." She concludes that "territorial focus of the CBD does not necessarily reflect the patterns of exchange and conflict when it comes to aquaculture genetic resources" (Humphries, 2018: 543) where conflicts are more likely to arise between small and large-scale private actors rather than countries.

Articles that take an integrated approach to ocean governance are for the most part lacking in the journal's history. The international fisheries regime, based on the UN Law of the Seas (UNCLOS) and whose implementation centers around a network of RFMOs has been increasingly scrutinized in past decades. RFMOs have been criticised for being largely ineffective in reaching their overarching goals of conserving and managing shared fish stocks sustainably (Cullis-Suzuki & Pauly, 2010). Recent INEA papers illustrate how achieving institutional change (Axelrod, 2017) and policy reform (Pentz & Klerk, 2020) that would enable the RFMOs to address problems with overfishing, bycatch and IUU fishing more effectively (Haas et al., 2021; Kim, 2019), and beyond that, also address issues such as climate change adaptation (Pentz & Klerk, 2020) and implementation of the SDGs (Haas et al., 2021) remain a considerable challenge. As mentioned above, this is partly due to the reluctance by some powerful states that continue to enjoy the benefits of status quo and that fear to lose such benefits as the geopolitical landscape continue to change (Axelrod, 2017) and shaped by the institutional design of RFMOs and the consensus decision-making norm (Pentz & Klerk, 2020). Some propose that a new institutional venue would be best for addressing these shortcomings (Axelrod, 2017), while others propose that changes can be achieved within existing institutions through transformative policy reform (Pentz & Klerk, 2020). In parallel, ongoing negotiations are being carried out by the BBNJ negotiations to establish a new binding legal instrument. The inclusion of fisheries and the work of the RFMOs are still uncertain within these negotiations, which cannot "undermine existing relevant legal instruments and frameworks and relevant global, regional, and sectoral

bodies" (UNGA, 2015). There is currently a lively debate about the most appropriate way to ensure that marine biodiversity, including fish, are conserved and sustainably managed (see e.g., Clarke, 2020). Thus far, very few INEA papers cover the BBNJ negotiations and potential implications across areas of marine biodiversity (however see Tladi, 2019) or associated area-based management tools such as marine protected areas (MPAs) (however see Liu, 2018 on Antarctica and Southern Ocean MPAs and the European Union). The Antarctic region and CCAMLR could also use some more attention in INEA, since it has not been covered directly over the previous 20 years (see Chown, et al., 2017).

3 Moving forward: intriguing research gaps

> Biodiversity protection is more effectively implemented through clear policies, regulations, agreements, and institutional arrangements across governments, non-governmental organizations, private sectors, and communities […] While the international community does not impose conformity on countries, many countries use the top-down demand for conformity by local jurisdictions. […] However, the success of top-down regulations depends on the design and suitability of policies in supporting local conservation initiatives and interests and the level of penalties for non-compliance. (Atisa, 2020:145).

All of the issue-areas discussed above will doubtlessly generate more research in the near future; below, we single out a few others that we feel could capture the imaginations of contributors to INEA, while agreeing with Atisa's general formulation above: global biodiversity governance involves a variety of regulatory implements, will never be free from challenges to its legitimacy, and is inevitably polycentric and fragmented in character..

This essential, if often frustrating, fragmentation of governance will doubtlessly continue to drive research (see Biermann et al., 2009). For example, recent INEA contributions paint a picture of a highly fragmented forest regime and illustrate the challenges of achieving effective governance given the lack of coordination and coherence across goals and policies (Bezerra, 2018; Fernandez-Blanco, 2019; Ituarte-Lima, 2019; Kalaba, 2014; Mbatu, 2016; Law & Kriwoken, 2017). Across the wide spectrum of biodiversity issues, future research could examine questions such as: under which conditions do international institutions best coordinate their efforts? What room is there to increase coordination and coherence as part of the ongoing negotiations for a post-2020 biodiversity agenda? Which networking and community-building approaches provide the best means for international institutions and political actors engaged in and with them to contribute to better policy coherence both across international institutions and across scales, from local to national and international levels?

We are just beginning to see scholars respond to the twinned questions of competing priorities (energy production, biodiversity conservation, eradication of invasive species, carbon sequestration) and institutional changes that are currently taking place; these themes come together, for example, in Simon Marsden's piece on protecting wild lands in Scotland from wind energy development in a post-Brexit United Kingdom (Marsden, 2018). Future research could ask how such priorities play out across different issue areas relevant for biodiversity governance; this is tied very closely to the potential for enhancing coordination and coherence across these sectors, and will contribute to ongoing nexus debates and IPBES assessments.[1]

[1] IPBES has expanded its reach with assessments based on explicit coverage of thematic nexus points, as well as by working with interdisciplinary expert groups and other environmental science-policy interface organizations. Ongoing or future assessments and other fora include: Thematic assessment of invasive alien

The application of criminal law, in the form of possible charges against individuals, corporations, or governments engaged in ecocide, has not been treated at length in INEA articles to this point, though Batanjski et al. do suggest improving the Ramsar Convention, for example, by "adding articles that oblige individual states to incriminate violations of the Convention, either as criminal offenses or as misdemeanors, in their national legal sources… incriminating unacceptable human behaviors against the environment—in this case the failure to prevent an occurrence and eliminate the IAS [invasive alien species] in wetlands as natural and semi-natural habitats as criminal offenses—should be considered as a solution" (Batabjski et al., 2016: 844). With the transnational movement to arrive at an enforceable definition of ecocide at a global level, more attention may be paid to criminal law by INEA contributors. Expertise from legal experts from the Southern hemisphere will be especially welcome.

In biodiversity conservation and law, it is readily apparent that science, and the scientific epistemic community, plays a key role. As Wilson reminded us in 2008, in the absence of a "strong scientific base, conservation communities can neither set conservation policy priorities, nor offer convincing arguments about how policy interventions ought to be targeted" (Wilson, 2008: 224). IPBES assessments (completed and forthcoming and future) will provide ample material for analysis. They are derived largely from Scoping Documents constructed by expert working groups and approved by member states and present the most recent scientific data as well as governance issues and possibilities. An interesting question will be whether IPBES assessments have had a discernible impact on government policy and international collaboration. Indeed, as implied earlier in this article, the ability of the IPBES to provide appropriate scientific advice as a basis for effective and equitable biodiversity governance also relies on its ability to integrate different knowledge systems, notably by ensuring that indegenous people and local communities' knowledge are integrated into the assessment process (Dunkley, 2018; Koetz, 2012).

Meanwhile, it is likely that progress (or lack thereof) toward the new global biodiversity goals, soon to be adopted by the CBD and in line largely with the SDGs, will be followed with intense scrutiny. As this special edition of INEA moves to press, the CBD is close to adopting its 2030 targets. Coolsaet et al. (2020) argue that the post 2020 global biodiversity framework should (1) include specific targets or more gender-responsive and equitable access and allocation arrangements which recognize local land tenure rights, (2) develop monitoring and evaluation systems that address access and allocation, along with other social and economic dimensions of biodiversity governance, and (3) feature implementation mechanisms, including funding, which explicitly incorporate equity dimensions of biodiversity governance. So far it does not look like all their demands will be met once the diplomatic dust settles and the new Post-2020 Global Biodiversity Framework emerges. It will be fascinating to watch the quest to reach its goals unfold on the pages of INEA.

Footnote 1 (continued)

species and their control; Thematic assessment of the interlinkages among biodiversity, water, food, and health in the context of climate change; Thematic assessment of the underlying causes of biodiversity loss, determinants of transformative change and options for achieving the 2050 vision for biodiversity; Methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people; an IPBES Workshop Report on Biodiversity and Pandemics published in 2020 (IPBES 2020); and a workshop co-sponsored by IPBES and the Intergovernmental Panel on Climate Change held in December, 2020.

Appendix

Lessons learnt	Suggested conditions for effective and improved biodiversity governance	Potential reasons for governance failure	Sources
Implementation remains a central challenge, but challenge should not be conflated with ineffectiveness	Close interdependence of national and international regulation Active participation by diverse set of non-state actors Broad range of innovative techniques to ensure and control compliance Substantive domestic legal innovations	Insufficient resource capacities Policy incoherence across international and national level Disparate preferences of negotiators Institutionalized uncertainty (i.e., the outcomes of interactions between actors within institutions is largely unpredictable)	Birhanu (2010), Elvan et al. (2021), Groen (2019), Kalaba et al. (2014), Nijar (2013), Sand (2001) and Zainol et al. (2015)
Multilateral environmental agreements are vital for success	Multilateral environmental agreements can support national policy development Regional agreements and agreements between similar countries (in terms of their benefits and costs related to conservation) may contribute to more effective conservation There are some examples of successful bilateral agreements	Bilateral arrangements, including those between donor and recipient countries are generally insufficient Insufficiently resourced MEAs will be less effective	Alvarado-Quesada and Weikard (2017), Bezerra et al. (2018), Birhanu (2010), Groen (2019), Law and Kriwoken (2017), Lorenzo et al. (2018), Mbatu (2016), Rosendal and Andresen (2016) and Schulz et al. (2017)
Coordination and policy coherence are often lacking, insufficient, or superficial, but can be promoted	Overlapping membership and higher awareness of issues can enhance coherence in norms across international institutions Supporting national-level synergies, could enhance political will and promote state ownership over coordination and policy coherence	Inherent goal conflicts Negative policy interactions between interrelated issues Technical issues difficult to align Coordination and policy coherence not considered politically salient issues	Fernandez-Blanco et al. (2019), Haas et al. (2021), Kalaba et al. (2014), Moynihan and Magsig (2020), Rosendal (2001), Sand (2001) and Velazquez Gomar (2016), Young and Schram (2020)

Lessons learnt	Suggested conditions for effective and improved biodiversity governance	Potential reasons for governance failure	Sources
Institutional change and policy reform within existing institutions is incremental at best	Shifting international venue Combination of incremental reforms from within existing governance structures and transformative reform of institutional design Inter-organizational collaboration	Long history of international institutions, elements of institutional design, state preferences and geopolitical context can impede institutional change and policy reform	Axelrod (2017), Haas et al. (2021), Pentz and Klerk (2020), Rosendal (2001), Sand (2001), Stoett (2002) and Wilson (2008)
Understanding local political dynamics is critical	NGOs can contribute to compliance through naming and shaming Good knowledge of local dynamics is well worth the costs of obtaining	Lack of awareness of national political developments National vested interests	Axelrod (2017), Fernandez-Blanco et al. (2019), Filoche (2013), Kim (2019), Marsden (2018) and Rosendal (2001), Lim (2016), Guarino et al. (2017)
Equity concerns remain central but are not often addressed in biodiversity policy development at all levels	Buy-in of local communities is critical Post 2020 global biodiversity framework should incorporate a rights-based approach, shift from a focus on legality to legally empowering local forest producers	Benefit-sharing mechanisms often lead to elite capture, disempowerment of local communities, enhanced poverty, and dispossession of natural resources Legality movement tend to disadvantage IPLCs Institutional design aspects of the IPBES limits integration of indigenous and local knowledge	Atisa (2020), Challender et al. (2015), Coolsaet et al. (2020), Dunkley (2018), Ituarte-Lima et al. (2019), Koetz (2012), Nijar et al. (2017), Tladi, (2019) and Stoett (2002)
The role of non-state actors and private voluntary standards fluctuates	Multinational corporations should go beyond engaging in business-led coalitions and making public pledges to address deforestation	The array of non-legally binding and voluntary regulatory landscape in forestry has benefitted the private sector interests	Blanco et al. (2019), Fernandez- Weber (2018), Gulbrandsen (2005), Kim (2019), Pattberg (2005) and Sand (2001)

Lessons learnt	Suggested conditions for effective and improved biodiversity governance	Potential reasons for governance failure	Sources
Tensions over state sovereignty and collective action and the commons have often been visible but as often lurk in the shadows of environmental diplomacy and most ongoing discussions of global biodiversity governance	Governments should act as normative leaders in environmental diplomacy, making use of *windows of opportunity*	Tension between the concepts of "common heritage of [hu] mankind", and issues related to sovereignty, the presence of domestic economic interests and state capture, and patterns of privatization and enclosure Reluctance to change by some powerful states	Axelrod (2017), Humphries (2018), Pentz and Klerk (2020), Rosendal and Andresen (2016), Schulz et al. (2017) and Tladi (2019)

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