Lessons learnt from international environmental agreements for the Stockholm + 50 Conference: celebrating 20 Years of INEA

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Abbreviations
CBD  Convention on Biological Diversity
CDM  Clean Development Mechanisms
EU  European Union
FAO  Food and Agriculture Organization
G-20  Group of 20
G-77  Group of 77
GDP  Gross Domestic Product
INEA  International Environmental Agreements: Politics, Law and Economics
REDD  Reducing emissions from deforestation and forest degradation
SDGs  Sustainable Development Goals
UN  United Nations
UNEP  United Nations Environment Programme
WTO  World Trade Organization
US  United States of America

1 Introduction

1.1 INEA: coming of age

International Environmental Agreements: Politics, Law and Economics (INEA) was born in 2001 after a gestation period of two years where we debated on the need for an interdisciplinary international journal and the specific disciplines we wished to cover. We identified a niche in the journal market and focused on one aspect of governance—International Environmental Agreements—as this was a key interstate instrument to address global environmental challenges. We also wanted to bring together authors from all parts of the world. International Environmental Law was at the time just beginning to be recognized as a distinct field of study – but environmental issues were so complex that knowledge from economics and politics seemed indispensable for discussing international environmental
agreements. We were entering ‘terra incognita’ and the question was—could the system of making agreements between states actually address the complex environmental challenges (Sand & McGee, 2022).

We started with a bang, but the difficulty in getting registered for an Impact Factor led to a dip in submissions in the second half of the 2000s. However, once we received an Impact Factor, the number of manuscripts submitted rose substantially and we even had a period during which we had 6 issues a year with 10 papers each. We have now stabilized at 4 issues annually with 10 papers each with a relatively high rejection rate (70–81%). Our five-year impact factor is now 3.389, with downloads just over 220,000 in 2021. We have come a long way and decided to celebrate 20 years of INEA, as INEA has now come of age.

1.2 Environmental problems exceed the pace of interstate agreement based solutions

In 1972, the first world conference on the environment was held. It adopted a key declaration regarding the role of governments and other actors in relation to addressing environmental problems. It required that state sovereignty should be subject to not causing harm to other countries. Twenty years later, in 1992, the member states of the United Nations (UN) adopted the Rio Declaration on Environment and Development highlighting 27 principles that should guide state behaviour. This not only reiterated the concept of limited state sovereignty, but it also combined environmental principles with those relating to social and development issues. In 2015, the UN General Assembly adopted the 2030 Agenda which included 17 sustainable development goals (SDGs). The Agenda emphasized in its opening paragraph that: “We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development”. It stated that the 17 social, ecological and economic goals were interrelated and indivisible. In the meanwhile, several hundred bilateral through to global environmental agreements have been adopted. We are now on the brink of the Stockholm+50 Conference (June 2022). The question is: have the goals, principles and instruments adopted in international environmental agreements established a solid basis for cooperation between states that will enable the global community to address environmental problems in time to prevent the most irreversible impacts from setting in? Apart from the many challenges within the 2030 Agenda, a key problem is the reincarnation of the concept of ‘full permanent sovereignty’ which provides a route for countries to back-out from cooperation with others and not take full responsibility for harm caused to others (see Gupta & Schmeier, 2020).

Against this brief background, let us examine the state of the environment. Climate change and biodiversity loss have reached ‘emergency’ status. Species loss is increasing (Petersson & Stoett, 2022), the oceans are increasingly polluted, the land is highly degraded affecting the livelihoods of some 3.2 billion people, and air and water pollution cause some 9 million people to die prematurely each year, to say nothing about persistent ill-health. The COVID-19 pandemic has brought the world to its knees, and yet it has not unleashed the kind of global cooperation needed to solve the problems. The recent global assessments—Global Environment Assessment-6 (UNEP, 2019), its technical summary (Gupta et al., 2021), and the assessment of assessments entitled Making Peace with Nature (UNEP, 2021)—have highlighted that (inter)national policy processes lag far behind environmental degradation and that countries and other actors worldwide are not pulling their
Lessons learnt from international environmental agreements…

weight to solve these problems. In the meanwhile, such environmental degradation is responsible for at least a quarter of all death and morbidity, to say nothing about displacement and conflict, or the impacts of COVID-19. These impacts affect human well-being and social stability and will likely influence the ability of economies worldwide to continue to generate income.

1.3 This special issue: INEA 2001–2020

An INEA editorial in 2019 argued that global scientific assessments such as the Global Environment Assessment seek information on the lessons learnt from the way agreements are negotiated, designed (output), and implemented (outcome), and whether they actually achieve their goals (impact). However, scholars are often more focused on theory building, nuance in argumentation, and critical thinking, and therefore, are unable themselves to make an adequate contribution to the very problems they are studying. Hence, a key substantive question is—what has INEA contributed in terms of knowledge generated to the field of global environmental governance by focusing on international agreements? This is not only relevant as a reflection of how INEA has developed so far but also in light of the Stockholm +50 Conference in 2022.

Hence, this Special Issue on Lessons Learnt from International Environmental Agreements: Celebrating 20 Years of International Environmental Agreements (INEA) focuses on the key lessons learnt (including theoretical and methodological advances) in the more than 600 papers published between 2001 and 2020 and triangulated with references to other papers in other journals. Methodologically, we clustered the papers into different topics and invited editorial board members and authors who frequently publish in INEA to undertake the review. Authors have then adopted their own method of analyzing the papers.

This Special Issue has eight papers. Agni Kalfagianni and Oran Young have focused on the lessons learnt from a political science perspective, Peter Sand and Jeffrey McGee have drawn on lessons learnt from a legal perspective, while Nicky Pouw, Hans-Pieter Weikard and Richard Howarth have identified lessons learnt from the use of economic instruments in international treaties. Following this first cluster of papers, we have papers examining the fields of climate change (Philipp Pattberg, Cille Kaiser, Oscar Widerberg and Johannes Stripple), water (Naho Mirumachi and Margot Hurlbert), and biodiversity (Matilda Petersson and Peter Stoett). The final three papers focus on agency (Sylvia Karlsson-Vinkhuyzen, Katharina Rietig and Michelle Scobie), institutional interaction (Joshua Philipp Elsässer, Thomas Hickmann, Sikina Jinnah, Sebastian Oberthür, and Thijs Van de Graaf), and equity and justice (Joyeeta Gupta, Aarti Gupta and Courtney Vegelin). In this editorial, instead of going paper by paper, we have gone theme by theme in which we combine the lessons learnt across the papers. This reflects the reality that these issues are interlinked and demonstrates how different authors have dealt with the same issues but from their own disciplinary and/or epistemological perspectives. What emerges from all the papers is that the theme of ‘international environmental agreements’ requires not only knowledge from different disciplines, different levels of governance and actors, but also different specializations within themes. For example, unlike the normal distinction between national and international law, public and private law, INEA articles have covered challenges at the comparative national level, and discussed the challenges both public and private law provide for environmental issues, thereby addressing issues of scale and taking a wide spectrum of perspectives (Sand & McGee, 2022). Most papers focus on what we observe as happening in the different regimes; some focus explicitly on lessons learnt. This editorial focuses on
the lessons learnt from research on international environmental agreements, before drawing some broader conclusions.

2 Lessons learnt

We have clustered the lessons learnt into four categories—lessons from negotiations, treaty and agreement proliferation and fragmentation, lessons on agreement design (output), and lessons from implementation (outcome and impact).

2.1 Treaty and agreement negotiation and innovations

States as sovereign actors come together to negotiate solutions or agreements to their common problems. The reasons (drivers) why countries negotiate with each other are embedded at national and international levels and, hence, it is important to understand the role of these reasons at both levels. These reasons are linked to actors (e.g. their economic, environmental and political interests as well as their capacity) and to the context (e.g. the level of development, availability of technology, expectations of conflict or cooperation with other states), which are dynamically intertwined (Karlsson-Vinkhuyzen et al., 2022; Petersson & Stoett, 2022; Mirumachi & Hurlbert, 2022; Pouw et al., 2022). For example, the economic interests of the timber industry and fossil fuel industry have played a key role in shaping the framing of the Kyoto Protocol (Petersson & Stoett, 2022) and the Paris Agreement on Climate Change—the latter, for instance, does not even mention fossil fuels.

The role of the US is particularly important. While it needs international law to protect its multinationals, and its trade and investment interests, it tends to be a laggard in
entering international environmental agreements (e.g. the US has not signed the UN Convention on the Law of the Sea; the UN Convention on Biological Diversity; the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal; the Stockholm Convention on Persistent Organic Pollutants; and some related human rights agreements). On the one hand, it has access to massive knowledge because of its impressive scientific sector; on the other hand, domestic politics, the polarization between the positions of Democrats and Republicans, senate filibuster and two-third majority rules, and backlash against the UN, among other factors such as the unwillingness to change lifestyles, have influenced its role in international environmental agreements. Its tendency to use non-ratification and moving in and out of agreements (e.g. it never ratified the Kyoto Protocol to the Climate Change Convention and in regard to the Paris Agreement, the US accepted it by executive order, then withdrew, then once again re-joined) has left a mark on global treaty negotiations, undermining the success of this instrument. The EU plays a more consistent leadership role although it is less able to mobilize and influence other countries because of its own cumbersome internal politics. Nevertheless, there are examples where it has played the role of bridge builder (Petersson & Stoett, 2022). However, in relation to agreements on fisheries, neither the US nor the EU are willing to push for change as the current situation suits the interests of their fisheries (Petersson & Stoett, 2022).

Among the G77 and China, China has moved from being a cautious actor characterised by incoherence between domestic and international action, to show some degree of leadership ambition in environmental agreements. While least developed countries and small island states have made their case in many treaty negotiations, evolving from actor to agent, their influence on policy design has been limited (e.g. on loss and damage and reducing emissions from deforestation and forest degradation (REDD)). These developing country coalitions have, however, become unstable and this affects their agency both in relation to climate change and in relation to the work of the World Commission on Dams (Karlsson-Vinkhuyzen et al., 2022).

Non-state actors such as NGOs and businesses have been participating more often in international regimes. To some extent they provide new information and support for (or opposition to) governments and demand increased transparency. To some extent, they themselves can take action at the domestic level to influence national-level decision making (i.e. the two-level game theory) or work with governments and other stakeholders to implement policies and reforms at the national level. There is growing evidence that feedback loops between the domestic and international levels could enhance the effectiveness of action. This has been encouraged through the recognition of the UN special groups since 1992. Over the years, the views of youth and indigenous communities have been increasingly presented at the domestic level and acknowledged at international negotiations through greater procedural legitimacy and input legitimacy. However, these have had a limited influence on the outputs, often becoming part of a mere ticking-the-box exercise (Mirumachi & Hurlbert, 2022). NGOs and the business sector, on the other hand, have been more influential when they have sought to identify solutions to promote implementation. However, in the process, ideas such as market mechanisms have received greater inclusion in the agreements as compared to the ideas of youth and indigenous communities—this also affects the ability to implement these agreements (Karlsson-Vinkhuyzen et al., 2022). Where large multinationals are afraid to lose out from reputation damage, they may be susceptible to pressure from NGOs (Pouw et al., 2022); although this fear has not made a major dent on the large energy multinationals.
All this reflects the role of various forms of bargaining power which play a key role in shaping the outcomes of international negotiations. The water literature more explicitly talks in terms of hydro-hegemony—on how power influences the framing of water problems, water sharing and the instruments for managing water (Mirumachi & Hurlbert, 2022); the literature on climate change and the other regimes also discuss the influence of power in terms of the knowledge of the powerful scholars (Karlsson-Vinkhuyzen et al., 2022), powerful countries and powerful actors (Pattberg et al., 2022) in shaping agreements; while scholars do not talk of climate hegemony, they do talk of climate injustice (Pattberg et al., 2022; Gupta et al., 2022). When powerful states, actors and knowledge systems come together, it is easier to promote a neo-liberal story calling for a pragmatic as opposed to a principled approach, the use of more market mechanisms, reducing the role of the state in favour of other actors, reducing the role of joint action in favour of voluntary measures, and by promoting the views of the most powerful actors (domestic and international) at the cost of other knowledges (Karlsson-Vinkhuyzen et al., 2022). This has led to the rise of WTO disputes, e.g. on renewable energy subsidies (Van de Graaf & Van Asselt, 2017) and court cases around these various issues which focus on enhancing at least elements of the legal justice narrative and holding actors accountable (Karlsson-Vinkhuyzen et al., 2022; Moynihan & Magsig, 2020).

Such power often plays out within the changing North–South dynamics in international treaty negotiation (Petersson & Stoett, 2022; Gupta et al., 2022). Simply put, countries are in different stages of economic development. Within the UN, there has long been conflict between these countries in terms of whether the global North was trying to prevent the development of the global South through, e.g. trade, investment and other economic law instruments. This led to the adoption of the UN Declaration on the Right to Development in 1986. This did not entirely end the controversy—as there is conflict regarding whether this is a right of individuals or that of states. Nevertheless, in the environmental arena, first comers to development create an environmental problem, recognize the problem, and then make rules that may stand in the way of latecomers to development to use their own resources (e.g. deforest to make space for cities or agriculture; use fossil energy; water for hydroelectricity). In the Climate Change Convention, this right was reworded as the right to promote sustainable development, undermining its very meaning. Nevertheless, it has been included in the Paris Agreement and Agenda 2030, and this may lie at the heart of the call for ‘full permanent sovereignty’. In many ways, this principle has been exercised by the US in full with regard to global environmental treaties where it has refused to ratify these agreements as mentioned above.

Against the background of a range of domestic and international reasons for countries to participate in international treaties, it is important to recognize the procedural design innovations that have emerged over the years. These include: (a) encouraging meetings of the parties even before a treaty enters into force (e.g. the Intergovernmental Negotiating Committee meetings in the climate change regime); (b) designing a Convention with follow-up Protocols (now used in many environmental agreements enabling follow-up Protocols to get like-minded countries to move together); (c) setting standards in meetings of the Conference of the Parties which can be adopted by parties and do not need ratification—or what some refer to as the rise in global administrative law; (d) enabling consensus building around interpreting articles in an agreement after it has been designed to enable flexibility (Sand & McGee, 2022); and (e) breaking rigid coalitions by requiring developing and developed countries to share negotiation seats as was undertaken within the negotiations on the 2030 Agenda; (f) stocktaking of the science; and (g) enabling wide participation, including crowd sourcing (Chasek & Wagner, 2016). Treaty secretariats and chairs of
meetings are increasingly taking a leadership role in some of these innovations (Karlsson-Vinkhuyzen et al., 2022). Nevertheless, procedural efforts to enhance participation as a ticking-the-box exercise may undermine the legitimacy and equity of such processes. The securitization of some issues has also led to a suspension of procedural legitimacy in some regimes (Mirumachi & Hurlbert, 2022). Some of these measures go beyond what is generally acceptable in treaty negotiation but could be justified by the concept of limited territorial sovereignty. However, there is a healthy debate among legal scholars about whether and to what extent such observed innovations may affect the legal system.

A number of papers focus also on the rise of transnational actors and transnational governance systems as both try to address the limitations of interstate agreements as well as bypass the legitimacy and legality of this system. Such governance systems address these limitations by mobilizing many actors to take and demand action, by avoiding the deadlocks that often take place in the interstate system, and demonstrating the need felt by many actors to go ‘beyond the state’ (Pattberg et al., 2022; Karlsson-Vinkhuyzen et al., 2022). Having said that, many of these actions that aim at being efficient and effective, often end up sacrificing equity and justice issues, not least because they bypass the legitimacy and legality of the system (Pattberg et al., 2022; Sand & McGee, 2022).

2.2 Treaty proliferation, congestion and fragmentation

Whether it is due to the success of the treaty process, or due to the appeal of ‘treaty shopping’/forum shopping/forum shifting and avoiding a comprehensive agreement, the international arena is now congested with agreements from bilateral through to global levels, often addressing each issue individually (e.g. mercury), and using a set of inconsistent principles and instruments to address related problems. Those who wanted a number of bilateral and bottom-up approaches were afraid that global solutions and uniform approaches would not succeed (Pouw et al., 2022). However, these bottom-up approaches have also failed to meet quantitative targets, although they have mobilized other actors. Most of these agreements address the symptoms of the problems, with very few addressing the underlying challenges including the economic, trade and investment system and gross inequality (Petersson & Stoett, 2022; Gupta et al., 2022).

Such congestion in treaties is also referred to in many ways, including as treaty complexes (Kalfagianni & Young, 2022; Pattberg et al., 2022). The congestion and fragmentation in treaties lead to treaty fatigue, but also to greater coherence or contradiction between the agreements. For example, the Montreal Protocol on Ozone Depleting Substances allowed the emission of CFC substitutes that had a high greenhouse gas potential. While both the climate convention and the International Maritime Organization have looked at emissions from international shipping, they were unable to resolve their differences (Hackmann, 2012, cited by Elsässer et al., 2022).

Treaty fragmentation may be more economically costly because ambitious climate targets then have to be achieved by fewer actors or emission reductions cannot occur where they are cheapest (Hof et al. 2009: 58; Pattberg et al., 2022; Pouw et al., 2022). However, while effectiveness increases by increasing the size of the coalition, the larger the coalition, the more unstable and unwieldy it becomes (Pouw et al., 2022). At the same time, such treaty fragmentation often reflects normative conflicts between actors. The US initiated the Asia–Pacific Partnership on Clean Development and Climate (APP) in competition with the Kyoto Protocol and its requirement that the industrialized countries should reduce
their emissions. The APP eventually failed but also showed how such initiatives are often taken to undermine the legitimacy and equity aspects of existing regimes (Pattberg et al., 2022). Coordination between the climate regime and the forest regime failed as the climate regime focused on forests as carbon sinks and not on their role in biodiversity; while the forest and biodiversity regimes could reach coherence because of their mutually supporting definitions (Petersson & Stoett, 2022). Such fragmentation can exacerbate existing injustices (Okereke 2018; cited in Pattberg et al., 2022) by allowing forum shopping or shifting. Beyond such fragmentation within the environmental regimes, there is a growing conflict with the trade and investment regimes. Court cases on human rights reveal the clash between the human right to water and contract/investment law (Mirumachi & Hurlbert, 2022). Biodiversity regimes are also unable to cope with trade regimes: “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)” (Petersson & Stoett, 2022).

The interactions between these different regimes can reflect embeddedness (when one is embedded in another), nesting (when one is related to a broader regime); clustering (when one is clustered with another and coordinated); and overlap (when they cover similar issues). The causal interactions between these regimes can be cognitive-based (when the influence of knowledge, ideas and norms is discernible), commitment-based (when the commitments in one regime influence that in another—output level), behaviour-based (when the behaviours of actors in both regimes are influenced—outcome level); and impact-based (when actions in one regime influence the impacts in another) (Elsässer et al., 2022). Regimes learn from each other as, for example, with the ‘CBD-ification’ of older conservation agreements; notions developed within the CBD were then applied within other conservation agreements. This demonstrates cognitive learning. However, as biodiversity issues are less salient, the impacts they may have on other types of regimes may be marginal (Petersson & Stoett, 2022).

Innovation to address treaty congestion and fragmentation include: (a) treaty orchestration; (b) memoranda of understanding between treaties; (c) thematic clustering; (d) joint liaison groups; (e) coordination and integration through meta governance—e.g. through UN Water; (f) multi-stakeholder partnerships playing a ‘bridge’ role; and (g) initiatives by treaty secretariats (Sand & McGee, 2022; Pattberg et al., 2022; Petersson & Stoett, 2022). These are attempts at interplay management and have predominantly led to mutual learning, some efficiency improvements and increased coherence. Secretariats play a dominant role here, especially when “state preferences are weak and/or their expertise enjoys low substitutability” (Elsässer et al., 2022). Such innovations can be fruitful in that the interactions between the Paris Agreement on Climate Change, the Kigali Amendment to the Montreal Protocol on Ozone Depleting Substance and the Carbon Offsetting and Reduction Scheme for International Aviation have shown that “equal stringency reinforced cooperative fragmentation” (Pattberg et al., 2022).

### 2.3 Treaty design: goals, principles, rules and approaches

The toolkit of treaty design, as opposed to the negotiation and interpretation processes discussed above, has expanded from rules-based governance to include goals, principles and hybrid approaches. This enlarged toolkit offers more opportunities for addressing
global problems as one can tailor-make the tools to fit the situation (Kalfagianni & Young, 2022).

In terms of the nature of agreements, there is emphasis on both legally binding agreements, soft law, and something in between. While legally binding agreements reduce the risk of free riders, such agreements are often either harder to negotiate or include indeterminate language. Soft law agreements, being non-binding, provide greater scope for highlighting the needed changes and allow all actors including non-state actors to play a key role. A good example of this is the 2030 Agenda which appears to have mobilized a vast range of actors. The Paris Agreement is something in between—while being legally binding, the choice of ‘Agreement’ in the title and the lack of specific targets for countries within the document enabled the US to ratify, withdraw the ratification, and then again decide to ratify, without consulting the senate. This rise of soft law approaches and hybrid modalities is a key innovation in environmental agreements (Sand & McGee, 2022).

In terms of the content, most agreements have been relatively narrowly focused and rule-based. However, the Millennium Development Goals initiated some goal-based governance, but only included environmental issues based on limited indicators. The 2030 Agenda made more significant strides in goal-based governance which also aimed to create a comprehensive and systemic approach to addressing environmental issues (Kalfagianni & Young, 2022). This also led to delegating responsibility to states to come up with appropriate standards (Sand & McGee, 2022) and attention to interactions across domains.

While principles have been highly contested in different treaty regimes, the Rio Principles on Environment and Development provided a reasonably comprehensive soft law menu of values that could be incorporated by states. Water law has seen a profusion of principles being developed which include principles on not causing harm to others, equitable utilization and the recognition of the human rights to water and sanitation. Despite this impressive menu of principles, bargaining power/hydro-hegemony plays a key role in resisting the adoption, interpretation and implementation of many of these principles (Mirumachi and Hurlbert, this issue). For example, at times the polluter pays principle has been shelved in favour of cost-sharing principles as in the Rhine Chloride case (Mirumachi & Hurlbert, 2022).

Treaty design includes a range of collaborative instruments including targets and timetables, technology development and/or transfer, capacity building, financial assistance, and market-based mechanisms. Targets and timetables are a key feature of many treaties including those on climate, biodiversity and water. The design of such targets and timetables has been the subject of many papers. While ostensibly these targets aim at addressing the problem within a time schedule and allocating responsibility between states, power struggles have either led to such targets being poorly articulated (e.g. in the Climate Convention), or being left to bottom-up voluntary commitments (e.g. in the Paris Agreement) sacrificing equity concerns (Gupta et al., 2022). Many national and international agreements emphasize technology development and/or transfer. However, while such technologies can play a key role in enhancing efficiencies, the focus on using these technologies for augmenting supply (e.g. the supply of water or renewable energy), as opposed to reducing demand, may lead to technological lock-in that will be difficult to reverse as we reach planetary boundaries (Mirumachi & Hurlbert, 2022). This insight may also be relevant for capacity-building efforts. Moreover, the unwillingness of states to promote less dependence on fossil fuels has also led to risky technologies being promoted such as geo-engineering and negative emissions technologies, often also justified by arguments that this addresses equity concerns (Pattberg et al., 2022).
Financial aid to countries with economies in transition and developing countries has often been seen as a way to enhance treaty implementation. The provision of such assistance has been shown to be effective in public goods provision, given the difference in costs with low-cost countries (Pouw et al., 2022). Moreover, financial assistance through the Global Environment Facility (GEF) has been effective in creating awareness on climate change and biodiversity (Pouw et al., 2022), but whether the GEF projects in themselves have been effective has not been systematically analysed. Much of the literature also discusses that technology transfer and financial assistance have scarcely been in line with what has been promised in the agreements. For example, the Paris Agreement promise to raise USD 100 billion from 2020 onwards to help finance the climate actions of developing countries is a broken promise, as an article in Nature reveals.1

Instead, there has been considerable focus on market-based mechanisms, especially since the 1990s. This has been most prominent in the climate change regime with its focus on joint implementation, the clean development mechanism (CDM), emissions trading and reducing emissions from deforestation, and forest degradation (REDD). Many of these instruments looked good on paper, but as Kalfagianni & Young (2022) note, the second best instruments may often have a better result. This may be because, in the development of such instruments, the key actors concerned may be inadequately heard: for example, in the REDD instrument—the voices of the powerful industry and economic actors drowned those of the indigenous people and local communities who have long been protecting these resources, to the detriment of a successfully designed instrument (Karlsson-Vinkhuyzen et al., 2022). REDD, in addition, has many design flaws (e.g. the potential for leakage, unproven additionality; perverse incentives, etc.). Similarly, while the CDM did take off because of the cost-effectiveness it embodied (Pouw et al., 2022), it was facilitated by a wide range of stakeholder networks and was relatively efficient as a project-based instrument (Karlsson-Vinkhuyzen et al., 2022), neither the CDM nor emissions trading nor joint implementation mobilized the necessary changes and instead postponed the need for action in the industrialized countries. Within the EU, the internal trading system was initially weak because of the low emission caps, but since 2013, it has been more stable in reducing the rate of growth of emissions (Pouw et al., 2022). Nevertheless, this does not mean that this will work in other national contexts or at the global level.

Many agreements promote public–private partnerships. While these ostensibly optimize the strengths of both public and private actors, they can also have serious challenges that have been highlighted in the broader literature. INEA has highlighted that the success of such partnerships depends on how the contract has been designed, whether there is a functioning legal system, the relationship with contract and investment law, and often aid or government funding (Miumachi & Hurlbert, 2022). Such agreements run the risk of lack of affordability for the poor and, hence, low-cost recovery by the companies (Pouw et al., 2022) as well as poor financing of wastewater systems. The rise of re-municipalization of water services in many Western countries reveals the shortcoming of using this instrument, especially in relation to public goods.

Governments can phase out perverse subsidies or promote subsidies to change behaviour. A special issue examined the key elements of success and failure in regards to energy subsidies at the intersection of climate, energy and trade governance. Overall, it concluded that a consensus definition of “energy subsidy” is missing, methods for measurement

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1 https://www.nature.com/articles/d41586-021-02846-3
Lessons learnt from international environmental agreements…

usually take a price-gap or inventory approach, and that renewable energy support is continuously challenged (Van de Graaf & Van Asselt, 2017, 321). Proposals for reform (e.g. by the G20) call for action by those who usually establish energy subsidies, i.e. national or sub-national governments, but increasingly also by other actors in the “regime complex” (p. 324). While the G20, the World Trade Organization (WTO), and the Climate Change regime can play an important role in signalling energy subsidy reform needs, steering away from financial investments from fossil fuels, and prohibiting the most environmentally harmful fossil fuel subsidies (De Bièvre et al., 2017), other international government organizations can play an accompanying role in implementation. Kalimo et al. (2017) proposed a less important role for the WTO adjudication process in deciding about value reconciliation, arguing that member states themselves should develop rules and regulations to balance economic and environmental values under the WTO Agreement on Subsidies and Countervailing Measures.

Agreements also need to embody elements that ensure adaptability to new circumstances. Adaptive treaties are critical for addressing the uncertainty in complex environmental problems (Kalfagianni & Young, 2022; Mirumachi & Hurlbert, 2022). In fact, many (e.g. water) treaties will have to be renegotiated in order to address the impacts of climate change on these treaties (Mirumachi & Hurlbert, 2022). Policy mixes need to ensure that the sum total of the different instruments address the various dimensions of the problem (Mirumachi & Hurlbert, 2022).

A key question in treaty design is how just and equitable are these agreements. While in the early 2000s justice issues were scarcely covered or subsumed under a behavioural approach within new institutionalist scholarship within INEA, they were later covered under access and allocation issues; and since 2015 there is a more open discussion on justice issues. While equity principles have been a cornerstone of international law, parties have selectively adopted these principles in agreements and also selectively implemented them. For example, despite the adoption of the common but differentiated responsibilities and respective capabilities principle, there has been a shift from top-down to bottom-up voluntary targets in the climate regime in a post-equity approach (Pattberg et al., 2022; Gupta et al. 2022). In the world of bilateral and transboundary water agreements, agreements have often excluded the equity issue of local actors which may exacerbate impacts on the environment as well as on local people; permits given to big actors may exclude small ones but may not prevent them from using the water they need, and papers argue that equity issues need to be accounted for in the ways water problems are to be addressed (Mirumachi & Hurlbert, 2022). What becomes evident is that although justice norms should enable a critique or reinterpretation of text, in practice procedural justice is relatively easier to achieve (although it may become a ticking-the-box exercise) than substantive justice in issues such as climate change. Three discourses appear to be emerging—corrective justice, justice issues in the energy transition, and justice in relation to adaptation. They show that market mechanisms may have an impact on justice and such mechanisms are not spontaneous but have been created. Papers also argue that one may need to go beyond holding some states responsible to holding key actors responsible for their emissions (Sand & McGee, 2022; Gupta et al., 2022).

Some papers have discussed the conflict between efficiency, effectiveness and equity/justice. While some suggest that efficiency and equity can be enhanced through global market mechanisms, others have argued against it. There has also been debate about whether environmental agreements should address prioritizing environmental issues over equity (e.g. Verbruggen cited in Pouw et al., 2022; Vellinga et al., and Keohane cited in Pattberg et al., 2022) or not. The adoption of the 2030 Agenda recognizes the indivisibility of goals.
and that neither should be prioritized over the other. The mood in scholarship has also changed worldwide as evinced by debates in other journals (e.g. *Global Environmental Change, Third World Quarterly*). The rise in youth and social movements and court cases also demonstrate the growing demand for justice (Pattberg et al., 2022; Gupta et al., 2022). Some see the idea that effectiveness can be achieved without equity as wishful thinking. Achieving environmental goals without equitable approaches is unlikely; achieving access without fair allocation is also likely to fail. This is because environmental treaties need to address the underlying drivers of environmental problems, and not just the symptoms (Pattberg et al., 2022; Gupta et al., 2022).

### 2.4 Treaty implementation: vertical interaction

Lessons learnt on treaty implementation show that treaties may succeed if one assesses implementation in terms of mobilizing actors and coalitions, political parties, public opinion, sub-national entities, media coverage and initiatives and the engagement of bottom-up actors who then may mobilize their transnational partners (Pattberg et al., 2022; Karlsson-Vinkhuyzen et al., 2022). Justice and equity issues in biodiversity regimes have been difficult to implement: benefit-sharing mechanisms have been poorly implemented, subject to elite capture and disempowerment of local people (Petersson & Stoett, 2022). This has also been the case in the climate change regime where technology transfer and finance has been low, while in target setting and implementation equity issues have been sacrificed (Pattberg et al., 2022; Gupta et al., 2022). Empirical measurement of treaty implementation tends to be dismal in showing the actual achievement of the end goals of a treaty and breaking the negative trends (Pattberg et al., 2022). None of the Biodiversity targets for 2020 were achieved; nor was access and benefit-sharing as designed in the agreement achieved (Petersson & Stoett, 2022). Most studies focus on hypothetical results—what would happen if the goals are achieved; but few actually trace the specific implementation of treaty measures. Institutionalized uncertainty affects treaty implementation (Petersson & Stoett, 2022). Clearly, national and sub-national dynamics play a key role in influencing treaty implementation (Karlsson-Vinkhuyzen et al., 2022). Such mobilization and dynamics should ultimately influence states to commit to action under international law. In fact, if the implementation is viewed as having output legitimacy this can provide positive reinforcement by ensuring that social actors agree to participate in the process (Karlsson-Vinkhuyzen et al., 2022). Costs and perceptions of costs play a role in influencing implementation. The fall in the costs of renewable energy has made it more attractive to implement. The availability of zero-carbon technologies and finance also increases the likelihood of action. At the same time, the high costs and other barriers of technologies including trade barriers and intellectual property rights also influence the willingness to act (Karlsson-Vinkhuyzen et al., 2022). In terms of reporting on implementation, industrialized countries are less likely to mention the actions and initiatives of non-state and sub-national actors than developing countries. Thus implementation may be difficult, but may still meet some criteria of effectiveness (Petersson & Stoett, 2022). Compliance mechanisms differ from regime to regime, but in general, are able to mobilize action but not always ensure implementation. Some innovations here include the EU issuing a warning to South Korea on non-compliance with fisheries law, which was more effective than listing its vessels as Illegal, Unregulated and Unreported fishing vessels under the Convention on the Conservation of Antarctic Marine Living Resources, which is relatively less known and has less impact (Petersson & Stoett, 2022).
The challenge is the lack of data and lack of resources to conduct quality comparative research on what policy mixes work, where and under what circumstances.

3 Conclusions

3.1 International environmental agreements are necessary

Despite the rise of transnational governance and multiple polycentric approaches, there is growing evidence that international environmental agreements between states are an essential tool for addressing transboundary to global environmental challenges, especially as we reach and/or cross planetary boundaries. They 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” (Petersson & Stoett, 2022). There are many examples of how such agreements have shaped national policy and mobilized local people worldwide (Sand & McGee, 2022). However, the policy process is moving too incrementally in relation to the speed of environmental degradation (Petersson & Stoett, 2022) and past approaches cannot solve or even pre-empt future problems (Elsässer et al., 2022). Such agreements have to ensure that sovereignty is subject to responsibility to others (Petersson & Stoett, 2022) but the shadow of full permanent sovereignty within the 2030 Agenda and US behaviour in walking in and out of agreements falls over such cooperation (Gupta et al., 2022). The role of the large emerging economies is also uncertain given their institutional challenges. At the same time, intergovernmental environmental agreements need to better collaborate with other public and private agreements and initiatives covering a wide range of policy domains in order to become effective (Elsässer et al., 2022). They need to be able to develop a range of instruments and incentives, including orchestration practices to mobilize other actors to take action. Treaty secretariats can increasingly play a role in this.

3.2 Multiple frames of problems are necessary, but it is critical to recognize the non-excludable but rivalrous nature of many problems

Multiple frames exist to describe environmental problems. Commoditying nature within market mechanisms, trade and investment regimes or securitizing nature re-configures its role and may thus undermine the very goal of environmental protection as nature loses its meaning (Mirumachi & Hurlbert, 2022). Recognizing the multiple frames and the particular way they dispossess nature from the environment may be a first step towards addressing the problems that different regimes make invisible. Treaties must not just represent the views of the most powerful actors, but also those of the most vulnerable—they need to acquire a human face. Taking concrete steps toward enhancing procedural and input legitimacy among a broader range of actors in international environmental agreements such as indigenous organizations is essential (Mirumachi & Hurlbert, 2022). Moreover, addressing environmental challenges as non-excludable but rivalrous may be critical for problem-solving (Mirumachi & Hurlbert, 2022). Both these points speak to the earlier mention of the slow emergence of more flexibility and design innovation of environmental agreements over the years and, if the specific characteristic of non-excludable but rivalrous challenges in different contexts are taken into account, and if the range of actors are expanded to include those relevant to the environmental problem, then better outcomes can be expected.
3.3 Economic interests tend to trump environmental interests and justice concerns

Many papers show how the economic interests of the most powerful dominate the landscape of environmental agreements. Social and ecological interests are marginalized. Poverty and inequality are reaching high proportions and ecological destruction trends are not being reversed—they appear as afterthoughts instead of leading concerns. Ironically, those who cause the problems are not necessarily those in the front line of action and this has meant that the motivation of the rich and powerful states and other actors to address the root causes of ecological destruction is low. However, it is the poor and marginalized who will be most affected. Their poverty and marginalization are itself not innate, but caused by governance systems. All this makes sustainable development possibly problematic as it tries to balance economic with social and ecological issues, but only economic issues are measured in actual money! Studies show that protecting ecosystems is expensive in the context of the Water Framework Directive and may cause a dent in GDP even in developed countries and that without external finance, measures may not be taken (Pouw et al., 2022).

3.4 Environmental and social justice concerns call for a new economic paradigm

Thirty years of environmental agreements which have failed to reverse the trend of global environmental degradation reveal that the drivers of such degradation lie outside the environmental realm – mostly in the economic realm and in the pursuit of GDP (cf. UNEP, 2019, 2021). As long as economic goals dominate, more and more ecological resources will be commodified and traded in markets. This conversion of global (semi) public goods into private goods is a key cause of environmental degradation. At the same time, it results in land and water ‘grabbing’, dumping of electronic and plastic and other toxic wastes on the global South, and externalizing the negative impacts of development on the poor and vulnerable. A focus on efficiency and effectiveness will not be able to address the vested interests (Mirumachi & Hurlbert, 2022). The rise of social and environmental justice movements including youth movements, and their increasing use of courts to secure environmental justice is a sign that justice issues are being brought more formally and professionally to the agenda. The need for justice is also clear: excluding the developing countries (about three-quarters of the global countries) or the poor (about half the world population) will not address the ecological challenges of the rich. There are growing numbers of papers which, therefore, emphasise the need to take justice concerns on to the table in order to be able to address environmental ones, modifying the earlier positions of scholars that environmental agreements should not aim to also address social justice issues. This is also recognized by the 2030 Agenda which sees the different goals as indivisible.

Even though procedural justice is easier to accept than substantive distributive justice issues by states, ‘thin’ market justice in combination with bottom-up voluntary targets is unlikely to address the major challenges before us. Without distributive justice, it may be impossible to live within planetary boundaries. While the 2030 Agenda has prioritized issues of access, such access without a wider discussion of how resources are allocated will not work. As resources are scarce, the price of these resources keeps going up, making them unaffordable for the poor and making cost recovery in delivering such resources/services to the poor impossible, undermining the ability of market-based mechanisms and public–private partnerships or even states to subsidise these resources endlessly. In the final analysis, countries and other actors will have to revisit the content of development in order to ensure that we live within our environmental means. Environmental goods
are non-excludable—which means that even if richer countries continue to marginalize the poor and poor countries, the latter cannot be excluded from using and polluting their resources, something they have tried to ensure through their call for full permanent sovereignty. We are all in this boat together: only united can we move forward (Stoett et al., this issue; Pattberg et al., 2022; Gupta et al., 2022; Mirumachi & Hurlbert et al., 2022). All this means that we have to question our current economic paradigms.

In terms of an overarching research message, in collecting and assessing papers on which measures work and which do not in specific contexts, it becomes apparent that there is a wealth of case studies but few systematic comparative analyses. This may be because social science research funding is geared towards innovative knowledge, innovative conceptual frameworks and theory building as opposed to the generation of solid evidence that may be less innovative, builds on standard conceptual frameworks and attempts to systematically assess whether, e.g. market instruments or standards have worked to achieve their goals and what they have externalized. A key message is thus the need for significantly more research on analysing the equity, effectiveness, efficiency, and political feasibility of policy instruments through consensus building.

3.5 INEA: the canary in the mine

INEA has played the role of the canary in the mine, signalling key problems to the broader governance community, especially with respect to the negotiation of international environmental agreements (Sand & McGee, 2022). While this first phase has focused more on theorizing and developing methods for analysing, in the future INEA should not just signal problems early, but should also more proactively develop science-based recommendations for better policy design to address problems effectively, efficiently and equitably.

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