Climate Governance Commission

Towards a Global Environment Agency Effective Governance for Shared Ecological Risks

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Executive Summary

The increasingly grave set of global environmental problems are interrelated and also entwined with economic and social issues in a complex, dynamic system. A brief analysis of the present challenging state of the planet from a systems perspective, including its root causes, shows: natural systems as complex global public goods; currently insufficient global governance founded on a too-narrow conception of national sovereignty where international laws cannot be enforced; and an unregulated and unbalanced global economy, plagued by widespread corruption and presumptions of wasteful or unlimited natural resource use. Resource exploitation and environmental degradation have reached, if not exceeded, planetary boundaries and the current system of global governance is in no position to respond adequately.

A review of the many global environmental governance institutions, multilateral environmental agreements and reform proposals provides the basis for our proposals to move towards effective governance of the challenges facing the world today. This paper argues that a way to tackle the crises could be a system of polycentric governance with responsibilities allocated across governance levels (from local to global) based on the principle of subsidiarity – with a global level institution – a Global Environment Agency (GEA) or equivalent – that has binding, supranational authority in certain essential areas.

Functions

We identify five central functions that are suggested to be incorporated into a Global Environment Agency – or a similar effective governance process or institution at the global level:

The knowledge provision function would enable the Global Environment Agency to generate knowledge through monitoring and research, collect and assess available knowledge for risk identification and assessment, disseminate knowledge with modern information technologies, make knowledge accessible to decision-makers, and provide evidence-based advice through appropriate science-policy interfaces.

The deliberative and legislative function corresponds to the role a parliament has at the national level to adopt necessary legislation, supported by deliberation on values and priorities among its members and in the public domain and media. Such deliberation should be inclusive and in the form of authentic dialogue responsive to the needs of all those affected, as well as effective through the introduction of some form of majority voting for the most essential issues.

The enabling and implementing function should be strong enough, in terms of mandate and financial resources, so that it can adequately support countries to strengthen the implementation of international environmental laws and orchestrate the work of the many other international institutions on cross-cutting issues.

The trust and justice building function deals with accountability, mediation and dispute settlement, with the ultimate purpose to create trust and build justice among states and with humanity at large. States need frameworks in which they can trust each other to collaborate and create stronger international laws and organisational functions.

The learning and reflexivity function is a cross cutting function, needed to address the complexity and uncertainty of the future. A viable global environmental governance system needs the ability to reflect on and reconfigure itself to improve its performance, learning from environmental changes and past experience, and adapting to the same.

Establishing a Global Environment Agency

The creation of a Global Environment Agency could build on the United Nations Environment Programme (UNEP), but would involve neither simple reform within its present mandate nor upgrading it to a specialised agency. The role of such an Agency would be more than a simple catalytic or coordination function, but could rather establish a central authority gradually acquiring the mandate to take decisions based on majority voting for the tasks that lower levels of governance (e.g., at the national level) are not able or willing to perform, in line with the principle of subsidiarity. The Agency is proposed to have the authority to adopt the global rules, norms and values to ensure the safeguarding of the planetary environment for the common good, as well as the right to a clean, safe, productive human environment, and should be endowed with adequate supervision authority to ensure necessary rules are followed.

The GEA's position within the UN system will depend on whether there are wider UN reforms giving, for example, legislative authority to the General Assembly or binding judicial capacity to the International Court of Justice. In their absence, granting such authority more narrowly to the GEA to act on the planetary environmental crises may be more politically acceptable. Within a reformed UN, the GEA could be one of several policy-setting and implementing agencies.

There can be both a long-term strategy and some short-term steps forward towards building this global institution. We make a set of specific, near-term proposals to strengthen global climate governance to, for example, adopt rules of procedure for the UNFCCC to enable majority decision-making; set up an independent global scientific advisory council to support country reflections on their ethical responsibility and highest possible ambition; and support actors to use existing accountability mechanisms (courts, parliaments, audit agencies) for states' climate obligations.

Such measures could serve as a first pilot strategy for breaking new global governance ground, due to the urgency of the climate challenge and the need for rapid action. It is an issue with widespread support from states and the broader public with a relatively strong legal foundation in the Paris Agreement. However, while climate change is perhaps the most pressing global environmental crisis, climate governance needs to overlap with many other problems and ultimately, they could be tackled together by a Global Environment Agency evolving out of UNEP.

1. Introduction

This report provides a rationale for the creation of a Global Environment Agency (GEA) or equivalent institution and describes the functions it would need to perform, in order to protect the Earth's vital ecological processes. Technological advances have so increased our environmental impacts that the uncontrolled actions of a minority of states, or even of corporate actors beyond sufficient governmental control, are threatening the future of civilization. As climate change illustrates, it is urgent to address these existential threats. In this paper, we argue that an effective and legitimate Global Environment Agency or equivalent body is needed with the capacities necessary to regulate planetary human impacts and to restore the essential natural equilibrium of the biosphere. We illustrate the role such an Agency could play to protect us from the existential risks of runaway climate change caused by human emissions of greenhouse gases. We also assess past and current efforts to establish and reform institutions for global environmental governance as the basis for a set of concrete suggestions for the institutional criteria for a GEA, and, finally, we propose ways forward in institution-building.

There is extensive literature on global environmental governance, both academic and in various governance and policy processes. For this report, we chose to focus on reviewing the academic literature, as scholars should be more objective in analysing the reasons for current governance deficits, and less constrained by what may or may not be politically acceptable. We specifically reviewed three sets of literature: analyses of the functions of governance and particularly of complex issues; rationales and principles for allocating governance to specific levels; and analyses of the status and challenges in global environmental governance, especially those providing proposals for reform.[1]

This report focuses on the global public governance aspect of global environmental governance, where states are the main decision-makers in the institutions (institutions referring to both rules and norms as well as organizations). Other actors may also be important in global governance, but public actors simply have the largest responsibility, in our view, at the global level as at the national level. It is increasingly apparent that all the environmental problems are interrelated and also entwined with economic and social issues in a complex, dynamic system, so the many attempts to govern specific problems have always fallen short. While climate change has emerged as perhaps the most pressing global environmental crisis, and will receive special attention in this report, climate governance needs to overlap with many other environmental problems and ultimately, they have to be tackled together.

The main objective of our report is to propose what an effective and legitimate Global Environment Agency could look like. We do this in the following steps.

First, we start reasoning from the ideal, both by identifying the most helpful (effective and legitimate) principles for rationalising the allocation of governance between levels (**section 2**), and by defining the functions that need to be incorporated into any effective governance process or institution at the global level based on the academic literature (**section 3**). We identified five such functions: providing knowledge, deliberating and taking (legislative) decisions, enabling or implementing action, building trust and justice, and a cross-cutting function of learning from experience and reflexivity. When identifying these ideal principles and functions, we also provide a brief analysis of the current status of their provision. This becomes the first basis for identifying reform proposals in **section 5**.

Second, we review past and present global environmental governance institutions, and particularly efforts at their reform (**section 4**). This review, and espe-

cially the concrete reform proposals, provides the second basis for identifying the best models for designing a Global Environment Agency, able to address global environmental risks. Obviously, the global framework that we propose will have significant implications for what governance is needed at lower levels, but this is not considered here.

In a third step, in **section 5**, we formulate concrete proposals for the core elements that a GEA should incorporate to provide its necessary functions to deliver effectively on global environmental governance. In the fourth and final step in **section 6**, we consider our proposals in relation to the current institutional and political context and identify possible ways forward. We do so particularly for climate change governance, as we suggest this may be a plausible pilot issue to advance global environmental governance due to its urgency.

But first, to set the stage, we provide a brief analysis of the present challenging state of the planet and its root causes in some present characteristics of human society, as well as the inadequacy of present efforts at global environmental governance to address these.

The dismal state of the planet

The planetary environment upon which all life depends is a single biospheric system, now under great human pressure from climate change, the biodiversity decline, overexploitation of land, oceans and natural resources, and many forms of pollution. Despite a half-century of international collaboration on the issues and a few victories, such as for ozone-depleting substances, the negative trends continue downward. Climate change is accelerating faster than science has predicted, a sixth mass species extinction is underway, and the products of material civilization now outweigh all the biomass on the planet.[2] Behind these problems is a fundamental deficit in environmental governance at the global level, in addition to deficits at particularly the national level in most countries.

To understand this collective failure of humanity to care for its common home, it is necessary to explore its root causes as far as we understand them. Some can be addressed within the framework of global environmental governance institutions as addressed in this report, while others are much deeper and require more general improvements to governance for social, political and economic transformations at all levels.

If we stand back and take a broad systems perspective on governance in the present world, we see that it has globalized technologically and economically, while resisting social globalization and clinging to institutional forms and world views dating from previous centuries. Most fundamentally in an evolutionary perspective, it is possible to argue that civilization advances with higher levels of integration based on principles like justice, equity, unity in diversity, human dignity, altruism, and empowerment (Huddleston 1989). In the absence of such principles, ego, pride, and competition for power, wealth and fame become driving forces that lead to excessive inequity within and across countries, extremes of wealth and poverty, polarisation in societies, exploitation, despotism, war, genocide and other crimes against humanity and the planet.[3] The dire state of suffering and degradation that is prevalent in many places tends to hide the countless efforts of individuals and groups to build a better, more just and sustainable world. Many people do not see human beings as able to rise above self-centredness towards altruism, solidarity and cooperation, while there is strong evidence to show they can (Monroe 1996). Attempts to change this negative dynamic and to enable individuals, and especially leaders, to rise to their human potential of acting for social good meet resistance from vested interests in the status quo. The result has

been failures in the relationships and trust required for effective cooperation and reciprocity, the foundations of governance.

The following paragraphs briefly review some root causes of our current problems as an aid to addressing them. A more detailed exploration of these challenges can be found in **Appendix 2**, Root Causes of Failures in Environmental Governance.

The natural systems in the atmosphere, oceans, biosphere and chemical cycles that maintain the global environment are largely **global public goods.** They make up the global commons, provide global services, and cannot be owned or privatized. When they are maintained, everyone benefits, and if damaged, everyone suffers, so free-riding is easy. Public goods require particular governance approaches and usually require strong involvement by the state at the national level, and this is similarly the case at the global level. A strong and sincere commitment to universal cooperation is needed in various forms depending on the nature of the good.

The present system of global governance is founded on the principle of **national sovereignty**, where each country is free from any outside interference in its internal affairs and can ignore what might be in the global common interest. Yet, such sovereignty is severely eroded by processes of globalisation, and often serves today to shield autocrats, kleptocrats and even failed states from any global accountability, or adherence to common international standards. The general use of the consensus rule in UN institutions to protect sovereignty has forced decisions to the lowest common denominator. States have also been unwilling to share their governance prerogatives with the rising willingness and ability to engage of non-state actors and civil society. What is needed is a global system to protect the **national autonomy** that is essential to respond to the many different environmental contexts and cultural expressions on a planet with great diversity (Lopez-Claros, Dahl, and Groff 2020) (see discussion on allocation principles in **section 2 below**).

The United Nations has been plagued by the split and stand-off between **North** and **South**, developed and developing countries, rich and poor, at least as defined in material or economic terms. The Western economic system too often replaced colonization by newer forms of economic exploitation, both in North and South. As the wealthy countries raised environmental issues, the poorer countries feared for their equitable development priorities, and frequent failures to respect commitments led to an erosion of trust, with political will lacking to make collective efforts for the global good (Najam 2005).

The existing framework of the global, largely unregulated **market economy** has also been a root cause of ineffective environmental governance, with market failures, priority to those willing and able to pay, resource use based on the rate of return and access to credit rather than the rate of resource replenishment, and economic accounting based on property relations that assume perfect substitution and even a right to harmful use, while ignoring public goods (Anderson 2012).

Additionally, widespread **corruption** and criminal behaviour often undermine effective governance, subverting the rule of law and the respect of international obligations, and extracting a major part of the finance normally directed to beneficial ends (López Claros 2015).

Inadequate governance at the global level

International environmental governance has developed over the last half-century at a time when economic and social issues have dominated public discourse, with environment a struggling late-comer. As the concept of sustainable development emerged in the late 1980s with three pillars - economic, social and envi-

ronmental - the latter is seen as the weakest. The Bretton Woods Institutions have been kept on the fringes of the UN System, and the World Trade Organization (WTO) entirely outside it, to preserve the dominance of the major economic powers. Oberthür (2005) has highlighted the challenges in the international system including reliance on the consensus rule and the lowest common denominator, ineffective implementation from a lack of carrots and sticks, and inter-institutional conflicts and inconsistencies such as between Multilateral Environmental Agreements (MEAs) and the WTO, creating a system not amenable to institutional changes.

One challenge that has emerged over the years, as described by Chambers (2005), is the shift from environmental to sustainable development governance. As the debate on environment versus development has evolved since 1972, the challenges of coordinating in the UN system, with many semi-autonomous agencies with their own governing bodies, have become more difficult. The United Nations Environment Programme (UNEP) established in 1972 was not mandated to implement country projects to avoid competing with them. What was in fact needed, to tackle meaningfully the set of interdependent governance issues, was not coordination but consolidation of agencies. However, more ambitious proposals for UNEP's mandate would have been politically impossible. It was even suggested at the time to give responsibility for governance of the environment to the United Nations Development Programme (UNDP). With attention shifting to sustainable development, the Commission on Sustainable Development (CSD) that was created to follow up on the outcomes of the 1992 UN Conference on Environment and Development (UNCED), such as Agenda 21, overlapped with UNEP's mandate, with no clear division of responsibility, and UNEP was unclear of its role in Agenda 21. The environment stayed under-resourced and on the margins. UN Secretary-General Kofi Annan, in Renewing the United Nations (UN Secretary-General 1997), written by Maurice Strong, emphasized the need for a more integrated and systemic approach. Despite proposals by governments in the process leading to the World Summit on Sustainable Development (WSSD) in 2002, the push to upgrade UNEP to a specialized agency was blocked at the conference. While the institutional landscape has become increasingly complex with a need for a closer network among MEAs, there had been little progress in consolidation and coordination at the time of Chambers' review (2005), and only minor advances since.

Desai (2014) argues convincingly that the future of reforming global environmental governance depends on states' political will, that is "how far they wish to go in the process, how much they want to translate their international environmental commitments into action, and how willing they allow transparency in the functioning of different institutional structures" (Desai 2014, p. 273). We can conclude that an international system privileging a narrow view of national sovereignty, with hundreds of MEAs and many institutions with some role in international environmental governance, has overwhelmed government capacities and proven inadequate to manage the problems at the scale necessary. There is a general failure in implementation.

Kütting (2014) has provided a useful overview of global environmental governance and its failure to be effective in coordinating ecological policy or correcting environmental problems over the last 20 years. Her analysis, summarized in the following paragraphs, considers the political and ideological underpinnings of the major policy and reform proposals reviewed in **section 4** below and provides a useful framework to consider some of the issues that must be overcome if an effective global environment agency is to be created.

Kütting notes that international cooperation to regulate transboundary and global problems confronts a system of international anarchy, given current paradigms of national sovereignty. Furthermore, she argues that the evolving new

global environmental politics was grounded in neoliberal thought, and that the later global governance discourse was not centred on policies to manage environmental problems competently, but rather perpetuated dominant economic structures and practices. The efforts to expand global governance to include global civil society, she also argues, led to increased privatization of environmental governance, and did not consider the unequal power relations between the different actors that characterize the global political economy. Kütting does recognize that more recent governance frameworks are more representative and successful politically but this does not mean that they are effective in ecological terms.

Kütting underlines the failure to consider society and how individuals behave both politically and economically, emphasizing the need for **justice** so that the rights of communities are respected at the local, regional, national and global levels, and incorporating legitimacy, inclusiveness and equity, both within and across societies. She argues that in the case of climate change, as an example, the focus on governance institutions, policies, actors, networks, consumption, equity and economic tensions has not resulted in more effective policy solutions to climate change (Kütting 2014, pp. 230-231).

Kütting further maintains that the challenges for global environmental governance originate in the making of institutions based on political compromises between economic needs and environmental needs which in most cases are not effective for the environment. She expects that institutions that are more equitable would enable the sharing of both environmental and financial burdens, but this may still not make the environment better off. Nature, or the environment, has to be represented, but nature cannot represent itself, requiring interested parties that represent nature. Kütting asks what form of political organization is the most appropriate for combining equity and sustainable environment–society relations? She notes the incompatibility between a complex planetary ecosystem and an economic system based on accumulation of wealth and economic efficiency aiming for unlimited growth, and that adopting proposals to improve global environmental governance needs political will. However, generating such will is not something that can be expected, she argues, the reason being "that actors operate within systemic constraints and that these constraints cannot easily be overcome even in the face of incontrovertible evidence" (Kütting 2014, p. 232). In conclusion, Kütting asks how it is possible to realize environmental change when political will is lacking, and power relations between states and economic actors make effective changes improbable. This report will not be able to answer this question but it will lay out some proposals for strengthening global environmental governance that could be picked up when political will emerges, even if in small steps to start with.

2. Principles for Global Governance

Building a new, higher-order level of governance is never easy, as evidenced by the long processes in human history to go from tribes to city-states to sovereign nations, and as also well illustrated in the efforts to building supranational authority in the European Union (EU). However, in a globalized world where transportation, communications and the economy have reduced the world to a neighbourhood, and the expansion of the human population, resource exploitation and environmental impacts have reached if not exceeded planetary boundaries, the need for effective global governance is evident and we argue that this is likely to require supranational authority. However, many fear anything akin to a world government, for example asking what would happen if it were taken over by a global dictator? Any proposals for strengthened mechanisms of global governance must take these fears into account and propose the limitations and safeguards necessary to build trust in global institutions and to ensure that they undertake only what is necessary at the global level (Lopez-Claros, Dahl, and Groff 2020). One approach to building in such safeguards it to use a more principled approach to determining how much and what type of governance is needed at the global level.

Principles for allocation across levels

In some domains of global governance where authority has grown stronger (e.g. trade and security) there have been increasing calls for "a more principled approach to allocating powers among different sites of governance" (Jachtenfuchs and Krisch 2016, p. 1). These calls have asked for a more principle-based approach to justify what type of (and how much) governance is needed at the global level, in relation to lower levels (Jachtenfuchs and Krisch 2016). In the field of global environmental governance, many argue the situation is reversed. Here there is reason to bring a more principled approach to the discussion on how to reform and thereby strengthen global governance (Karlsson-Vinkhuyzen 2013). The central question then becomes which principles can guide the design of more effective, legitimate, and indeed reflexive (see **section 3E below**) global environmental governance?

Several possible principles for allocating governance between levels in general and specifically for environmental governance have been suggested in the literature, including substantive subsidiarity, procedural subsidiarity, fit, culpability, capacity, concern, and consensus or consent (Table 1). Some of these are used in federal states or in the European Union. In the global context, the default principle is the consent principle, based on national sovereignty (Jachtenfuchs and Krisch 2016), requiring consensus and giving every state veto power over collective action in most international institutions. It has blocked almost all attempts to strengthen various functions of global environmental governance (see the institutional **section 4 below**). Kumm (2016), however, argues, contrary to many other scholars, that consent is not the foundation of international law. Instead, he continues, it is only for those domains over which a state has authority that can "be free to do as they deem fit and subject themselves only to obligations they have freely accepted" (Kumm 2016 p. 254). Kumm's view is clearly not reflecting political and legal practice but is, in our view, an important one to reflect on.

The principle of **fit** can be seen, for example, where the regional level is the preferred level of governance associated with marine issues (see **Appendix 4**),

including in the action plan adopted by the World Summit on Sustainable Development in 2002 (Karlsson-Vinkhuyzen 2013) . Importantly, determining what are global public goods, global commons and global issues, and more generally globally assigning a spatial 'size' to an issue is not only a matter of objective assessment, but is the subject of political negotiation where an important role is played by the unequal distribution of power (Karlsson-Vinkhuyzen 2013). The principle of common but differentiated responsibilities and capabilities (CBDR) — a combination between the **culpability** and the **capacity** principles — has served as a corner stone of most environmental regimes at least from the early 1990s. However, even if it is formally accepted, as in the UNFCCC, its application has caused continuous antagonism from several sides. The principle of **concern** could be seen to underlie much humanitarian work of the multilateral system, the move towards the Responsibility to Protect principle in matters of human rights violations, and references to human solidarity. Kumm (2016 p. 257), however, argues that "[t]alk of solidarity tends to detract from the fact that rich and powerful states bear considerable responsibility for many of the most atrocious forms of contemporary injustice and depravation." And while many agree that climate change is a moral issue as well, there is no consensus on whether to describe it primarily as a question of responsibility or of solidarity (Mayer 2015).

The most promising principle to explore as a foundational justification for reforming and indeed strengthening global environmental governance is subsidiarity. This principle has been institutionalised and operationalised in the EU after some members became concerned about too much authority at the supranational level, but it has a much longer history in philosophical and theological thought (Føllesdal 1998). Scholars have also called for its application in global governance. Carozza (2003) sees subsidiarity as providing a model of assistance and cooperation among various levels of governance that is quite different from the competition that sovereignty-based approaches create between different levels. The operationalisation of the principle into substantive and procedural components, as done in the EU, enables an explicit deliberation on how to balance effectiveness and legitimacy, the two most common criteria used for evaluating governance. Building effective global governance that can cope with catastrophic risks requires identifying how much the essential functions (see **section 3 below**) of governance systems are needed at the global level because they cannot, due to lack of ability or lack of will, be carried out at lower levels. But at the same time, the system needs to be seen as legitimate by a majority of actors (including states and peoples) for them to be willing to be subject to its authority. One important source of legitimacy is the democratic character of the system, which includes the possibility of considering the voices of people in all their diversity.

Jachtenfuchs and Krisch (2016) distinguish between weak and strong subsidiarity and argue that strong subsidiarity should be the rule due to democracy, cultural plurality, efficiency, etc. They acknowledge, however, that weak subsidiarity should apply when transnational effects threaten the security of people. Climate and environmental risks fit squarely into this domain. Kumm (2016 p. 243) argues that the "principle of subsidiarity as a general architectural principle should be seen as structuring the process of justifying restrictions on state sovereignty by international law." But it is more than this. Lee (2010 p. 331), drawing on a range of other authors, argues that states are unable to deal with global collective action problems such as climate change, and that subsidiarity's "dual function of both legitimizing and limiting higher governmental intervention is morally desirable and economically efficient", and calls for intervention of a centralised authority. Many of the global collective action problems concern public goods, as discussed above, which means that if the costs for producing them are borne by some, many more

will be free-riding on the benefits. Furthermore, subsidiarity is not restricting governance at the national level to particular forms. Knight (1996) argues that subsidiarity provides an overarching framework for global governance that extends well beyond the United Nations and different layers of government. It can involve non-state actors, individuals, civil society, regional and trans-regional entities. This means that subsidiarity allows for the diversity of approaches and experimentation characteristic of polycentric governance that is considered by many a desirable model for global environmental and climate governance (Ostrom 2014). However, subsidiarity can include strong coordination and orchestration functions at the global level and thereby address the negative effects of fragmentation that polycentric governance theory does not address (Abbott 2012). Many authors highlight the problems that the fragmented nature of current global environmental and climate governance create (Oberthür 2009; Benvenisti 2013; Mayer 2015; Kotzé 2019).

Principle	Definition	Justification	Application examples
Substantive subsidiarity	Decision-making as near as possible to the citizens	Legitimacy	European Union
Procedural subsidiarity	Governance at higher levels when lower levels *do not have capacity to act or are not willing* to act	Effectiveness	European Union, International Criminal Court
Fit	Matching the scale of the ecological system and the governance system	Effectiveness	River basin management
Culpability	Actors who are culpable for a problem should take on responsibility to address it	Legitimacy (fairness burden of responsibility)	Element of the CBDR principle in the Rio Declaration and the UNFCCC
Capacity	Actors with the capacity to do something in an effective or efficient way should take action	Effectiveness (those who are able to take action need to do so)	Element of the CBDR principle in the Rio Declaration and the UNFCCC, UN Security Council
Concern	Action taken based on concern for or empathy with those who suffer	Legitimacy (concern for the victims motivates action)	Basis for much private contribution to humanitarian aid
Consent (Consensus)	States are sovereign over their territory	Legitimacy	Current dominant international law paradigm

Source: Adapted from Karlsson-Vinkhuyzen (2013).

If we consider the UN-based climate regime with the UNFCCC and the Paris Agreement as the common rule system, the current approach to climate governance can be considered polycentric, a system which favours "the involvement of stakeholders because decisions do not rely on convincing a single, powerful ruler" (Brousseau et al. 2012 p. 15). There is not, and never has been, a supranational, hierarchical approach to global climate governance, and this is also true under the Kyoto Protocol. On the one hand, the principle of consent prevents this under these instruments, and on the other hand, the treaty provisions leave Parties free to develop their own policies for mitigation and adaptation. Governing at lower levels with a polycentric decentralized approach has many advantages such as

developing and maintaining trust, and using locally appropriate knowledge, innovation and experimentation. Applying subsidiarity makes it possible to appreciate and preserve these while at the same time prescribing actions at larger scales that are "necessary to control 'leakage', free-riding, and other pathologies" (Abbott 2012 p. 585).

Climate action is required from a range of actors beyond governments, and much is expected from private actors, subnational governments, etc. Nonetheless, research has shown that the mitigation ambition of these initiatives from non-state actors depends on states' willingness to mitigate within the UNFCCC process. While such initiatives are "potentially useful to improve the efficiency of the implementation of existing national policies, these initiatives cannot be expected to make up for lack of country-level mitigation ambition in the UNFCCC process" (Michaelowa and Michaelowa 2017). This shows the central role of the will and action of states to meet their international obligations with sufficient ambition, supporting the rationale of this report to focus on the reform of global public governance involving states and intergovernmental organizations.

Governing complex risks

Some issues or problems are harder to govern than others. This difficulty can originate in the complex character of the issue, the associated uncertainties in cause-effect linkages, the diversity of actors and interests involved, etc. Many, if not most, global environmental risks we are facing are hard to govern. In this section, we explore, very briefly, what complex risk means for governance.

A risk can be defined as an "uncertain consequence of an event or an activity with respect to something that humans value" (Turnheim and Tezcan 2010, p. 518). Global environmental risks are then the uncertain consequences for the aspects of 'Nature' that we value and indeed that we depend on for our life and well-being. The complexity of these modern risks is often considerable, and they do not meet the normal criteria people associate with the concept of risk. People expect that when there is a risk someone must have consciously taken that risk (Turnheim and Tezcan 2010). But climate change is not the result of a single person or country that has set out to gamble on the future of humanity for a short-term motive. It has arisen from a set of complex social processes including production and consumption patterns that interact with the complex nature of the climate system. Complexity means, for example, that one cannot be certain that a change in such systems can be reversed "by a simple reduction in factors responsible for a regime shift" (Woolley 2020, p. 81).

It is only over time that humanity has become aware of the severe risks entailed with these processes and patterns, forcing us to engage in risk governance, which refers to "the 'translation' of the substance and core principles of governance to the context of risk and risk-related decision-making'" (Turnheim and Tezcan 2010, p. 519). Since the causes for the risks became known, now many decades ago, there are of course countless actors that have taken conscious risks for short-term gain. A classical unpacking of risk governance identifies the elements of pre-assessment, risk appraisal, risk characterization/evaluation, risk management and risk communication.[4] These elements are considered in our discussion below (in **section 3**) of the essential functions of governance needed at the global level.

There is another aspect of the complex nature of the global social-ecological system that we can approach both as a challenge and an opportunity – the fact that it creates complex interdependencies (Mayer 2015) and that the problems can be characterized as 'commons problems,' thus a problem of common resources that we have to manage together (Berkes 2017). The concept of complex interde-

pendence “bridges the barrier between ethics and politics” because taking action based on moral duty is also “the best way to ensure one’s interest in a complex, unpredictable global game” (Mayer 2015, p. 380). The concept of a global commons problem raises the bar for human communities to achieve the level of trust and reciprocity at a global scale that is required to address such issues, in the same way that local commons users have achieved in countless places around the world over centuries, for example around the management of common grazing land or forests.

3. Governance functions

An important starting point for discussing the strengthening and reform of global environmental governance and global climate governance in particular is to identify and cluster the functions that are necessary for effective and legitimate governance. Our proposed clustering of required functions is: providing knowledge, deliberating and taking (legislative) decisions, implementing or enabling action, building trust and justice, and a cross-cutting function of learning (from experience) and 'reflexivity'. Each of these functions needs to be catered for to some degree at the global level (see below). The identification and clustering was based on the review of literature discussing global/international environmental governance through organizations and MEAs described briefly in the introduction, and adding to this a review of a few central papers on the governance of complex systems due to the characteristics of global environmental problems.[5] However, we also took as a starting point and comparison more general literature on the functions of public governance primarily in national contexts. Not doing this would risk a bias towards what is currently existing or imagined as possible at the global level by scholars rather than what is needed.

In this section, we define, for each function, the ideal of what is required to address global environmental risks, and a brief analysis of the current status of that function in existing institutions of global environmental governance.

A. The knowledge provision function

At the heart of environmental governance lies the importance of knowledge about the natural world and how our actions impact it. Such knowledge has, for countless generations, been based on close observation and experience in indigenous and local communities. With the development of modern science and technology, humanity not only dramatically scaled up its ability to degrade the environment, but also acquired the tools to detect and understand our impacts and their implication for human societies over the short and long term, locally and globally. Social science has advanced our understanding of the factors that influence individual and collective behaviour, and thus what kind of policy tools and governance could reverse our impact on the environment and contribute to healing the relationship between humanity and the natural world. These capabilities of science make it an essential foundation for global environmental governance.

An important starting point for considering the importance and design of this function for protecting the vital social-ecological systems of the earth is an understanding of the complexity and deep interconnectedness of these systems, spatially and temporarily. This implies the need for extensive monitoring systems with global reach requiring extraordinary levels of inter- and trans-disciplinary cooperation. Furthermore, it calls for the ability to adjust actions quickly to the system evolution "including the case of abrupt and discontinuous change", "how our socio-ecological systems could better cope with the risks of systemic collapse" for example by means of "firewalls and redundancies" (Brousseau et al. 2012, p. 6-7). This highlights the need for the reflexivity function (see below) and the role that the collection and distribution of knowledge plays to allow for policy change (Brousseau et al. 2012). Equally important to taking the pulse of the health of ecosystems, is research into the comparative performance of the policies deployed at different levels and into the motivations for individuals and institutions in collaborating and providing public goods (Brousseau et al. 2012).

The function of providing knowledge to environmental governance is clearly a

central one. This function can encompass (i) generating knowledge, (ii) collecting and assessing available knowledge, (iii) disseminating knowledge, and (iv) providing advice to policy makers. In the language of risk management (Turnheim and Tezcan 2010), this function comprises fact finding, risk identification, and evaluation of past policies. Below we briefly discuss these sub-functions, their potential value for global environmental governance including a potential GEA, and what the status of their provision is now, in broad terms.

I) GENERATING KNOWLEDGE

In theory, one could consider the generation of knowledge of the global social-ecological system as a public good. Wealthy countries could assign their research councils to fund global research programs. However, this would both reflect and reinforce the enormous divide in scientific capacity among countries, and as research priorities are never value neutral (whether set by research councils or scientists themselves), this would risk heavy biases towards the perspectives and priorities of the wealthy countries.

Alternatively, the responsibility for research could be given to international scientific organizations, providing more legitimacy through their global membership including national academies of sciences across the world. The limitation here is two-fold. First, these organizations have minimal funding for coordination, capacity building and only very limited funds for actual research. The funding of science continues to be a strongly nationalistic enterprise, except in the EU. The few truly international funding institutions, such as Belmonte Forum, that are focused on global environmental issues are dwarfs compared to national funding agencies in OECD countries. UNESCO as an intergovernmental organization has science in its mandate and supports global science and developing country capacity in science, but on a very small scale. The second limitation with these existing institutions is their lack of direct linkages to the work of international environmental treaty making or the work of UNEP. In a national context, research funding is often a combination of open calls allowing scientists to identify the next frontiers, and more directed calls for research identified nationally as important. The ability to stimulate, through funding, research in directions seen as important for the work of the international community, such as within the context of the negotiation of MEAs, does not exist.

II) COLLECTING AND ASSESSING AVAILABLE KNOWLEDGE

In general terms this sub-function covers any systematic gathering of knowledge – from monitoring data to research results – and assessing its implications for particular environmental problems. Such assessments can entail risk identification and risk assessment, although risk assessment overlaps with the deliberative function as it entails assigning values to what is at risk. The most ambitious institutions for assessing the state of (scientific) knowledge for use in global environmental governance are the Intergovernmental Panel for Climate Change (IPCC) (for the UN Framework Convention on Climate Change - UNFCCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem services (IPBES) (for the Convention on Biological Diversity - CBD) discussed below.

III) DISSEMINATING KNOWLEDGE

With modern information technologies, dissemination of knowledge has been greatly facilitated. The problems are more in providing knowledge in forms that are useful for various decision-makers, from local resources users to international institutions, providing guidance on how to find the most relevant knowledge from the masses of information now available, reducing the digital divide for those who

do not have access, preventing the privatization of scientific knowledge through intellectual property laws so that only the wealthy and well-endowed institutions have access, and distinguishing reliable information from content that is selected, distorted or fabricated with intent to deceive. An effort is also needed to raise educational levels so that those needing information can understand it.

Dissemination of environmental information also has to be organized at multiple scales, from the global picture of the whole Earth system down to the national and even local community level. There is also the challenge of consistently collecting and compiling data over time to develop time series, since information is often most useful when it demonstrates the dynamics of rates and directions of change.

IV) ADVISING POLICY

The organisation of science advice, through an appropriate science-policy interface is central to the function of knowledge provision at the global level. There are multiple dimensions to the scientific advisory process: the institutional frameworks, the management of the flow of information in forms useful to the deliberation process, and the human dimension of people with the capacities to generate and understand the science, to translate it into forms understandable to decision-makers, and to receive that information, take the necessary decisions and implement them.

One challenge, therefore, to global environmental governance is how to incorporate effectively the necessary science through a science-policy process into the institutions and mechanisms of global governance. Here we consider the function of providing scientific advice. In the institutional part of the report, we briefly review the history of scientific advisory bodies in global environmental governance and the present state of the process.

Kohler (2020), made a detailed analysis of advisory processes and institutions like the IPCC and IPBES. Kohler's review shows that good (or credible) science advice for policy making is more than a neutral input into the policymaking process. It needs to be representative and accountable, with buy-in by stakeholders following decision-making rules. This often requires these subsidiary bodies to routinely engage in boundary work, negotiating whose or what knowledge counts, or determining what falls within, or beyond, the scope of their authority. They are places where science advice is being co-produced in ways that warrant that more attention be given to who is, or is not, participating. Which norms of representation, participation and deliberation are seen as legitimate to ensure credibility within a science advisory body directly linked to a policy-making institution operating at the global scale? For the IPCC, and more recently under the IPBES, guidelines have been carefully negotiated for classifying what research being incorporated in assessments should be categorized as "peer-reviewed and internationally available" literature. IPBES attempts to broaden the kinds of knowledge being assessed, notably by incorporating indigenous and local ways of knowing. A more detailed analysis of scientific assessment processes based on Kohler's work, including a body of experts, an institutional body, and a body of knowledge, is provided in **Appendix 3**.

There is also a role for science in advising policy processes that explicitly seek to unpack ethical issues such as equity. Dooley et al. (2021) showed how efforts to provide meaningful knowledge for equity analysis in the climate regime (e.g. how equitable are countries' mitigation efforts) should "reflect the core principles of equity, which requires centring the needs of the most vulnerable (in the context of sustainable development), refrain from combining contradictory principles of equity into a purportedly neutral composite index… and inform, rather than supplant, the political process" (Dooley et al. 2021, pp. 303-304).

B. The deliberative and legislative function

In national contexts we expect the legislative function of the government to be performed by an (elected) parliament and based on deliberation in various arenas: in the public domain and media particularly ahead of elections, within the parliament and in other institutions. Democratic theorists like Habermas highlight the ideal value of truth-seeking/true deliberation as a foundation for law-making. However, even if such perspectives on deliberation are seen as Western notions, deliberation can "be thought of as a universal human capability for collective reasoning that is manifested differently in different cultures" (Dryzek and Pickering 2017). It is through this process that a community (at whatever level) can formulate its common goals and aspirations, and agree on the degrees of cooperation and coordination and other measures that are necessary to achieve those goals. It is also through deliberation that institutions can evaluate what past failures and successes mean for the road ahead. Therefore, deliberation is considered an important driver for the function of reflexivity in governance (see below). Who deliberates (e.g. inclusive of all affected parties) and how they deliberate (e.g. how authentic, responsive) play important roles for providing a governance system its legitimacy for those it governs (Dryzek and Stevenson 2011).

Dryzek and Stevenson (2011, p. 1870) propose that decisions may be considered legitimate when they reflect inclusive and authentic dialogue that responds to the needs of all affected parties. Such legitimacy in turn is essential for the system's effectiveness to reach positive environmental outcomes. There is evidence, for example from 'mini-publics' of citizens that have been set up for deliberative purposes, that the outcome tends to be a shift towards stronger environmental values (Dryzek and Stevenson 2011). Thus, providing the conditions and building the capacity for deliberative communicative action is a promising avenue in governance design.

One important element of the deliberative function is the ability to listen to well-founded knowledge, to relate to the scientific and other forms of knowledge that evolve and to "make use of value judgment in the definition of what is acceptable" (Turnheim and Tezcan 2010). Value judgements are always involved in governing risks, such as determining the acceptable risk, as from climate change. Scientists may identify boundaries for when ecological systems risk collapse, but it is societies that need to decide whether such collapse is acceptable – and if not, what should be done to avoid it. Decision-makers can make use of a variety of scientific tools, such as scenario analysis, forecasting and simulation (Turnheim and Tezcan 2010, p. 526). It is in this context of deliberation that the cross-cutting reflective and learning function becomes paramount: the ability to reflect on the implications of what science is telling us and translate that into relevant legislation and action. Civil society organizations (CSOs) often provide alerts and relay information between the scientific community, public opinion and governments. Thus, their access to the decision-makers and decision-making processes at the international level serves a vital function (Le Club des Juristes 2015). The inclusion of civil society in global governance processes is also essential for reasons of legitimacy, and of making a diversity of views heard. When states engage in international institutions, it is usually through their executive branches and thus the peoples' representatives are less involved.

Deliberation is important not only on the substantive problems humanity is facing but also on how we go about solving them together as humanity and as a community of states. Such meta-deliberation entails "the reflexive capacity of those in the deliberative system to contemplate the way that system is itself organised, and if necessary to change its structure" (Dryzek and Stevenson 2011). A specific exam-

ple of such meta-deliberation would be deliberation on the principles for allocating governance principles to specific levels of governance, including the global level. Lee (2010, p. 355), for example, argues that all branches of government across governance levels, and all people "can participate in the constitutional dialogue surrounding subsidiarity." Føllesdal (1998) highlights how the conscious deliberation on subsidiarity in the EU has socialized individuals with a sense of justice and a concern for the common good.

The international community of states has come a long way in terms of the intensity and scope of their deliberations, including through virtual meetings during the COVID-19 pandemic. They have excelled in the ability to sign on to joint declarations or even treaties that express common goals and desirable or obligated behaviour by states. And increasingly they are opening up these discussions to the voices of civil society organizations. The actual practice may often be characterised by conflictual and antagonistic negotiations but there are certainly degrees of deliberation, including open listening, that can be built on.

Mansbridge (2009) has identified four criteria for identifying deliberative negotiations: participation open to all potentially affected, all participants speaking truthfully, all participants are treated with respect, and shared reason-giving and reaching an outcome through mutual justification. Dryzek and Stevensen (2011), based on analysis of the existence of these four criteria, conclude that the UNFCCC negotiations perform poorly in authentic deliberation. These negotiations are procedurally open but there is very different capacity to take part, lack of trust is prevalent, mutual respect among negotiators is high but "extent of reason-giving depends on the nature of the underlying reasons: scientifically or morally legitimate positions tend to be explained, but not purely strategic positions" (Dryzek and Stevenson 2011, p. 1871). They also conclude that meta-deliberation is weak in the climate regime.

In the negotiations of MEAs there are procedures for non-state actors such as civil society organizations to gain access. They may have formal access to read statements in plenaries, to organize side-events, and in some negotiations to provide written submissions and listen to negotiations. Some of these access rights are variable and vulnerable to be constrained as soon as any one Party wishes to close the door. Nonetheless, participation of civil society with an interest in environment has been supported since the first mandate for UNEP adopted at the Stockholm Conference in 1972 (Le Club des Juristes 2015).

A promising development is the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. This is a regional agreement among the European members of the UNECE and has, since 2018, a Latin American sister treaty, the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean, or the Escazú Agreement. Both agreements are focused on giving people access in their domestic contexts. In 2005, the Parties to the Aarhus Convention adopted the Almaty Guidelines that are focused on promoting the access principle in international institutions (Le Club des Juristes 2015).

The Talanoa Dialogue held during 2018 under the UNFCCC is an interesting example of an effort at deliberation in a multilateral process. The Fijian presidency introduced a customary practice of story-telling among delegates — where criticizing or blaming others was not allowed — in an informal circle as a way to build trust as a foundation for consensus. This aimed to be authentic and inclusive, as required in democratic deliberation (Dryzek and Stevenson 2011). However, while it seemed to affect those who participated,[6] many would question whether it had broader impact, another criterion for deliberation. If new attempts are made in

this direction one has to think how to create the conditions for it to have impact.

In national contexts the legislative function is one of the three central roles of a government, next to the executive and judicial. A nation's constitution provides the fundamental framework for how a country is governed, with laws adopted by the parliament complemented by more detailed non-legal regulation and ad hoc policies such as the mandates for various authorities. Legislation in the form of treaties or customary law is also a pillar of states' efforts to address problems together in the international arena. Scholars differ on how much international law actually matters in international relations. Some argue power can easily trump law, and there is enough evidence to support this. Nonetheless, there is also strong support for the international rule of law, and countless UNGA declarations reinforce that this is desirable at all levels of governance including the global (Groff and Karlsson-Vinkhuyzen 2018). Treaties, however, are adopted by consensus, and are voluntary for states to join. Furthermore, the UN Charter gives the most universal of the UN Central organs, the UN General Assembly, only the authority to issue recommendations in the form of resolutions, or soft law. Thus, much of the overarching guidance for the direction of international cooperation, such as the Sustainable Development Goals, is not binding law in the traditional sense and establishes no legal obligations, only political or moral obligations on states. Nonetheless, the governing bodies of various UN institutions, composed of member states, provide binding decisions on the mandates of its operational arms, the secretariat, specialized agencies, etc.

In the environmental field there are over 500 international treaties, often referred to as multilateral environmental agreements (MEAs), largely developed since the 1970s (Le Club des Juristes 2015). International environmental law does not suffer, therefore, from a lack of norms, but from their fragmentation, and limitations in geographic scope (about 300 are regional agreements) and substantive scope (covering various specialised issues) (Le Club des Juristes 2015). Many MEAs, while considered legally binding and containing some explicit legal obligations with regard to effort and process (such submitting plans or reporting), include many more non-legal obligations which then are considered as mere recommendations.

States that join MEAs must then translate their commitments into national policy and legislation. A recent UNEP review of the environmental rule of law at the national level shows that implementation is the major problem (UNEP 2019).

While there are some outright success stories, such as for the ozone layer with the Montreal Protocol, many see international environmental law as having failed to reach its objective, as it does not result in the intended behaviour change of states (Le Club des Juristes 2015). International environmental law has been characterized as fragmented, incremental, and reactive instead of "proactive, reflexive and preventive" (Kotzé 2019). The obligations are often vague and lack binding legal force as a result of lack of consensus among negotiating Parties (Le Club des Juristes 2015). Implementation and compliance are highly variable (Le Club des Juristes 2015). Accountability mechanisms are weak or non-existent (see below), as are sanctions, and any state can of course leave the treaty when it so desires. Nonetheless, the body of international environmental law can also exert power through customary law serving as a basis for the jurisprudence of the International Court of Justice.

Urho et al. (2019, p. 14) in their report addressed the fundamental deficiencies in international environmental law which they considered to be the normative foundation for addressing environmental challenges. They identified as sources of the ubiquitous lack of implementation of international environmental commitments the lack of resources, information, capacity to implement, and political will. Fur-

thermore they concluded that the fragmentation of the system of environmental treaties "has resulted in 'treaty fatigue', witnessed as a deadlock in the expansion of international environmental law" (Urho et al. 2019, p. 14). Recent efforts to develop an overarching treaty, a Global Pact for the Environment, could address the fragmentation aspect and fill in important gaps, as discussed in the institutional **section 4** of this report. There are scholars who argue that international law should play the central role in limiting what states are allowed to do when their actions impact outsiders, in essence the constraints on their sovereignty (Kumm 2016). An environmental pact would provide a strong support for this.

C. Enabling and implementing function

In a domestic context we find the executive branch of the government in charge of implementing the laws adopted in parliament. They do this by taking direct action as well as by providing the financial, technical and other resources for other actors (including non-state actors such as private sector and civil society) to take action at various levels of governance. Naturally, there is considerable deliberation (negotiation) and decision-making also in the implementation process among public officials and beyond, including for filling in regulatory gaps and thus a certain overlap with the deliberative function discussed above. There is also a considerable coordination function that the government has to accomplish for cross-cutting issues across ministries and their agencies.

In a global context the executive function in the existing institutional 'infrastructure' is highly constrained – with only very weak organizations in terms of mandate and resources. There is a deficit of institutions at the global level that are tasked to ensure the systematic implementation of international law, as we would normally expect at the national level (Groff and Karlsson-Vinkhuyzen 2018). There is the United Nations Secretariat and the secretariats of its various special agencies and of the independent international organizations, yet while their 'theoretical' mandates may be highly ambitious (there is no shortage of ambition for what problems the UN should solve), their financial and human resources are vastly insufficient, as are the policy tools at their disposal. Furthermore, the global context provides a "fragmented institutional setting for the elaboration and implementation of international policies" (Oberthür 2009, p. 374) due to the diversity of institutions, many with independent governing boards (though composed of the same member states) and no ministries or Directorate Generals (as in the EU). What is required of course in such a situation is considerable coordination for cross-cutting issues to avoid incoherencies and duplication in efforts.

In the field of environment and sustainable development, the relevant UN institutions, such as treaty secretariats and UNEP, have as mandates to support the implementation of international normative frameworks such as MEAs and the SDGs, including through administering the treaties and facilitating the process of follow-up and review (see detailed discussion in **the institutional section 4**). These institutions also at times engage in what some scholars call 'orchestration', a form of non-hierarchical coordination that works for institutions that are fragmented and often formally independent from each other (Abbott 2012). The environment-oriented institutions, however, have usually no mandate to seek the integration of environmental objectives into non-environmental institutions such as for trade or finance.[7]

But they do more than this. They also engage in very concrete activities to support countries, particularly developing countries, to implement their international obligations. The rationale is that non-compliance or low implementation are often not deliberate, rather states "do not always have the human or financial means, nor

the expertise required, to enable them to comply with the obligations they have undertaken" (Le Club des Juristes 2015, p. 67). However, what these institutions can do is highly constrained by lack of financial resources – largely voluntary donations from the member states. There are simply not adequate funds for helping with treaty implementation and compliance even with funding from the Global Environmental Facility (GEF), and political issues surround the allocation of funds (Susskind 2008).[8] This is also the case for the UNFCCC with the Green Climate Fund (GCF). Linked to the constraint of financial resources is the lack of sufficient competent staff in the international institutions to provide the technical support countries need (Susskind 2008).

Within their constraints, international institutions engage in capacity building, provide (limited) financial resources for pilot projects, support the acquisition of larger funds from larger financing agencies like the GEF and GCF, provide access to technology, and often form part of efforts to coordinate various multilateral actions for environmental and sustainable development governance in the countries. Moreover, institutions such as the treaty secretariats increasingly direct their activities to non-state actors (private sector, civil society organizations, partnerships) and the general public, and carry out global public education campaigns and initiatives to stimulate and coordinate public engagement in implementing the treaties. The UNFCCC Secretariat is a strong example of this trend (Hickmann et al. 2021).

D. Trust and justice building function

This function is often referred to in the global governance literature as dealing with accountability, and with mediation or dispute settlement. Ultimately, the purpose of this function is to create trust and build justice, two essential characteristics of effective governance.

In a national context the judiciary is one of the central formal 'accountholders' vis-a-vis the laws of the land. The judiciary is expected to try any obvious offenders of the law and issue some form of sanctions, thus supporting behaviour that respects justice. The rule of law contributes to building trust in a society. While there is a well-grounded argument that accountability mechanisms are based on the assumption of mistrust and tend to be applied ex-post, they are also often seen as essential tools to build trust where it is lacking, and to secure justice.

People know that if they pay taxes and follow the law, others who do not face consequences. The judiciary is also the institution that individuals can turn to if they feel their rights have been violated and where conflicts can be resolved. Both these functions contribute to justice. But there are other formal actors that carry the role of holding the government to account. The parliament adopts the constitution and additional laws that may have as objective to build a more just society, but it also holds the government to account for the policies it adopts and other actions. The parliament in turn is often supported in its accountholder role by national audit agencies that scrutinize the government's efficiency and effectiveness in the implementation of national laws and policies. Beyond these public institutions, it is common, when constitutions allow, for civil society organizations, the media and the public to engage in holding the government to account through formal or informal mechanisms.

There is no reason to think that trust and justice-building functions are less necessary in the global context then they are in national contexts. States need to trust each other to collaborate and create international laws and organizations. Intergovernmental organizations need to gain the trust of the states and the people they serve. These organizations have few means to operate, unless they are considered legitimate in the eyes of their member states and their citizens.

The international community's history is short, in an evolutionary perspective, and filled with war, colonization, and countless injustices perpetrated by states towards other states. Now all states are facing common existential risks. Naturally, the building of trust and justice is essential to create the foundation for the high degree of collective action that is needed. This is evident considering that the mistrust between different groups of countries, primarily between developed and developing countries but also among subgroups within and across these countries, has been one of the major challenges for global environmental governance. It is, however, an open question whether it is possible to elicit the required trust and cooperation for managing the global commons without "strong efforts to redistribute not only wealth but also various kinds of capabilities" (Brousseau et al. 2012), in other words without more justice.

For people living in areas with failing states, international institutions may be the only ones they can turn to and trust. Similarly, when people's human rights are abused by the very states that are obliged to secure them, only the existence of international institutions can give them justice. The same should apply for securing peoples' environmental rights and indeed the rights of non-human species and environmental entities. All states should have a "duty of justice to also act as trustees of humanity" and bear this in mind when their policies create impacts that affect justice for other states and peoples (Kumm 2016, p. 20). International institutions are also needed that can solve disputes and "disagreement over questions of justice" among states – as the alternative is domination by the powerful who then can dictate their conception of justice (Kumm 2016, p. 246). These institutions also need to have the possibility to monitor and enforce compliance with the rules that states have collectively agreed to manage global commons, as is needed in all commons regimes (Ostrom 2014).

Intergovernmental organizations with operational activities by necessity have long experience in trust building with the states and people they work with – and over time institutionalised accountability mechanisms so that those who are impacted by their activities have avenues for justice. While there is surely much to improve in this regard, we do not focus on the accountability of these organizations in this report – considering that environmental institutions have a very minor operational presence. Rather we focus, in our analysis of the current status of the trust building function, on building trust among states in their engagement in global environmental governance, particularly in MEAs. A vital aspect of trust here is whether they live up to their obligations in those agreements and their accountability if they do not.

There are formal processes to follow up states' obligations in MEAs and other commitments - involving reporting, sometimes verification, and review of (lack of) progress. But overall, across MEAs and non-legal frameworks, the stringency of reporting is weak. More importantly, there are few and mostly very weak mechanisms for analysing those reports and formally holding states to account for failing to meet international legal or moral obligations. Very few MEAs have the mandate to issue real sanctions and when there are non-compliance procedures (which applies to about 15 MEAs), they are not dealt with by a judicial body (Le Club des Juristes 2015). These bodies also do not accept referrals from non-state parties (Le Club des Juristes 2015) and states are reluctant to refer each other to such procedures as this would influence their relationships. Concerns of eroding national sovereignty are often given as a reason for refusing to create accountability mechanisms with tangible consequences for insufficient implementation. The explicitly facilitative accountability mechanisms that have been adopted e.g., under the Paris Agreement, are explicitly designed to build trust (rather than accountability or justice).

Turning to the current status of the justice building function, the International Court of Justice (ICJ) serves the role of ensuring justice in disputes among states, but it has the fundamental limitation that it is voluntary for states to submit cases for its ruling. For environmental issues, states are even more reluctant to accept the jurisdiction of a third-party mechanism in a dispute with other states (Le Club des Juristes 2015). This is clear from the fact that ten percent of the 72 states that accept the jurisdiction of the ICJ have noted reservations for environmental issues (Le Club des Juristes 2015). Nonetheless, the ICJ does over time establish valuable case-law in this field and has developed the corpus of environmental norms (Le Club des Juristes 2015).

Finally, while there are dispute settlement mechanisms set up for the trade regime, they are seldom set up for MEAs. The kind of disputes that do arise usually require "negotiation rather than adjudication" and are therefore addressed by the Conference of the Parties instead (von Moltke 2006).

E. Learning and reflexivity function

The learning and reflexivity function is a cross cutting function; the other four functions together have to contribute elements of, or benefit from, this function. The need for learning in governance systems seem obvious considering the new territory that humanity, and global (environmental) governance is charting in addressing the complexity and uncertainty of the future. One of the dimensions where learning is most urgent is to enable the global governance system to reflect and reconfigure itself to improve its performance. Reflexivity can be defined as "the inbuilt capability of a system that offers the possibly to learn from past experience and to adapt as a consequence—'by watching itself do'..." (Turnheim and Tezcan 2010, p. 527). Pickering (2019, p. 1150) explains the particular function of ecological reflexivity as: "the capacity of an entity (e.g. an agent, structure, or process) to: recognize its impacts on social-ecological systems and vice versa; rethink its core values and practices in this light; and respond accordingly by transforming its values and practices." The three core elements of ecological reflexivity are thus recognition, rethinking, and response. This function would of course need to be continuous over time, but there may be specific processes and moments when it is more explicit. Reflexivity is closely related to the concept of adaptive governance - governance that can handle rapid change and build in feedback learning. Berkes (2017, p. 9) argues that adaptive governance "requires learning from, and improving on, practices of collaborative learning, with a focus on institutions at all levels from local to international." Learning and reflexivity are thus intimately connected – reflexivity requires learning from a rapidly changing environment, from past experience, and from feedbacks between earlier actions and the environment. Reflexivity requires the design of institutional frameworks that can reform themselves (Brousseau et al. 2012).

The 'recognition' part of ecological reflexivity is served by the knowledge provision function that includes data collection, monitoring and research on essential elements of the social-ecological earth system, but the knowledge also needs to reach and indeed inform global policy-makers. The deliberative and legislative function needs to rethink its core values and practices in the light of the signals coming from the social-ecological systems. Rethinking, however, can also be supported by processes in the trust and justice building function where these evaluate the adequacy of past actions with a perspective towards learning. The response to such rethinking can come both from adopting new or revised legal frameworks in the legislative function to change the behaviour of member states, and from actions by intergovernmental organizations performing the enabling and implementation function.

For millennia in the past, the capability for ecological reflexivity was expressed in

the very localized context of what is referred to as indigenous or traditional knowledge – human societies closely dependent on their environmental systems recognize their impact on those systems, rethink how they use them and respond. When they failed to do so they perished. However, one optional response was to move, migrate, and leave the exhausted ecosystem behind. In a crowded world this option is seldom possible, and other response options at local or even national level do not go far with many outside drivers of environmental degradation. Moreover, while local communities and indigenous people who observe the environment closely may still monitor and recognize local environmental changes, many changes resulting from industrialization require sophisticated scientific tools to be detected across environmental media from the soil to the stratosphere. This function of ecological reflexivity is therefore now required on a planetary scale, and there are warnings that mass migration may be a forced consequence of failure to act.

A brief analysis of current global environmental governance shows many efforts and ambitions to learn, but considerable uncertainty about their impact. The institutional frameworks to enable learning between international environmental institutions are weak (Oberthür 2009).

The present system of global goals and their implementation within and beyond MEAs can be considered polycentric – as states are usually free to choose their policy measures to achieve those goals – there is considerable potential mutual learning from experimenting with different strategies and policies (Turnheim and Tezcan 2010). At the same time learning can be hampered by high fragmentation (Abbott 2012) that may keep these opportunities for learning across countries from being used effectively.

Reflexivity is harder to demonstrate. Many global environmental governance processes include reflection on past performance and what this should mean for future actions, but they have many limitations in what could be termed the 'global goal setting dynamic.' States adopt ambitious time-bound global environmental goals. When the target year approaches, they make a quick assessment of aggregate implementation, which usually shows very poor goal achievement. Then they move on to adopt even more ambitious goals. These assessments avoid analysis of the individual performance of states or intergovernmental organizations. They provide very superficial and general analysis of the reasons for poor performance, with a discussion that is deeply politicized rather than open for rethinking core values and practices. The response is new goals and general non-committing recommendations. Moreover, the sub-function of recognition has its limitations – for example when the complexity of the system makes "decision making on when, how and how quickly to regulate ecosystem-disrupting activities as causes of potentially problematic change" difficult (Woolley 2020, p. 80).

In the climate regime, the Talanoa Dialogue on the progress towards the goals of the Paris Agreement in 2018 added depth and quality to the reflection process, but the response in the text adopted by the COP was extremely weak. The global stocktake coming up in 2023 and every five years thereafter seems designed to serve the reflexivity function in the climate regime, but how effective it will be remains to be seen.

4. Global environmental governance institutions and reform proposals

Background

Global environmental governance has always been a relatively neglected area, starting late after most parts of the UN system were already in place, making it hard to find a place at the table. The pressure of accumulating environmental problems has led to occasional breakthroughs, but never adequately resourced and subject to changing fashions and strong resistance from governments giving first priority to national interests, whether political or economic. Nonetheless, there have been several waves of interest in global environmental governance in both the academic and policy communities making frequent proposals for reforms, some legal, others institutional or procedural, but few have led to tangible changes. The first wave was in the lead-up to the UN Conference on the Human Environment in Stockholm in 1972. Some governments were opposed to creating any new institution there, but the United Nations Environment Programme (UNEP) was launched as a catalytic and coordinating body to integrate environment across the UN system. The neoliberal direction of economic policies in many countries from the 1980s had as one aim to minimise government interference with market forces and this was a major brake on international collaboration for the environment. With the end of the Cold War in 1991 and the resulting new era of hope, the planning of the UN Conference on Environment and Development (UNCED) in 1992 was a high point, as it adopted an action programme for the 21st Century, Agenda 21 (UN 1992), the climate change and biodiversity conventions, as well as advancing the convention on desertification. The conference failed, however, to adopt a forests convention or an Earth Charter (adopting instead a list of principles – the Rio Declaration). However, UNCED did not address the strengthening of UNEP and instead created a new institution, the Commission on Sustainable Development, under the UN Economic and Social Council. The next opportunity was at the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, but the major effort there was just to hold the line and to prevent regressing from the achievements in Rio. Strengthening environmental governance was a major objective of Rio+20, the United Nations Conference on Sustainable Development (UNCSD) in 2012. It made progress in two areas: expanding the governing body of UNEP to a UN Environment Assembly (UNEA) with universal membership of all countries, and launching the process that led to the adoption in 2015 of the UN 2030 Agenda and its Sustainable Development Goals. Beyond this, however, progress was limited.

The following sections review briefly a wide range of reform proposals aimed at strengthening global environmental governance either through new organizational mandates and structures or through new norms (laws, regulations, declarations). These proposals were identified through an expert guided semi-systematic literature review. On the organizational side, the main debate has been between reforming UNEP within its existing status as a programme, a subsidiary body under the UN General Assembly, or upgrading UNEP to a specialized agency like WHO or FAO, with its own intergovernmental body, budget, and assessed contributions. As the environmental debate has expanded to encompass sustainable

development, so have the reform proposals. The papers reviewed also include several more radical approaches to integrated and transdisciplinary global governance covering the environment among other issues. One special focus is on the structures and processes to provide scientific advice for policy making. On the institutional/regulatory side, one dominating debate is around the fragmentation of international environmental law – and the low degrees of implementation and compliance.

In this report, we summarize the most significant proposals for the reform of UNEP, proposals to upgrade UNEP to a World Environment Organization or even to combine it with UNDP. We also review international environmental law and the possibility of combining Multilateral Environmental Agreements (MEAs) or creating an International Environmental Court. Some proposals concern the World Trade Organization, UN institutions like the Trusteeship Council or the Security Council, or a new Global Resilience Council, and even broader UN system reform including the environmental dimension. For climate change touching all aspects of life, more multi-layered polycentric approaches are suggested.

Reform of UNEP

UNEP was designed at Stockholm in 1972 to be the leading global environmental authority that sets the global agenda, promotes the adoption and implementation of environmental goals and agreements, integrates the environment into the work of the whole United Nations system, and serves as the authoritative advocate for the global environment. The 1997 Nairobi Declaration refined UNEP's functions which came to include: environmental assessment and early warning; international environmental law and linkages between conventions; international norms, principles and policies; coordination of the UN system in the field of environment; environmental awareness and cooperation; and policy and advisory services for institution-building.

EVALUATIONS OF UNEP AND ITS CHALLENGES

Ivanova (2012) argued that there has been almost no improvement in either the global environmental problems or the effectiveness of global environmental governance since the early 1970s. She considers the reasons that existed for creating UNEP in 1972 are equally valid today. Furthermore, she considers that its weaknesses are not to be found in its institutional form and, therefore, can also not be addressed by simply upgrading its status to a specialized agency. Ivanova (2012) therefore concludes that any reform of UNEP needs to have as its objective to enable the organization to achieve the role intended for it as an effective anchor institution for global environmental governance.

The most recent review by Ivanova (2021) concludes that UNEP has accomplished much, including facilitating the treaty that enabled resolving the threats to the ozone layer as the one global environmental success, but it has not managed to ensure the coherence and effective implementation of international environmental law, and has not had the resources and capacity to support sufficient national implementation of environmental treaties. The core financial mechanism for UNEP, voluntary contributions, has been particularly vulnerable, preventing UNEP from meeting the ambitious goals that were set for it to be the environmental conscience of the UN system and the authoritative voice for environmental action. Its budget has become largely donor driven, reflecting donor priorities. It is just one of many environmental organizations rather than the anchor institution, because it lacked sufficient capacity, connectivity and credibility. It has faced problems of institutional design, leadership and location. It has also suffered

because the environment has not been a priority for many states, marginalizing UNEP at the international level (Ivanova 2021). **Appendix 4** gives two practical examples of the successes and challenges faced by UNEP as a small and under-resourced institution responsible for complex global issues across the science-policy interface.

There is widespread agreement about UNEP's problems, summarized by Bauer (2013). UNEP is supposed to be at the centre of global environmental governance, but faces a gap between expectations and capabilities. It has faced structural obstacles including the North-South divide in the priorities given to environment or development and its lack of a mandate as an implementing agency that could assist developing countries on the ground, with that role going to UNDP. The concept of sustainable development, vague and adaptable, and the emergence of the Commission on Sustainable Development in 1992, blurred competences and drew away the attention of the Major Groups of civil society identified in Agenda 21, that found it hard to go to meetings at UNEP's headquarters in Nairobi. There has been continuing scepticism of countries such as the US, China, India and Russia towards strengthening UNEP. The proliferation of MEAs beyond UNEP's control added to institutional fragmentation and political competition.

In his 2005 assessment, Tarasofsky (2005) notes that UNEP's catalytic role requires partnerships, credibility and resources. Its strengths are in policy formulation, scientific assessment, its regional structure and links to many institutions within the United Nations and with international financial institutions, as well as civil society, with a commitment to build capacity in developing countries. It has made important achievements in environmental law, and linking science and policy through its Global Environment Outlook (GEO) reports. He argued that reform was needed because its budget was insufficient, and its role and focus had been questioned after UNCED. He saw it needing to be a more forceful voice faced with the lack of coherence between international bodies and UNEP, and it lacks adequate authority to coordinate. The broad UNEP mandate is a weakness, especially with its insufficient funding declining after 1992 (Tarasofsky 2005).

Chen (2010) approaches UNEP reform from the often neglected perspective of developing countries, since the agenda is largely driven by Northern countries. Developing countries and their individual concerns should play a crucial role within reform discussion, since they have to promote their development as well as environmental protection. They face obstacles including a lack of resources and capacity, the North-South gap, and difficulties in coordination. Chen calls for a democratization of UN decision-making processes, linking environment, development and social equity, suggesting that UNEP was mandated for policy coordination but was designed to make this impossible. Rather than coordinating, it could serve as a control centre for synergies, with a wider role in networking. Chen further argues that it should focus on broad policy issues, authoritative scientific advice, capacity building, knowledge generation, and a prosperity and equity agenda.

Gupta and Stec (2014) suggest that UNEP also needs to strengthen its legitimacy and effectiveness through engaging much more with civil society. They build on but go beyond an independent expert group appointed by UNEP that has suggested the advisory function of stakeholders needs to be detached from the representative function, and that "civil society engagement would be enhanced by shifting some responsibilities for organization to civil society itself" (Gupta and Stec 2014, p. 1). Some of the issues that would need to be addressed include both procedural and substantive aspects of stakeholder engagement, the legitimacy and representativeness of stakeholders, and the danger that business and industry can easily

outweigh civil society. Therefore, they advise only to use participation "carefully and selectively" with a rights-based approach and better quality of information in an advisory capacity (Gupta and Stec 2014, p. 5). Local governments should be separated out from the civil society groups as they represent governments albeit at local level. They ask if scientists should be a major group or a separate category with the role to provide expert advice. Gupta and Stec (2014, p. 1) finally argue that the system for engaging with civil society is set up in a way that, if there are regular opportunities for review and institutional learning, it could lead to a "practical and more effective way of scaling up participative processes at the global level."

RECENT PROPOSALS FOR UNEP REFORM

Ivanova (2021) has described the many proposals for institutional reform, and how every UNEP Executive Director has instituted a reorganization of its administration, priorities and processes of delivery. She describes how special efforts were made at UNCED in 1992 followed by calls for a World Environment Organization at the Rio+5 conference in 1997. While this call was not heeded, it spurred the creation of the UN-wide coordinating body, the Environment Management Group, and the annual Global Ministerial Environment Forum in 1999. Despite a proposed reform package, no decisions on UNEP reform were made at the World Summit on Sustainable Development in 2002. Several years of renewed consultations on international environmental governance leading up to Rio+20 in 2012 led to one significant reform, the creation of the UN Environment Assembly with universal membership, when the UNEP Governing Council had 54 members (Ivanova 2021).

Tarasofsky (2002) has suggested that a reformed UNEP's approach to international environmental governance should be multifaceted, innovative and integrative, thus providing a forceful voice for the environment, both within and beyond the United Nations. Tarasofsky (2002, p. 28) argues that by "combining policy leadership on a limited set of priorities – established through mechanisms that link the national, regional and global levels" and with "support for ensuring effective implementation of these policies," a stronger UNEP could "play the central role in international environmental governance." He further argues that an important success factor for UNEP will be to define and enhance "the mechanisms at the appropriate levels that create the linkages and feedback loops necessary to foster innovative solutions, stakeholder ownership, and effective implementation" (Tarasofsky 2002, p. 28).

Bauer (2013) identifies five functional objectives for a reformed UNEP: a strong science base, its authoritative voice for the environment, working for coherence within the UN, adequate funding, and being responsive to country needs. He proposes the integration of environment into peace and human rights as well as sustainable development and law, aiming for a synergistic polycentrism and enhanced multilateral cooperation. The UN should be strengthened with participatory mechanisms and some qualifying of national sovereignty, which would require another constitutional moment with the amending of the UN Charter (Bauer 2013).

A 2019 report for the Nordic Council of Ministers (Urho et al. 2019) provides a detailed assessment of the state of international environmental governance centred on UNEP and organized by function, looking at: governance, funding, voice and coordination, science-policy interface, environmental information and awareness-raising, capacity building, regional presence and headquarters functions, stakeholder engagement, MEA synergies and the Global Pact for the Environment. It takes an evolutionary approach, with a range of proposals from the immediately practical to the desirable but probably not realistic in the present political context (Urho et al. 2019).

Urho et al. (2019) propose the following options for action for UNEP, its Committee of Permanent Representatives (CPR), the UN Environment Assembly (UNEA) and the Multilateral Environmental Agreements (MEAs):

- "Utilize UNEA to bridge thematic boundaries of MEAs, and align their activities in UNEP's programme of work;
- Consider ways to strengthen the role of stakeholders, so their contribution to promoting UNEP's agenda can be maximized at all levels, including by cities;
- Enhance synergies among MEA, work in clusters and beyond, including consider the possibility of advancing integrated reporting;
- Increase impact of decision-making in UNEA, and ensure proper follow-up of decisions taken and sufficient guidance for national implementation;
- Seek to institutionalize science in UNEA, maximize multidisciplinarity of existing panels and enhance their mutual cooperation;
- Increase the link between environment with human rights, including taking steps to enshrine the human right to a healthy environment;
- Clarify the relationship between UNEA and CPR bodies to ensure efficient preparation of UNEA and sufficient oversight in the intersessional period;
- • Strengthen capacities in developing countries through properly resourcing regional and sub-regional centers, to ensure sufficient engagement in UN country teams;
- Make UNEP's programme of work more attractive to governments, increase understanding of its value and ensure its proper follow-up;
- Expand understanding of gaps in international environmental law, set a clear vision and timeline to address them, and build on best practices." (Urho et al. 2019, pp. 87-88).

Ivanova's most recent review (2021) concludes that global environmental governance requires not reform but transformation, including changes in governance structures and processes, behavioural change that disrupts the status quo, and cognitive change in beliefs, values and norms, with the 50th anniversary in 2022 as the opportunity for UNEP to become the authority on the global environment through integrated solutions combining normative and operational action. She argues that it presently lacks the capacity to do this and that building on its core function of environmental assessment and knowledge management, it should deliver the scientific foundation and political dialogue to address the environmental state of the planet. Ivanova further argues that, since international governance has largely failed on implementation, UNEP should develop an implementation-monitoring and review mechanism, with continuous and transparent reporting. The UN Environment Assembly should become the political forum that assists governments to attain positive outcomes. Over the decades, global environmental governance has fragmented along sectorial issues: climate change, biodiversity, chemicals, ocean pollution and other issues, but UNEP is the only institution with a mandate to assess the whole planetary system in all its complexity, and could use its broad environmental assessment mandate, bridging science and policy, to inform the world of the dangers already unfolding and the necessary ways forward (Ivanova 2021). By assessing the implementation of environmental conventions, the risks of failure, and the gaps in capacity that need to be filled, Ivanova argues that UNEP can build increased collaboration, especially on issues that cross the competence of many conventions by providing a comprehensive overview, but one requirement for this to happen is more stable and consistent financing of UNEP's core activities. UNEP should provide leadership as the champion of the Earth, the anchor institution for the necessary positive vision and the delivery of solutions to the ever-evolving environmental challenges facing the planet (Ivanova 2021).

Upgrading of UNEP – World Environment Organization

Already in the decade after the 1992 Rio Earth Summit, Lodefalk and Whalley (2002) identified seventeen proposals for the founding of a World Environment Organisation (WEO), whether as a coordinating agency, to set rules, to settle disputes, to integrate multilateral agreements, or to elaborate global policy proposals with draft covenants. Their review of these proposals made them conclude that a WEO was often seen as a necessary equal partner to the World Trade Organization (WTO) in creating a multi-lateral rule-based system. Lodefalk and Whalley (2002) argued that global environmental policy- and rule-making was too slow to evolve, short term, patchy, badly coordinated and inconsistent and that the current global environmental regime, including UNEP, was not up to the task, institutionally weak, fragmented, lacking standing and not providing optimal environmental protection.

Biermann and Bauer (2005), and Chambers and Green (2005) both edited multi-author books with arguments for and against a WEO. The most relevant chapters are summarized in this review.

Steve Charnovitz (2005) considered the case for a WEO of moderate centralization, with functions including planning, data-gathering and assessment, information dissemination, scientific research, standards and policy-setting, market facilitation, crisis response, compliance review, dispute settlement, and evaluation. He considered structural issues that would need to be determined to include the role of environment ministers, WEO leadership, participation by elected officials and NGOs, WEO membership, and its relationship to MEAs (recodification, federation of secretariats, clustering by problem or by institutional function). Charnovitz (2005) also raised questions of orientation, whether it should address environment or sustainable development, only global problems, just policy or be operational, and undertake capacity-building. Finally, he concluded that in order to assess a WEO proposal, it would need to improve the current approach to governance with internal and external coherence; strengthen the interface between science and politics; improve financing; increase participation; and increase influence over policy.

Oberthür and Gehring (2005) on the other hand saw no qualitative difference between an organization and a regime. They said that institutional rearrangement can modify decision-making procedures and/or change institutional boundaries, but not ensure effective enforcement. Non-cooperating states cannot be excluded from benefits to the global commons. Furthermore, they argued that a WEO cannot be at the same time realistic, significant, and beneficial for international environmental governance and that an organization using existing UN procedures of consensus and voluntary implementation would be irrelevant. Integrating decision-making in comprehensive negotiations on the WTO model would be dysfunctional for preserving the collective good. A supranational WEO with majority decision-making and enforcement on the EU model would be grossly utopian. They concluded that available resources would be better invested in advancing decision-making in existing regimes.

More recently, Manga (2010) made a proposal for setting up a World Environment Organization that would be composed of two central units: a Scientific Body to measure and adopt sustainable standards, quotas, limits of production or emission, sustainability indicators, methodologies for risk assessment and management and their harmonization, and all other scientific tasks; and a Disputes Settlement Body to implement and apply the sustainable indicators measured and adopted by the Scientific Body. Manga (Manga 2010, p. 217) then argues

that scientists should be selected not only based on their scientific abilities, but also for "their impartiality, integrity, dedication and commitment to sustainable development and to sustainability in natural resources management and genetic resources utilisation." Manga's argument for this design was that disputes settlement in sustainable development has been ignored within the UN system because of its potential impacts on free trade and economic liberalization. This is the main source of ongoing conflicts between WTO activities and sustainable development policy, where UNEP has no equivalent disputes settlement body (Manga 2010).

Olsen and Elder (2011) similarly called for strengthening international environmental governance by reforming UNEP as a specialized agency and legally autonomous universal decision-making forum with alternatives to the consensus rule, and discussed the financial, legal, and structural implications. They suggested the organization should be responsible for the clustering of MEAs and elevating the status of the environment, with independence from the UN General Assembly and ECOSOC dominated by economic and social issues. Furthermore, they proposed that it would need more and predictable funding, and a mandate to respond to demands on the regional and national levels.

Desai (2014) described sorting out the clogged terrain of MEAs as the biggest challenge of coming decades. He called for a stronger institutional structure for UNEP to support the negotiation and implementation of treaties, dispute settlement, and their necessary financial and technical assistance. (Desai 2014a, p. 207) This would mean creating a specialized agency, the United Nations Environmental Protection Organization, reporting to a reformed Trusteeship Council, and including a science & technology council, an environmental law & policy council, and an environmental emergencies relief council. (Desai 2014a, p. 211).

MERGING UNEP AND UNDP

One issue frequently raised in the debate about global environmental governance is the role of the UN's programmes for environment and development (UNEP and UNDP) in the wider context of the changing dominant focus of the international agenda, from environment to sustainable development. Mee (2005, p. 227) asked if the environment should be a sector at all, considering "the fragmentation of current institutions, the need for strengthened technical and scientific support, the importance of addressing problems at their root causes and the need to increase the devolution of global governance to the regional level." Mee notes that providing reliable information is an essential core function of UNEP, while better knowledge transfer and stakeholder participation are the roles of UNDP. Mee therefore proposes consolidating UNEP and UNDP into a single organisation that "conserves and strengthens vital technical functions but enables a balanced and integrated approach to sustainable development" (Mee 2005, p. 227).

SCIENTIFIC ADVISORY PROCESSES

A recent review by Pia Kohler (2020) provides a detailed overview of science advice and global environmental governance, based on which she draws a number of general lessons. The brief history provided in the following paragraphs draws entirely on her study. In the beginning, the scientific community had already been organising to coordinate research and share knowledge at the global level. The International Union for the Conservation of Nature (IUCN) was founded in 1948 as somewhat of a hybrid between an intergovernmental and a nongovernmental organization linking science with conservation action. UNESCO established an Advisory Committee on the Arid Zone Research Programme 1951, to be supplanted in 1965 by an Advisory Committee on Natural Resources Research until 1971, when it was in turn replaced by the Man and the Biosphere Programme. Within the International Science Council (ICSU) combining all the academies of science

and international scientific societies, a Scientific Committee on Problems of the Environment (SCOPE) was established in 1969 for the identification and analysis of emerging environmental issues caused by or impacting humans and the environment. There was also the International Human Dimensions of Global Change Programme (IHDP), active from 1996 to 2014, among others.

As Multilateral Environmental Agreements (MEAs) were negotiated and adopted, science was frequently mentioned as a source of guidance, and sometimes specific scientific advisory processes were created. For example, the 1946 International Convention on the Regulation of Whaling provides that any amendment to its schedule (which lays out permitted whale harvests) should have a scientific justification. In the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the convention text itself defers to country-designated scientific authorities that will be charged with carrying out the convention's goals, but only in 1987 were the Animals and Plants Committees established by the parties to contribute biological and other specialized knowledge about species of animals and plants for which CITES trade control was or would be necessary. The 1998 Rotterdam Convention provides from the start for the establishment of a Chemical Review Committee that considers chemicals to be added to the scope of the convention's Prior Informed Consent Procedure.

Some stand-alone institutions with a mandate to produce scientific assessments were also launched on critical issues. The best known is the **Intergovernmental Panel on Climate Change** (IPCC) created in 1988 as a joint venture of the UN Environment Programme (UNEP) and the World Meteorological Organisation (WMO) with three parallel working groups. It is seen as the epitome of a science advisory body in global environmental governance, awarded the 2007 Nobel Peace Prize (along with Al Gore) "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change." While the 1992 UN Framework Convention on Climate Change (UNFCCC) has its own Subsidiary Body on Scientific and Technological Advice (SBSTA), it is a universal membership body, so parties have tended to send diplomats rather than scientists. The IPCC continues as the de facto source of science for the convention.

The Convention on Biological Diversity (also adopted at the 1992 Rio Conference) provides for a Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), but as with the comparable body under the UNFCCC, it became diplomatic rather than taking on the task of coordinating, and assessing, available science to advise policymakers. It took the Millennium Ecosystem Assessment (2001-2005) to finally lead to the creation of the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services** (IPBES) in 2012 with foundational principles to "be scientifically independent and ensure credibility, relevance and legitimacy through peer review of its work and transparency in its decision-making processes" and "provide policy-relevant information, but not policy-prescriptive advice, mindful of the respective mandates of the multilateral environmental agreements" (IPBES 2012, p. 2). As the most recent of the major scientific assessment institutions, IPBES has broken new ground, such as by recognizing and respecting the contribution of indigenous and local knowledge to the conservation and sustainable use of biodiversity and ecosystems. It also acknowledges the unique biodiversity and scientific knowledge thereof within and among regions, and the need for the full and effective participation of developing countries and for balanced regional representation and participation in its structure and work. It takes an interdisciplinary and multidisciplinary approach that incorporates all relevant disciplines, including social and natural sciences, while incorporating gender equity in all relevant aspects of its work (IPBES 2012, p. 3).

IPBES is defined as having three functions beyond the production of assessments, namely, knowledge generation, capacity-building and policy support. Kohler has documented the expanding role of scientific advice in implementing MEAs.

Susskind (2008) proposed the creation of standing regional science advisory bodies for groups of related treaties. As one reason for this, he argued that developing countries often find it challenging to find qualified scientists to represent them in the various bodies, and this means that the effort to balance membership between regions in each scientific body for every treaty "rarely leads to panels that are the best-equipped to provide ongoing technical advice or oversee global research efforts required to enhance treaty implementation" (Susskind 2008, p. 69).

We see that scientific consensus emerges and influences policy outcomes through conferences and other exchanges, through which an international community of experts from a cross-section of disciplines develops a common understanding of the issue under consideration. Biermann (2014) has proposed institutional reform to establish an 'Earth Alliance' that would include a UN Global Environmental Assessment Commission of scientists to feed authoritative insights on the state of the environment into intergovernmental decision making.

An important recent development in the support of scientific advisory processes is the creation of an **International Network for Government Science Advice** hosted at the University of Auckland under the auspices of the International Science Council. The network provides a forum for policy makers, researchers, national academies and scientific societies to share their experience, build their capacity, and develop approaches to the use of scientific evidence for government policy. It maintains a website with a collection of existing guidelines for science advice.[9]

INTERNATIONAL ENVIRONMENTAL LAW

If creating a World Environment Organisation is not possible, one alternative frequently proposed is to cluster Multilateral Environmental Agreements (MEAs) in some way.

Von Moltke (2005) explains that the environmental agenda includes several issues with distinctly different problem structures, and subsidiarity is needed to distribute environmental functions. This has resulted in too many international environmental regimes, but their merger would be daunting, with different parties, constituencies, civil society structures and secretariat locations. As a leading proponent of clustering, von Moltke (2006, p. 409), has warned that the connection "between international economic and environmental policy has grown increasingly powerful, and threatens to result in deadlock unless some of the organizational issues are resolved". Where the merger of conventions is not feasible, he goes on to argue that clustering of institutional and organizational arrangements short of merger could "increase the efficiency and effectiveness of existing agreements without requiring elaborate changes in legal or administrative arrangements" (von Moltke 2006, pp. 411-412). Clustering could, according to Moltke, involve many aspects of MEAs: conferences of the parties, colocation of events, a permanent location, executive and subsidiary bodies; secretariats; financial matters such as regime budgets, development assistance and subsidies; electronic clustering; communications; a cluster coordinator; implementation review; and capacity building. Clusters could be created by topic: the conservation complex; the global atmosphere; the hazardous substances complex; the marine environment complex; the extractive resources complex (von Moltke 2006). Moltke suggests that joint institutions could be established for science assessment, monitoring and environmental assessment, transparency and participation, implementation review, and dispute settlement, and that this would need to be mirrored in national coordination, including the domestic distribution of respon-

sibilities, constituencies, and the politics of coordination. How to begin? The first and last steps would be the hardest, requiring a state as champion (von Moltke 2006).

Susskind (2008) shows that the global environmental treaty-making system is not correcting the problems these treaties are intended to address. For many, the goals set are so modest that even if implemented, they would not reverse the problem. Others, he argues, have not been ratified by key countries, and even when ratified, countries are slow to bring their national legislation into conformity with their treaty obligations, or to report on progress, even if they take their obligations seriously. Susskind stresses that funding is inadequate, and scientific research to back up the treaty may only be funded after it is adopted. In his view, political considerations may outweigh scientific judgements and no single institution has responsibility for building institutional treaty-making or implementing capacity (Susskind 2008). Ongoing North-South tensions get in the way, and we have lost sight of common but differentiated responsibilities, and that some countries need more time or extra assistance (Susskind 2008). According to Susskind, global environmental treaties can succeed only if all countries agree to accept a common goal, but there are few incentives for treaty compliance and few penalties for non-compliance, and few visible economic benefits. For Susskind, the treaty-making system could be improved by "increasing the role of 'unofficials' in treaty drafting and implementation, setting more explicit adaptive management targets, offering financial incentives for treaty compliance, and organizing regional science advisory panels to enhance the level of scientific advice available to all nations" (Susskind 2008, p. 63).

Matisoff (2010) shows that most international environmental agreements rely on parties to raise disputes and enforce commitments, causing individual countries to bear the cost of enforcement. In addition, Matisoff emphasizes that bringing a dispute to an arbitral tribunal requires the agreement of the parties to the dispute. In contrast, the (now) Court of Justice of the European Union allows for enforcement to originate from a strong central authority. This results in stronger enforcement mechanisms more likely to result in enforcement action, and that are more effective in generating behavioural change (Matisoff 2010).

Urho et al. (2019, p. 14), as already noted above, considered the lack of implementation of existing commitments and obligations in many MEAs to be "a pervasive feature of international environmental law that is often closely linked to lack of resources, information, capacity to implement, and political will." They also concluded that, on the whole, there was no more movement to expand international environmental law (Urho et al. 2019). As a way forward Urho et al. (2019, p. 14) saw as relevant the role of UNEP, especially through its Montevideo Programme for the Development and Periodic Review of Environmental Law, as this "could be developed into a dynamic platform for proactively screening and addressing… gaps."

Urho et al. (2019) show that enhancing synergies among MEAs has been a fundamental part of governance reform, and there has been progress. The Basel, Rotterdam and Stockholm (BRS) conventions have been synergized, with a new secretariat with joint administrative and programmatic activities and a joint head, without compromising the independent legal nature of the conventions, but it has so far not been possible to merge the BRS and Minamata secretariats. In the biodiversity cluster, two mutually supportive country-driven processes have addressed programmatic issues. The year 2021, they argue, is critical to explore synergies in the design of timebound objectives for the chemicals and waste and biodiversity clusters in conjunction with adoption of the "Post-2020 Global Biodiversity Framework" and the "Beyond-2020 Framework for Sound Management of Chemicals and Waste." Urho et al. (2019) consider that MEAs have not yet seized the full

potential of universal membership, and that coherent implementation could be pursued by adopting resolutions that address issues that cut across the conventions, clusters and themes, such as the chemicals-biodiversity interface, and by aligning better convention priorities in the programmes of work. Furthermore, they argue that, at an institutional level, formalizing the role of the governing bodies of MEAs in the sessions of the UNEA could be pursued by involving their respective presidents, bureaus or secretariats. The fiftieth anniversary of UNEP in 2022 provides an opportunity to solidify global environmental governance by increasing integration both in substance and institutional linkages (Urho et al. 2019). Thus, the UNEA could "fulfill its potential as a convener of all governments and of a growing number of engaged stakeholders in pursuance of sustainability and prosperity of the planet and its inhabitants" (Urho et al. 2019, p. 88).

Kim (2013) has applied Ostrom's polycentric systems approach to the overall structure and evolutionary dynamics of environmental treaty-making using network analysis, and used this as basis for guidance on possible clustering. Kim's argument is that "to the extent governance processes such as information sharing, learning, collaborating, and resolving conflicts are effective, multilateral environmental agreements can self-organize and function as a complex and adaptive, polycentric system" (Kim 2013, p. 988). Kim further contends that international environmental law has reached maturity as a complex system with adaptive capacity and a balance between centralized and decentralized control displaying a degree of institutional resilience. Based on this conclusion Kim argues that "the system as a whole is now at a stage where further institutional stresses may trigger abrupt, non-linear changes" that lead to a radically new system, and because of this, "...any reform options for global environmental governance should pay attention to the emergent polycentric order and complexity and what these features imply for the function of the multilateral environmental agreement system" (Kim 2013, pp. 985, 988).

GLOBAL PACT FOR THE ENVIRONMENT

The Global Pact for the Environment was an initiative for an international treaty to recognize the environmental rights and duties of citizens, states, and businesses. The first proposed text for a Pact was drafted in June 2017 by a network of over 100 environmental law experts from more than 40 countries. In May 2018, the UN General Assembly paved the way for its negotiation by adopting Resolution 72/277 "Towards a Global Pact for the Environment," which initiated an international process to address gaps in international environmental law and environment-related instruments (Aguila 2020). More generally, it was hoped that the process through an Open-Ended Working Group might help to strengthen the normative and governance system for meeting the challenges represented by environmental degradation in the context of sustainable development, but these hopes were setback during negotiations in Nairobi in May 2019 due to resistance by the US, Egypt, Brazil and Russia (Juste Ruiz 2020). It was decided only to recommend for states to adopt a "political declaration" in 2022 for the 50th anniversary of the Stockholm Conference (Aguila 2020). This was confirmed by the General Assembly in A/RES/73/333 of 30 August 2019 which makes no reference to the Global Pact, but simply confirms the status quo and calls for increased implementation.

INTERNATIONAL COURT FOR THE ENVIRONMENT

Pauwelyn (2005) has reviewed the need for a judicial mechanism for global environmental governance, in the form of an International Court for the Environment or World Environment Court, arguing that any system of law needs a judicial leg to adjudicate legal issues that increasingly appear on the international level.

The standard benefits linked to the rule of law can bring an end to violations (even by powerful players), he argues, and also enhance the predictability and further development of the law itself. The WTO and UNCLOS have judicial settlement procedures (Pauwelyn 2005).

Pauwelyn (2005) describes how at present, enforcement of international environmental law can be through the International Court of Justice (ICJ), which has universal jurisdiction, but is voluntary, and is only accessible to states; it created a Chamber for Environmental Matters in 1993 that has never been used. Moreover, the Permanent Court of Arbitration (PCA) has Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment (2001) which are voluntary. Similarly, the International Court of Environmental Arbitration and Conciliation (ICEAC) established by NGOs in 1994 is voluntary and has treated one case. Finally, he notes that the International Criminal Court (ICC) can prosecute individuals, but is limited to international crimes of genocide, crimes against humanity, war crimes, and aggression. Pauwelyn (2005) proposes that MEAs should have provisions for enforcement by domestic courts, as is the case within UNCLOS and the WTO.

Pauwelyn (2005, p. 159) stresses that what is still lacking is "a compulsory dispute resolution mechanism to which states, and possibly non-state actors, can automatically resort in order to enforce the myriad regulatory environmental treaties." At present, states are unwilling to grant such compulsory jurisdiction, so this is more likely to be created as part of a World Environment Organization with legislative, executive and judicial branches, and this would provide a much-needed bridge between decision-makers and the scientific community (Pauwelyn 2005).

Pauwelyn argues that features to be negotiated in the creation of such a court need to include its subject matter jurisdiction, its composition, who would have standing to bring a case and who can be sued, its power of judicial review, the applicable law, its capacity for independent fact-finding with a public prosecutor, its relations with other courts and international organizations, the binding effect of its judgements, actions in cases of non-compliance, and its financing (Pauwelyn 2005).[10]

Reform proposals for other institutions

WORLD TRADE ORGANIZATION

Various proposals we have reviewed have made frequent mention of the World Trade Organization (WTO) with a mandate to eliminate barriers to free trade, and intentionally kept outside of the UN system. This places it beyond the reach of global environmental governance in the UN context, and raises issues of its priorities. Sampson (2005) has explored the coherence between the global trade regime and the environment regime. While the WTO does not have formal environmental governance responsibilities, Sampson (2005, p. 126) points out that the WTO Agreement includes "the objective of sustainable development and that of 'seeking both to protect and preserve the environment'." He further contends that the principle of non-discrimination "underpins the rules-based multilateral trading system," but WTO members have "agreed to restrictions on trade in endangered species, living modified organisms, stolen goods, narcotics and many other products" (Sampson 2005, pp. 128, 129). Moreover, Sampson describes how there is overlap with environmental agreements in the areas of settlement of disputes, precaution and risk assessment and management, with potential rulings on exceptions to WTO obligations taken for environmental purposes, and that there is a particular difficulty in its ban on discrimination based on production methods, which prevents states from regulating the import of products produced in environmentally or socially damaging ways. The WTO is deciding scientific issues

such as carcinogenicity, adopts policies concerning the acceptable levels of risk or scientific uncertainty, and makes decisions about appropriate levels of health and safety, in the absence of outside negotiations and regulations (Sampson 2005). This means, argues Sampson, that there needs to be a coherent approach, perhaps including a consultative process, to deal with problems where scientific evidence alone does not make the policy choices clear. The WTO has been an environmental obstacle, is not transparent, with no NGO input, and Sampson proposes that the WTO Committee on Trade and Environment (1995) could debate environmental aspects of negotiations, and the WTO should adopt standards and trade measures agreed in MEAs (Sampson 2005).

REFORMED TRUSTEESHIP COUNCIL

The UN Trusteeship Council is a major organ in the UN, but has no purpose, since all the territories under trusteeship since 1945 have become independent or chosen other relationships. There have been periodic proposals to reform it to be responsible for the global commons in trust for all humanity, including by the UN Secretary-General. Redgwell (2005) has reviewed these proposals.

A key element of the proposal, according to Redgwell, is that an Environmental Trusteeship Council would have oversight of the global commons and the state of the environment within countries, which is the common concern of humankind. While there is no sovereignty in trusteeship functions, Redgwell describes some precedents for this kind of function that might legitimize international interest in the conservation of biological resources within State territorial sovereignty. Collective trusteeship would be exercised to ensure that states and international treaty institutions responsible for protecting and conserving the global environment within and beyond states fulfil their obligations for the benefit of present and future generations (Redgwell 2005). Redgwell describes general proposals, including ombudspeople and NGOs or individuals speaking for future generations, and design features of a revamped Council such as oversight of treaty instruments and obligations (gaps and overlaps), and a petition mechanism for present and future generations. She concludes, however, that the major challenge is that such reforms would require revision of the UN Charter, and such proposals have always failed (Redgwell 2005).

UN SECURITY COUNCIL

One of the more radical proposals is to expand the mandate of the United Nations Security Council (Elliot 2005). In her proposal, Elliot argues that environmental degradation is now widely accepted as a possible threat to state security, to human security and to international peace and security. Therefore, pursuit of peace and security in the 21st Century should include "preventing deadly conflict, strengthening the centrality of international humanitarian law, targeting sanctions and strengthening peace operations" (Elliot 2005, p. 205). Such a framework would enable the Council to take on the mandate "to address the environmental causes and consequences of conflict and to contribute to international environmental governance" (Elliot 2005, p. 205). Elliot describes how the concept of environmental security has emerged since the 1980s, and that even the Council itself in a communiqué from 1992 declared that "nonmilitary sources of instability in the economic, social, humanitarian and ecological fields have become threats to the peace and security" (Elliot 2005, p. 208).

Elliot discusses options for a Security Council mandate. She stresses that environmental degradation or resource depletion and the resulting violence or armed conflict could constitute a gross abuse of human rights, but human rights law does not yet recognize a human right to a clean and safe environment. Further-

more, environmental threats to peace and security could call for the use of force to compel compliance with environmental agreements, based on the state right of self-defence, but environmental threats to security are hard to define, and the legal and normative grounds are still quite shaky (Elliot 2005).

Elliot (2005, p. 219) concludes that Security Council reform could contribute to international environmental governance through "action to enforce the environmental dimensions of international humanitarian law,... the potential imposition of economic or other sanctions in response to severe 'environmental delinquencies,... environmental conflict prevention and preventive diplomacy,... support to... sustainable development and environmental protection in post-conflict peace-building and social reconstruction," and "environmental guidelines in the rules of engagement and deployment for UN-mandated forces" (Elliot 2005, p. 219).

GLOBAL RESILIENCE COUNCIL

The Foundation for Global Governance and Sustainability (FOGGS) has recently proposed the creation of a Global Resilience Council (2020) based on the argument that the "UN system lacks an operational body that can effectively deliberate and act on non-military global threats." Whether in responding to the COVID-19 pandemic, climate change or food insecurity, "there is no equivalent body to the UN Security Council with mandatory authority to guide the response of the international community to a wide range of global non-armed-conflict-based crises" (FOGGS 2020, p. 1). The foundation argues that this need could be met by creating a new Global Resilience Council which "could be a body central to the entire UN system, scaling up the issues in importance and in terms of their interconnections from the level of individual specialised bodies to the global community at large, while promoting concerted action cutting across sectoral agendas" (FOGGS 2020, p. 2). Such a body "would be responsible for ensuring the resilience of individuals and communities vis-à-vis soft security risks" and enforcement tools would include directed cross-organizational action, economic tools, public engagement, criminal and liability referrals, standards pre-emption, and fact-finding and preventive measures (FOGGS 2020, p. 2)

2). The Council could have state and non-state membership (FOGGS 2020).

Climate change defining a broader view of governance

The complexity of climate change as an environmental problem for which we all, particularly the affluent, are responsible, and requiring the transformation of the whole basis for material civilization, requires a much broader view of environmental governance. Jänicke (2017) and Coen et al. (2020) consider the multi-level system of global climate governance as a model to achieve a broad global mobilization of different actors "with its own inherent logic, dynamics and stabilization mechanisms," offering "opportunities for ambitious innovation-based climate strategies," where "each level of the global system has its own specific responsibilities, challenges, opportunities and mechanisms for lesson-drawing" (Jänicke 2017, p. 108). Their model resembles Ostrom's polycentric systems characterized by multiple governing authorities at differing scales to address global collective action problems (Ostrom 2014). Jänicke proposes that such a model provides many access points, interlinkages and experiences, as well as incentives for bottom-up harmonization of best practices and top-down initiatives, with the potential for horizontal dynamics, reinforced innovation, and peer-to-peer learning (Jänicke 2017, p. 111).

Abbot (2012) assesses the complex, fragmented, and decentralized accumulation of transnational institutions, rules, standards, financing arrangements, programs and operational activities as an array of transnational regimes requiring a polycentric approach, where "responsibilities for tasks such as adopting rules and funding public goods are shared among multiple organizations that have diverse memberships and operate at different scales. It is also decentralized" and involves non-state actors (Abbott 2012, p. 571). He argues that the benefits of decentralization could be maximized, and the costs minimized, through modest forms of coordination or orchestration, to support and steer transnational schemes that further global public interests, and such a function could appropriately be performed by an international organization such as UNEP. Because orchestration is a light and non-hierarchical form of coordination mechanism, UNEP could perform this function by providing support for a variety of organizations and governance schemes through, for example, incentives and persuasion (Abbott 2012). He supports the idea of others that UNEP could facilitate learning by establishing a clearinghouse for transnational schemes by evaluating their structures and operations and sharing the knowledge that is generated. He even suggests to go further, enabling UNEP to "promote experimentation, supporting different types of transnational schemes, standards, and programs, assessing their results, promoting peer review, diffusing knowledge about them, and helping to replicate or scale up transferable innovations" (Abbott 2012, p. 588).

With the challenge of implementation and accountability a major preoccupation, Gunfaus and Waisman (2021) have assessed the adequacy of the global response to the Paris Agreement, and propose strategies to strengthen the ability of global assessments to progressively increase collective ambition and action. One suggested strategy is a "sectoral systems approach…" that "… enables the operationalization of multidimensional adequacy assessments" (Gunfaus and Waisman 2021, p. 1). The authors also find that improving the integration of multiple levels of governance and short- and long-term time horizons is necessary. They further argue that an "adequate level of ambition needs also to take into account local realities across the regions of the world and across each of a range of sectors, while exploiting opportunities of international cooperation" (Gunfaus and Waisman 2021, p. 2).

A framework for assessing the adequacy of ambition levels needs to include "a sectoral approach to inform the economy-wide picture (sector granularity); a long-term perspective to inform short-term decisions (temporal alignment); and a country-driven vision to inform the global picture (multi-level alignment)" (Gunfaus and Waisman 2021, p. 2). Furthermore, Gunfaus and Waisman (2021, p. 4) argue that an "assessment of the adequate governance response should not be limited to a forward-looking gradual institutional reform" but should "imagine what the institutional landscape of a decarbonized world could be to enable the necessary structural transformations over time and to address their social and economic implications across geographies."

Woolley (2020) has analysed the international climate change regime from an ecological perspective. Despite commitments of the parties to preserve ecosystem functionality in their collective response to global warming, little attention has been given to the appropriateness of the established legal framework for achieving their stated ecological goals. Woolley highlights that the Paris Agreement's provisions could be used to promote ecosystem preservation as an outcome. But in order to do so a climate treaty needs to address the following key characteristics: mitigate climate change by reference to anticipated effects on ecosystems; respond to catastrophic threats with due urgency; alleviate pressures on, and bolster resilience of ecosystems; reduce pressures on ecosystems from all sources

with equal urgency; assist parties to move socio-economic systems toward more sustainability; equitability in mitigation/adaptation action with poverty reduction; and careful definition of grounds for derogations. There is a need to go from aspirational to detailed practical actions, and to address both adaptation and mitigation (Woolley 2020, p. 83).

Broader system reform

Alongside these efforts specifically addressing intergovernmental environmental or climate change governance, there has been a wide range of proposals for broader reform of the international system, with the environment as just one component.

As part of general proposals for reform of the United Nations System, including legislative, executive and judicial capacities for effective global governance for the 21st Century, Lopez-Claros, Dahl and Groff (2020, p. 365) propose reinforced global environmental governance consolidating the many fragmented parts of the present system, including possibly a Global Pact for the Environment to summarise international environmental law, and an environmental organization able to create a binding global legal framework for those areas, resources, planetary processes and biogeochemical cycles that are essential to maintaining a planetary system conducive to human life and well-being as the common property of humankind managed as a condominium. The authors suggest that this "requires coordinated and sustained research, monitoring and scientific advisory procedures appropriate to each environmental process, with structures for multilevel governance" (Lopez-Claros, Dahl, and Groff 2020, p. 365). They further argue that climate change is recognized as a priority that might pioneer this approach through a UN Climate Change Organization, responsible not only for emissions of greenhouse gases but managing climate-induced migration, climate impacts on nature and food production, ocean acidification, the energy transition, and technology assessment of proposed solutions. This integrated approach, they suggest, could then be extended to other aspects of planetary sustainability including biosphere integrity, chemicals and waste management, the atmosphere, and globally-coordinated natural resources management. It would enable the gradual consolidation and integration of the present fragmented international environmental legislation and its effective implementation (Lopez-Claros, Dahl, and Groff 2020).

In their general review of reforming international environmental governance options across the whole UN system, Chambers and Green (2005) highlight the disjunction between lofty intensions in the international environmental policy space, versus outcome-focussed missions, and the need for mechanisms with enough legitimacy and authority to set policy priorities. Some lessons learned from their in-depth examination of all institutions of sustainable development governance are that institutions must match the scale of the systems, proposals for institutional changes should use a systematic approach, and an agenda for reform should aim for coherence, centralization and compliance. They note the "persisting high level of disagreement about what would constitute an effective and appropriate approach to achieving sustainable development," especially between developed and developing countries, which means that these disparities have to be reduced (Chambers and Green 2005).

ENHANCING INTEGRATION

Given the fragmented and horizontal structure of the environmental governance system, the goal should really be environmental policy integration among international institutions. Oberthür (2009), proposes using tools of interplay management as a means to achieve strong policy integration and overcome the

lack of systematic and consistent support for integration among international environmental institutions. He advocates promoting inter-institutional learning and assistance as well as requiring that institutions respect and give priority to objectives enshrined in environmental institutions. Adjusting the statutes and mandates of individual institutions and developing suitable advice under general international environmental law, Oberthür further suggests, should be the most promising approach. This could be supplemented by joint management initiatives and a strengthened international environmental organisation, which could, for example, identify potentials for broader inter-institutional learning and assistance, and assist in developing general rules of international environmental law (Oberthür 2009).

LEGISLATIVE REFORM

Kotzé (2019) argues that international law has failed to address the ever-deepening socio-ecological crisis of the Anthropocene. International environmental law, he maintains, "has become incapable of, and inappropriate for, addressing this crisis, and is unable to respond to the Anthropocene's regulatory demands" (Kotzé 2019, p. 1). Regulation of the Earth system requires inclusivity, interdependencies and complexity according to Kotzé, and he suggests that law should be reformed to create a new Earth system-oriented legal paradigm called Earth system law (Kotzé 2019).

Mauerhofer (2019) summarizes some legal principles from the extensive field of ecological economics, involving priority setting between environmental, social and economic dimensions within sustainable development. He proposes as the two main objectives for improving international environmental law: to stay within the ecologically sustainable planetary limits, and to legally define flexible trade-off mechanisms which deal better with conflicts of interests among the three sustainability dimensions. Mauerhofer maintains that there are potential innovative mechanisms within existing international law that could overcome current implementation and enforcement deadlocks. Incentives can focus on rules and thus be enforceable, on economic incentives, and on information (Mauerhofer 2019). Existing law can be improved across competing interests, and address scale or carrying capacity, and there is potential within the MEAs to use voluntary approaches, capacity building about direct effects, extending geographic application, and reinterpretation of the law on a more scientifically sound basis (Mauerhofer 2019).

REFORMING THE ECONOMIC SYSTEM

Given that the present economic system drives many forces for environmental destruction, from greenhouse gas emissions and over-exploitation of natural resources to wastes and dangerous chemicals, it is logical to consider how combining global governance and reform of the economic system could contribute to more effective environmental governance. We will only give one illustrative example here, developed further in **Appendix 2**.

Based on his critique of neo-classical economic theory resulting in market failure in areas such as climate change, Anderson (2012) shows that environmental sustainability will not be served by introducing or extending market approaches, but by expanding and supporting public approaches—substantively and procedurally—recognizing values, persons, and environments, with people arriving at public judgements about what is of value, including common concern and responsibility, prevention, and precaution. This would require the removal of market instruments and norms from areas for which they are not appropriate (Anderson 2012).

Since reducing global resource use to stay within planetary boundaries implies questions of the legitimate distribution of economic benefits and harms, who then

decides what resources should be used and for what purposes? Anderson finds it necessary to consider the distribution of power as an *object* of justice, *standing* for people as participants in, rather than merely recipients of, justice, and *criteria* giving people a right to define and to determine that distribution, involving both corrective and distributive justice issues. This has implications for environmental governance. He argues that some form of deliberative democracy can provide *procedural rights* to recognize varieties of individual and common good as what people care for, and to encourage wiser resource-use decisions through broader participation. This could address the weaknesses that come from the divorce of questions of value and consensus from those of power and social conflict. Although procedural rights may incentivize sustainable outcomes, *substantive rights* are also required including the domestic as well as international effects of the precautionary principle and the incipient human right to a clean and healthy environment (Anderson 2012).

Anderson argues that reform of environmental governance must also address the problem with economic practice that allocates natural resource use according to the rate of return rather than the rate of resource replenishment, which price correction appears incapable of resolving. Harmful pressures and incentives follow from state reliance on economic growth, and are subject to lobbying from vested interests in maintaining growth, limiting meaningful collective state action. Today, many key resources are owned by private corporations with rights, powers, and immunities comparable to governments, facilitating their excessive or dominating influence and often replacement of more competitive markets. International environmental law would need to reform the allocation of the control of natural resources, removing the use of productive resources according to the profit motive or their distribution according to a price mechanism, and replacing this with collective decision-making criteria which, for economics, distribute the benefits and necessary harms from production in ways that generate the highest net social gain (Anderson 2012). Such reforms could privilege public rather than private interest in collective key resource decision-making, such as by re-allocating resource control, including credit, in a manner that avoids both collective-action problems and amplification from competition and privately created credit; and recognizing standing to empower human agency and correspondingly curtailing concentrations of power (such as those currently held by private corporations) (Anderson 2012).

This example, while radical from the perspective of traditional economic thinking, illustrates some fundamental questions that may need to be addressed in considering the efficacy and design of an institution for global environmental governance, which may need to contribute to the fundamental transformation of our economic system.

5. Design proposals for a Global Environment Agency

The urgency of a more effective response to the interlocked global environmental crises of climate change, biodiversity collapse, chronic pollution and the erosion of the natural resource base supporting human life on this planet – logically – would seem to require a Global Environment Agency (GEA) or equivalent institution, as many have argued before us, to strengthen the currently weak and fragmentary institutional landscape at the global level which is not delivering the intended results. Creating a new level of governance responsibility requires building the trust of governments, which is part of building global trust more generally across states, peoples and cultures. This is a complex challenge alongside building a culture of the rule of international law and the operation of justice at the global level.

In this section, we formulate concrete proposals for the core elements of what we suggest a GEA would need to look like to deliver on fundamental global environmental governance goals. This proposed ideal design draws on the application of the principle of subsidiarity (see **section 2**) to each of the functions we identified above (see **section 3**) as necessary to address global environmental risks, the analysis of what is missing in these functions currently, and earlier reform proposals (see **section 4**). We have also added our own proposals where we discovered gaps. We have, however, in the following text not provided academic references to proposals made by others before us, largely mentioned already in **section 4**, to make the text more readable and policy relevant. Moreover, there are often a number of authors who have made similar suggestions with some variations, making it difficult to attribute who suggested what first. When applying subsidiarity, we focus on the procedural component that aims to ensure effective governance, thus assigning governance to the global level when lower levels *do not have capacity* to act *or are not willing* to act. The legitimacy aspect is as important and is also considered in various places below. The general starting point for our suggestions is today's extremely weak and ineffective governance in relation to the set of serious global environmental risks currently confronting the international community.

A. The knowledge provision function of a GEA

We described above in section 3 the importance of a GEA being able to provide the knowledge required to address global environmental risks, with the capacity to generate knowledge, to collect and assess available knowledge, and to provide advice to policy makers. We also described in that section how this is linked to three other core functions, including to the ability of the governance system to deliberate and take good decisions and indeed to be reflexive and adjust their decisions as the environment requires and learning is built up. This knowledge provision function is already high on the agenda of global institutions. Further, there are many important elements of the four subfunctions already in place and thus there is much to build on to raise the provision to sufficient levels. Our proposals are listed below by sub-function, as set out above in **Section 3A**.

I. GENERATING KNOWLEDGE

The GEA needs to ensure there is sufficient and appropriate *monitoring and research* on the various crucial elements of the interconnected global social-ecological systems.

The monitoring of the earth's environment is currently relatively well organised through the intergovernmental Group on Earth Observations (GEO) that provides a coordinated and steadily-improving flow of space-based and ground-based observations of the planetary environment. However, there is a gap in the social sciences, requiring research on the human impacts of environmental problems and the effectiveness of policy and management measures.

To ensure sufficient and appropriate monitoring is carried out we propose the following:

- Connect earth observation systems with participatory observations including from indigenous and local communities and citizens in general.
- Create a trust fund to build capacity in developing country research communities on earth observation.
- Expand the scope of UNEP's GEO assessment process to include monitoring the direct and indirect drivers for environmental risk in social and economic systems across the globe, collecting information from the UN System and setting up new monitoring programs as needed.

To ensure that sufficient and appropriate research is generated, the GEA needs to be supported by a:

Global Research Council with transdisciplinary experts, selected by e.g., the International Science Council, integrating natural and social sciences, and independent from governments. The Research Council should:

- Have a budget adequate to fund research on emerging global environmental problems, including issuing research calls on knowledge gaps identified by global environmental assessments.
- Identify what data are meaningful, and ensure the long-term continuity of data collection to develop time series for dynamics of environmental change.
- Provide research funds for comprehensive globally comparative research on the effectiveness of different policy measures in diverse contexts.
- Have a rapid response capacity to fill urgent research needs on possible tipping points.
- Study complex interactions between different parameters of the Earth system, for example through supporting the ability to model the whole global system.
- Provide mechanisms for building research capacity around the world on global problems.

II. COLLECTING AND ASSESSING AVAILABLE KNOWLEDGE

The GEA needs to ensure that available knowledge, from scientific and other sources, is collected and assessed as the basis for identifying research gaps and providing policy relevant knowledge to decision-makers across levels including the global level. Too many of the present assessment processes are in silos, as with the IPCC on climate and IPBES on biodiversity, are poorly funded and not independent from political issues. They need to be better orchestrated.

To ensure a proper assessment function we suggest that the GEA:

- Bring the various established assessment processes (IPCC, IPBES, Global Environment Outlook) under a joint administrative home facilitating consolidation and filling thematic gaps.
- Gradually replace the consensus principle governing assessments by majority voting to reduce the political influence of obstructing countries.
- Link assessments explicitly to serve a set of global decision-making arenas,

such as IPBES assessments serving all biodiversity related MEAs.
- Coordinate the global assessments with regional and national assessments to form a system of polycentric assessment processes.
- Have a synthesis and foresight capacity and an expert science-policy platform like UNEP's International Resource Panel that can advise the Global Research Council on priorities for new research.

III. DISSEMINATING KNOWLEDGE

The GEA needs to play a role in widely disseminating to the general public knowledge relevant to global environmental risks – primarily the system level knowledge about the global commons - coming out of the globally funded research and assessments. The GEA needs to complement the efforts of knowledge dissemination when states have no capacity or interest to share this with their citizens.

To be able to disseminate relevant knowledge the GEA should:

- Develop multiple channels of communication to keep the world informed of the state of the planetary environment, trends requiring action, and the results of management efforts. It can build on the experience, for example, from UNEP with its Global Environment Outlook (GEO) reports and foresight processes, and the experience on a regional level of the European Environment Agency.
- Develop appropriate indicators as communication tools, building on existing indicators used for tracking global goals and adding others for issues not already well covered.

IV. SCIENCE ADVICE

The GEA needs to ensure that policy-makers, particularly at the global level, have access to knowledge-based advice that draws on the generation and assessment of knowledge. The GEA will need the competence to adapt the relevant knowledge into forms accessible to the policy-makers in each of its target audiences: parts of the UN system, MEAs, other international and regional organizations, states, economic actors and the diversity of civil society and non-governmental organizations.

To ensure the science advice function of the GEA is effective and legitimate, the GEA should:

- Serve as the orchestrator in a polynodal scientific advisory system networking what already exists and creating new mechanisms where necessary to fill gaps and to provide an integrated overview of the planetary system for top-level decision-making in the UN Environment Assembly, the UN General Assembly and whatever successor structures are created.
- Provide the mandate for assessments to provide more guidance on what type and range of policy options and regulations are needed, particularly at the global level, for achieving the adopted global environmental policy goals.
- Ensure, in collaboration with states, that resources are available for science advisory capacity at global and national levels when that is not the case.
- Establish a close working relationship with the International Science Council – the international umbrella for science.

B. Deliberative and legislative functions of a GEA

At the heart of the GEA must be the function to deliberate, legislate and more broadly take decisions. We have described the progress states have made in negotiating (with aspects of deliberation) and agreeing on future goals and rules (including legally binding ones) that should constrain their behaviour. This is a foundation to build on when ensuring that significant gaps are addressed.
In its deliberative and legislative roles, the GEA should:

- Apply rules and practices that enable more authentic deliberation, for example to be:
  - explicitly focused on the global common good (beyond national interests), including equity and "leaving no one behind" (as affirmed in the 2030 Agenda);
  - openly explained with reasons and mutual justification;
  - open to the voices of all those potentially affected, for example through participation in the pre-decision phase by civil society, parliamentarians and other stakeholders;
  - based on participants speaking truthfully, with exclusion for obvious lies or distortion of facts;
  - respectful of all participants.
- Build in regular processes of meta-deliberation – deliberating on the effectiveness and legitimacy of the GEA itself in responding to global environmental risk – making constitutional and rule reforms easier yet with safeguards for backsliding.
- Allow decision-making based on majorities varying with the issue, based on subsidiarity, or when requiring referral to other bodies.
- Have authority to liaise with other parts of the UN system to negotiate appropriate enforcement tools for countries that are blatantly failing in compliance that is within their capacity, or which chose to stay outside MEAs.
- Complete the adoption of a 'treaty of treaties' establishing the fundamental principles of international environmental law, building on the draft Global Pact for the Environment and Earth Charter.
- Be mandated to consolidate MEAs, initially clustering MEAs that are closely related, and over time integrating them, including treaty texts, reporting obligations, facilitative and enforcement branches, follow-up mechanisms, administrative support systems, and capacity building roles.

C. Enabling and implementing functions of a GEA

A GEA cannot do everything, but should orchestrate the many parts of the global system for environmental management, enabling each part to carry out its functions in a coherent global strategy, while allowing considerable diversity in approaches and measures regionally, nationally and locally. There are of course specific functions inherent to global action to be implemented directly by the GEA, requiring significantly increased resources.

In its enabling and implementing role, the GEA should:

- Systematically support, orchestrate, coordinate and continuously evaluate international collaboration in various sectors and forums including public, multistakeholder and public-private partnerships.

- Provide or identify funding sources for supportive measures in environmental management (including implementing MEAs), with a special focus on countries needing most support.
- Have sufficient human and financial resources to support capacity building and other enabling activities in countries that so request, and to evaluate their effectiveness.
- Assist developed as well as developing countries with their challenges of implementing MEAs and more generally environmental management, supporting reciprocal learning programmes to build trust and mutual understanding for each other's difficulties.
- Create mechanisms to give civil society a role in monitoring compliance.
- Prepare regular reports on country implementation and compliance with their environmental responsibilities.
- Assist international institutions in areas such as trade and finance to incorporate environmental responsibilities into their statutes.
- Build capacity to administer a consolidated set of MEAs.
- Maintain a secretariat with staff and financial resources adequate to all its functions and with a capacity to provide technical support to countries as needed.

D. Trust and justice building functions at the heart of a GEA

A GEA must address one of the basic weaknesses of international governance, failures of trust, by becoming trustworthy itself and laying the foundation for more trust between governments.

Since compliance is a necessary requirement for trust, the GEA must ensure that there are robust compliance mechanisms in place that cater both for those states needing support and capacity for complying and those states needing additional incentives (rewards or sanctions) to comply. The GEA must also have the necessary accountability mechanisms for its secretariat and operative parts.

In its trust and justice-building function, the GEA should:

- Create, or be able to refer to, an independent audit agency to review and report on how its components, partners and executing bodies are functioning, so it can then design solutions if necessary.
- Institutionalize internal mechanisms for ensuring accountability of the Secretariat and operations building on principles of participation, transparency and evaluation and including complaint & response measures.11
- Focus on SDG16 and other normative documents to build a broad culture of the rule of international law.
- Create and maintain a web portal of legal provisions of MEAs, international environmental norms, and relevant case law, as a step towards eventual codification
- Develop and consolidate implementation and compliance mechanisms for the MEAs that it administers (see above).
- Develop mechanisms for financial and technical assistance as needed for states that are at risk of non-compliance.
- Create or refer cases of conflicts between states arising from MEA implementation to dispute settlement mechanisms, starting with negotiation and arbitration, utilizing such mechanisms where they already exist.
- Explore if there is a need for a judicial system specialised in environmental matters such as an International Court for the Environment.

- Consider an overarching framework for environmental law, such as a Vienna Convention for environmental agreements, drawing on efforts such as the Earth Charter and the Global Pact for the Environment.
- Provide expert advice on scientific and technical issues before international tribunals (and national ones when so requested) as necessary.
- Work to grant standing to competent civil society organizations to present their observations to compliance committees and during disputes before judicial bodies, and to bring actions before international environmental judicial systems.

E. Learning and reflexivity in a GEA

Most mandates of international institutions do not explicitly include or enable learning, yet learning across institutions is essential in times of rapid environmental change, requiring the capability to listen to the Earth, rethink core values and adapt governance accordingly (i.e., "ecological reflexivity"). Since existing environmental assessment processes operate on cycles of several years, an early warning mechanism is needed. The GEA should, as part of its orchestration of the polycentric assessment and governance processes, facilitate learning and reflexivity across the system by sharing both good practices and the lessons learned from inevitable failures (which now are too often covered up rather than seen as opportunities for improvement).

To learn rapidly what is changing in the global environmental system that requires action, and what actions would be most helpful to mitigate and adapt to them, the GEA should:

- Ensure the rapid flow of information on unexpected changes up to the GEA for assessment.
- Organize expert groups to evaluate the data and to propose policy responses.
- Communicate warnings and response alternatives to the appropriate decision-making bodies.

To increase reflexivity in the governance system, the GEA should:

- Promote more systematic and consistent interactions for inter-institutional learning between all components of the system including specialized agencies, MEAs and assessment processes.
- Set up mechanisms to enable the recognition of unanticipated impacts between social and ecological processes.
- Use its proposed deliberation functions to rethink core values beyond short-term self-interest and to question practices relevant to damaging impacts.
- Provide guidance to other nodes in the system on collaborative adaptation and institutional reform.

F. Institutional specifications for a GEA

The review of the many existing institutions of international environmental governance and proposals for their reform suggests an appropriate way forward to design a GEA. This should build on what already exists (UNEP), but would involve neither simple reform within its present mandate nor upgrading to a specialized agency. A new role is required - that of orchestration in polynodal or polycentric systems. This would be more than a simple catalytic or coordination function, and would rather entail a central authority accepted by other parts of system, setting the global rules, norms and values for the common good of the planetary

environment and the right to a clean, safe, productive human environment. This would allow the GEA to overcome institutional turf wars and barriers in a spirit of positive collaboration.

The Global Environment Agency at the heart of this polycentric system would consist of:

- the secretariat with many of the present functions of UNEP for science, management, law and reporting, but with greater global authority and capacity;
- adequate independent funding from global sources, as discussed in the separate paper by Augusto Lopez-Claros;[12]
- the legislative function starting with new voting rules in the UN Environment Assembly, adding the capacity to deliberate on and adopt binding legislation in clearly defined areas of competence, able to integrate legislation necessary for all the global environmental commons and dimensions of the biospheric system;[13]
- an advisory Civil Society Chamber to the UN Environment Assembly would ensure wide input to the deliberative process;
- input to the UN System Chief Executives Board for Coordination, to ensure greater coherence in the UN system in implementing GEA decisions;
- an umbrella for MEA secretariats without requiring an immediate co-location, while working through the inevitably painful process of evolving from an independent convention paradigm to a single global legislative process for environmental law;
- a judicial function such as a Court of the Environment, building on what already exists, but with binding jurisdiction;
- oversight for increasing coherence in the regional dimension of governance, consolidating the environmental actions of the UN Economic Commissions, UNEP Regional Offices, and related structures, just as with the One UN process at the country level, while assuring coherence across levels.

One helpful example of a productive inter-institutional linkage from the regional level is the relationship of the European Environment Agency and the European Commission.

Everyone working for the GEA should receive training in ethical leadership, the values of the organization and in general the standards expected of the international civil service. Lopez-Claros et al. (2020) devote a whole chapter to values and principles for good governance in a modernized global governance system. In addition, training may be needed in systems thinking, transdisciplinary communication and other skills necessary for the unique role of a GEA which may not be provided sufficiently in traditional education.

6. Ways forward

Given the difficulties in achieving much global environmental governance reform over the last half century, we propose both a long-term strategy aimed at creating the fully functional and effective Global Environment Agency envisaged in this report, and some short-term actions – both general and specifically for climate change that we propose is a suitable 'pilot' – that could be pursued immediately if coalitions of the willing can be found. In some cases, these coalitions can, to start, consist of primarily non-state actors including scientists, think-tanks, civil society organizations or multistakeholder partnerships that can engage in providing knowledge, encouraging deliberations, building resources and, not the least, advocating with governments. In other cases, coalitions of willing governments can be formed in the early stages. One significant advantage of promoting reform now is the growing global awareness that 'business as usual' is untenable considering the grave risks for people and planet, and that a fundamental societal transformation is necessary. Governments have already laid out the important goals for the path ahead with the 2030 Sustainable Development Goals, and the Paris Agreement on Climate Change, and are preparing to adopt new biodiversity goals for 2030 under the Convention on Biological Diversity. Considering the developments in civil society movements in recent years, and emerging support from national courts to demand that governments increase their implementation of international commitments, pressure for change will only increase. At some point a breakthrough becomes possible.

Long term

Ideally, the GEA could be implemented as part of general global governance reform as proposed by Lopez-Claros et al. (2020). However, the retreat from multilateralism and the resurgence of geopolitics in the second decade of the 21st Century suggest that progress will be difficult unless precipitated by some major crisis. Every effort should therefore be made to prepare and put in place as many elements of more competent global environmental governance as possible, even at a pilot demonstration scale, to facilitate further progress when the opportunities arise.

Building from UNEP to a GEA should be planned as an institutional evolution, as the means become available and the different functions are strengthened. This would be more than a Programme, but without the heavy administrative machinery of a Specialized Agency - rather focussing on the capacity for global legislation on specific environmental challenges and assisting governments to comply. It should have universal membership and allow decision making with different degrees of majority. It should have a significantly increased and stable source of core funding. Its creation should be a participatory process based on widespread deliberation and the transparent decision-making necessary to build trust in its authority. Current UN institutions would need to accept some institutional creativity to integrate such a new institutional mechanism into the existing system.

The UNEP leadership should first be consulted, and proposals for various steps of reform prepared for the Committee of Permanent Representatives, and then the UNEA. Sources of funding should be put in place both for the reform process and for the strengthened functions. First, priority should be given to those functions that do not require major institutional innovation. The steps towards the new institution should be mapped out, and the process to negotiate and

implement them has to be agreed by the UNEA and the UN General Assembly. Non-state actors and supportive states can form a coalition that identifies the reasons for major obstacles and resistance from certain governments and enables deliberation about them.

The knowledge and science provision function can advance without universal state participation, for example by first setting up a Global Science Council as an independent institution outside the UN System. Measures for strengthening and expanding the scope of existing scientific advisory bodies and providing adequate funding could to a certain extent be done without all states' support, such as through earmarked funds. Expanded mandates, however, currently require consensus but could be achieved if they are seen as helpful for all countries. The learning and reflexivity function as described in this report could be incorporated into all existing mechanisms, bringing in new types of expertise, creating opportunities for (deep) reflection and re-thinking, and making mandates for learning explicit. Strengthening both these functions would help to build strong arguments and broader understanding for better global governance.

In the preparation of the GEA, and as one of its functions, there should be a process of 'meta-deliberation' (see discussion above), or deliberation on the existing governance system itself, exploring failures of the system and possibilities for reform. Various types of deliberation processes could be used for this, and these could be identified by learning from existing deliberation practices in various cultures, like the Talanoa approach in the Pacific or randomly selected citizen panels that have been tried in various countries.[14] It is important that such deliberations take place widely across the globe involving also local and national communities, not only those active in existing global governance policy spheres. The GEA needs to be seen as legitimate not only by states but by 'we the peoples' of the world. These ideas could be piloted for the climate regime (see below).

Ultimately the extended authority for the GEA should be confirmed globally in a constitutional convention or UN Charter revision conference. An intermediate step would be the creation of a World Parliamentary Assembly, and/or a Civil Society Chamber advisory to the General Assembly, which would be important arenas for the meta-deliberation that we suggest (Lopez-Claros, Dahl, and Groff 2020).

Short term

If the present discussion of revitalization or reform in the United Nations linked to the 75th anniversary of the UN in 2020 leads to significant progress, then creating a GEA could be addressed as part of that process. Otherwise, the priority should be to work towards transforming UNEP into a (global) UN Environment Agency as proposed above. The central arena for deliberating on reforming UNEP is obviously in the UN Environment Assembly. This would require one or ideally more member states putting it on the agenda and, perhaps with the support of favourable civil society coalitions, preparing studies and proposals that could provide the foundation for such a meta deliberation about the effectiveness of the governance system itself.

The events around Stockholm+50 in 2022 can provide good opportunities to discuss global environmental governance reform in and around an intergovernmental setting as the anniversary should, if used well, be used to reflect on the effectiveness of UNEP set up fifty years ago. If such discussions are constrained by unwilling countries, it is all the more important that the scientific community, civil society and interested states use the moment to explore the issue from various angles. Other political 'moments' in the near future that could be used by transnational coalitions to stimulate such meta deliberation and push for con-

crete proposals on the agenda is around the 2023 global stocktake under the Paris Agreement (which will establish how far the world is from the Agreement's goal), and the 2025 assessment of progress on the SDGs.

Among the concrete proposals that transnational coalitions (including states, civil society, etc.) could put on the table at these political moments are:

- For UNEA to take the first step beyond the consensus/consent rule, replacing it with various possible formulae: overriding a single dissenter, or requiring 90, 80, or 51% of votes to pass certain decisions. Other formulae and possible models for more equitable decision-making in key international bodies (e.g. the UN General Assembly and Security Council) are discussed in Lopez-Claros et al. (2020).
- Launch a campaign to increase the levels of human and financial resources for the scientific capacities and advisory processes in UNESCO, UNEP, FAO, WMO, etc., and at the regional level needed to deliver on their present mandates.
- Explore all options to strengthen implementation of existing MEAs and soft laws within existing mandates, rather than redesigning them, and engage in regular deep evaluation of their effectiveness to affect state behaviour and achieve their goals.
- Promote an assessment of what has been learned from including environmental rights and the rights of the environment in constitutions at the national level, that could contribute to including such rights in a global environmental charter or constitution.
- Exploit opportunities for multi-layered accountability pathways holding states to account for their international obligations that are more powerful at the national level, building capacity in parliaments, audit agencies, the media, and civil society organizations to track implementation of international obligations (legal and non-legal).[15]
- Explore with some simple initiatives how environmental obligations can be enforced by existing parts of the international judicial system.
- Raise a discussion on what emergency measures (with rapid decision-making and implementation), and in which institutional setting, could be put in place where resource depletion is near and potentially catastrophic.

Initial focus on Climate Change

Climate change, due to the urgency of radically stepping up action to avoid unacceptable levels of risk for run-away climate change, could be the issue where the strengthening of the five necessary functions we have laid out could be pioneered. The adoption of the Paris Agreement (PA) was a surprising high moment of multilateralism, and support for the obligations it sets is increasingly championed in parliaments, on the streets, within the business community and in courts. Some of the innovative aspects of its design also open possibilities for learning – its prohibition of backsliding in national commitments, the regular stocktakes with obligations for countries to use them for upgrading ambition – and there are strong supporting institutions on the knowledge side (IPCC) and on the finance side (the Global Climate Fund, among others).

Climate change is the perfect example of an issue requiring deliberation not only on the substantive problems it creates but also on how we go about solving them together as humanity as a whole and as a community of states. The new Better Climate Governance network[16] at Newcastle University aiming to improve negotiation effectiveness with mediation and facilitation might be able to help take this forward. This requires meta-deliberation on subsidiarity as described

earlier, considering the way the system is itself organised, and, if necessary, changing its structure. For example, how should climate governance be allocated to specific levels of governance, from the global level down through all branches of government across governance levels, and allowing all people to participate, thus creating in them a sense of justice and concern for the common good?

If reforms, in small or large steps, could be made under the UNFCCC and the PA, then it could set precedents for other areas of global environmental governance and the umbrella framework of an GEA as well. In this case, the first steps could be taken under the UNFCCC, if it could come so far as to adopt rules of procedures including moving away from always being confined by the consensus rule. If not, it may require a coalition of willing governments and civil society partners to start the process to push for change outside of and/or parallel to the established institutions.

As mentioned above, the knowledge provision function for global climate governance has a good foundation in the IPCC. However, this is not an entirely independent scientific institution but rather intergovernmental where the Summary for Policy Makers (SPM) is subject to government review and approval. The IPCC is also constrained in having to avoid issues that seem policy prescriptive. Furthermore, there is need for more knowledge. For example, there are gaps in reviewing what processes countries use to adopt Nationally Determined Contributions including how they identify their 'highest possible ambition' as required by the Paris Agreement, and on international cooperation measures. Generating more consistent knowledge on these aspects would enable learning what is most effective. Much more research on the effectiveness of mitigation and adaptation policies is also required, which might be guided by the proposed Global Policy Clearinghouse.[17] Many actors, including governments (by providing resources), scientific institutions, independent scientists and civil society think tanks could engage in filling these knowledge gaps.

An even bolder step would be to establish a scientific advisory council, where scientists (across all relevant disciplines including natural sciences, social sciences and the humanities) serve in their independent capacity. Their mandate would be similar to the councils established to support climate laws in a number of countries. Based on the formally adopted goals in the UNFCCC and PA and the information provided by the IPCC, they would advise on allocation of mitigation responsibilities among states, dividing the available budget on various transparent criteria. There has been an endless debate about the principles to be applied: historic responsibility for accumulated concentrations, per capita, per GDP, financial capacity, technical ability, lack of capacity, etc. The result must be a sharing of responsibilities for achieving specific targets and time-frames that is seen as just and equitable, resulting from a transparent and trustworthy process. Such careful analysis and deliberation on these issues could then become the basis for enforcement action. The advice of the scientific advisory council could be used in national deliberation processes on mitigation ambition – and, in due course as member states realise this is necessary – to support the adoption of binding emission reductions on countries.

Upgrading the legislative function of the UNFCCC and the PA to one where there are not only legal obligations related to process (submitting NDCs every five years) but also related to content is, in our view, necessary. Before states have reached the point where this is acceptable, however, much can be done to strengthen the deliberative function particularly at national level in support of ambitious climate action. The PA prescribes countries to 'be informed by' the outcomes of the global stocktake when they plan for their next NDC. This regular obligation on countries to be self-reflective on their ethical responsibility for a global common could be used to experiment and strengthen inclusive and authentic deliberation for the

global good. If states are willing to learn from each other in how to set up these processes in ways that support ecological reflexivity – with support from civil society and scientists – the needed increase in mitigation ambition could come from bottom-up.[18] But if this does not happen subsidiarity prescribes an international institution with the mandate to do what states are not willing or able to do themselves.

The same goes for the trust and justice building function. It is easy to argue that establishing accountability mechanisms where insufficient behaviour of states actually has implications – either through measures to build capacity where that is lacking, or through meaningful sanctions if caused by lack of will – is a basic element of making the agreements effective. Even under current rules, however, the existing facilitative accountability mechanisms (even if not called as such) can be used to the maximum of their ability by various actors (state and non-state) to support the much stronger palette of accountability mechanisms (formal and informal) that exist at national level. States with the means that continue to fall short in implementing their mitigation and financial commitments will lose the trust of other members of the international community and find the necessary global cooperation ever more difficult.

Environmental destruction and climate change are causing great loss and suffering, and this will accelerate. One complex area where the GEA will certainly need a mandate and the related competences is in determining loss and damages and who is liable, including the share of contributions to collective impact, and historic responsibility. Particular fault could be attributed to corrupt officials not performing their governance responsibilities, and to large private actors who have wilfully promoted misinformation. It is the poor and disadvantaged with the least responsibility that suffer the most. There will even be cases, such as some small island states, where a nation may lose its entire national territory leaving its citizens stateless. How can the victims be compensated? Can justice be done? Wealthy nations with the most historic responsibility have consistently refused any discussion of the issue, but such deliberation cannot be avoided forever. More recently, emerging economies choosing carbon-intensive pathways when alternatives are available may also bear some responsibility. This is where the justice function must find its place in climate action. It is the affluent - including elites and the wealthy in emerging economies and developing nations around the world - whose lifestyles and consumption patterns are the primary drivers of greenhouse gas emissions. They also have the most available means to compensate, address, or help to adapt to the damage caused. Continued failure to ensure adequate financial flows to those most affected by climate change will only increase global instability.

7. Conclusion

This review of the requirements and possibilities for creating a Global Environment Agency aims to demonstrate that this is both possible with adequate political will and, in our view, absolutely necessary given the current ecological risks being run. Such an institution would be able to orchestrate the many parts and multiple levels of environmental governance in all their diversity while ensuring that the global environmental commons is protected for the benefit of all, including future generations.

At the same time, we analyse the very real obstacles to progress, some of which are deeply rooted and defended by powerful interests. There is still a wide gap between what is required to ensure our future and what is deemed realistic in the present situation.

We hope by laying out as clearly as possible where we stand and the options before us, we can make a contribution to inspiring all stakeholders – and indeed, also citizen movements and the global public in every region of the world - to make the great efforts needed to find a way forward in time to preserve and restore the essential life-support systems of the planet.

References

Abbott, K.W. 2012. "The Transnational Regime Complex for Climate Change." *Environment and Planning C: Government and Policy* 30 (4): 571–90. **https://doi.org/10.1068/c11127**.

Aguila, Y. 2020. "A Global Pact for the Environment: The Logical Outcome of 50 Years of International Environmental Law." *Sustainability (Switzerland)* 12 (5636). **https://doi.org/10.3390/su12145636**.

Anderson, P. 2012. "International Environmental Law: Status, Problems, and Reform Prospects." *Climate Law* 3 (1): 71–91. **https://doi.org/10.3233/CL-2012-057**.

Bauer, S. 2013. "Strengthening the United Nations." In *The Handbook of Global Climate and Environment Policy*, 320–38. **https://doi.org/10.1002/9781118326213.ch19**.

Benvenisti, E. 2013. "Sovereigns as Trustees of Humanity: On the Accountability of States to Foreign Stakeholders." *American Journal of International Law* 107 (2): 295–333. **https://doi.org/10.5305/amerjintelaw.107.2.0295**.

Berkes, F. 2017. "Environmental Governance for the Anthropocene? Social-Ecological Systems, Resilience, and Collaborative Learning." *Sustainability (Switzerland)* 9 (7). **https://doi.org/10.3390/su9071232**.

Biermann, F. 2014. "The Anthropocene: A Governance Perspective." *The Anthropocene Review*. **https://doi.org/10.1177/2053019613516289**.

Biermann, F., and S. Bauer. 2005. *A World Environment Organization*. *A World Environment Organization: Solution or Threat for Effective International Environmental Governance?* Routledge. **https://doi.org/10.4324/9781315263564**.

Blagescu, M., L. de Las Casas, and R. Lloyd. 2005. "Pathways to Accountability: The GAP Framework." London.

Brousseau, E., T. Dedeurwaerdere, P.-A. Jouvet, and M. Willinger. 2012. *Global Environmental Commons: Analytical and Political Challenges in Building Governance Mechanisms*. Oxford scholarship online. **https://doi.org/10.1093/acprof:oso/9780199656202.001.0001**.

Carozza, P.G. 2003. "Subsidiarity as a Structural Principle of International Human Rights Law." *The American Journal of International Law* 97 (1): 38–79. **https://doi.org/10.2307/3087103[Opens in a new window]**.

Chambers, W.B. 2005. "From Environmental to Sustainable Development Governance: Thirty Years of Coordination within the United Nations." In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W B Chambers and J.F. Green, 13–39. Tokyo: United Nations University Press.

Chambers, W.B., and J.F. Green. 2005. *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*. Tokyo: United Nations University Press.

Charnovitz, S. 2005. "A World Environment Organization." In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 93–123. Tokyo: United Nations University Press.

Chen, C. 2010. "UNEP Institutional Reform with Its Impact on Developing Countries." In *Power Shifts and Global Governance: Challenges from South and North*, edited by Ashwani Kumar and Dirk Messner, 301–20. London: Anthem Press. **https://doi.org/10.7135/UPO9781843318842.018**.

Club des Juristes, Le. 2015. “Renforcer l’efficacité Du Droit International de l’environnement – Devoirs Des Etats, Droits Des Individus.” Paris. **https://www.leclubdesjuristes.com/les-commissions/rapport-renforcer-lefficacite-du-droit-international-de-lenvironnement-devoirs-des-etats-droits-des-individus-2/**.

Coen, D., J. Kreienkamp, and T. Pegram. 2020. *Global Climate Governance*. Cambridge: Cambridge University Press. **https://doi.org/10.1017/9781108973250**.

Dahl, A.L. 2018. “UNEP and the CSD Process for Sustainable Development Indicators.” In *Routledge Handbook of Sustainability Indicators*, edited by Simon Bell and Stephen Morse, 347–63. London and New York: Routledge.

Dasgupta, P. 2021. “The Economics of Biodiversity: The Dasgupta Review.” London. **https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review**.

Desai, B.H. 2014a. “Chapter 7 2nd Part - Revitalizing International Environmental Institutions.” In *International Environmental Governance: Towards UNEPO*, 168–218.

———. 2014b. “Chapter 9 - Conclusions.” In *International Environmental Governance: Towards UNEPO*, 265–73.

———. 2014c. “International Environmental Governance: Towards UNEPO.” *International Environmental Law*. Vol. 10. Leiden: Brill-Nijhoff.

DiGiacomo, P., L. Talaue-McManus, T. Aarup, E. Bayler, R. Christian, A.L. Dahl, D. DeLisle, et al. 2006. “A Coastal Theme for the IGOS Partnership: For the Monitoring of Our Environment from Space and from Earth.” *IGOS Integrated Global Observing Strategy, Report of the Coastal Theme Team. IOC Information Document No. 1220*. Paris. **https://unesdoc.unesco.org/ark:/48223/pf0000145874**.

Dooley, K., C. Holz, S. Kartha, S. Klinsky, J. T. Roberts, H. Shue, H. Winkler, et al. 2021. “Ethical Choices behind Quantifications of Fair Contributions under the Paris Agreement.” *Nature Climate Change* 11 (4): 300–305. **https://doi.org/10.1038/s41558-021-01015-8**.

Dryzek, J.S., and J. Pickering. 2017. “Deliberation as a Catalyst for Reflexive Environmental Governance.” *Ecological Economics* 131: 353–60. **https://doi.org/10.1016/j.ecolecon.2016.09.011**.

Dryzek, J.S., and H. Stevenson. 2011. “Global Democracy and Earth System Governance.” *Ecological Economics* 70 (11): 1865–74. **https://doi.org/10.1016/j.ecolecon.2011.01.021**.

Elliot, L. 2005. “Expanding the Mandate of the United Nations Security Council.” In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 204–26. Tokyo: United Nations University Press.

FOGGS. 2020. “Global Resilience Council for the People and the Planet.” UN75+25 Proposal (II). Brussels. **https://www.foggs.org/wp-content/uploads/2020/08/FOGGS-UN-75plus25_Proposal_II-Global-Resilience-Council_zero-draftfinal29-Aug-2020-1.pdf**.

Føllesdal, A. 1998. “Survey Article: Subsidiarity.” *The Journal of Political Philosophy* 6 (2): 190–218.

Fritz, J. 2000. “Second Report on International Scientific Advisory Processes on the Environment and Sustainable Development.” Geneva. **http://yabaha.net/dahl/earthw/sciadv2c.htm**.

Groff, M., and S.I. Karlsson-Vinkhuyzen. 2018. "The Rule of Law as a Global Public Good: Exploring Trajectories for Democratizing Global Governance Through Increased Accountability." In *The Commons and a New Global Governance?*, edited by S. Cogolati and J. Wouters, 130–59. Edward Elgar. **https://www.e-elgar.com/shop/the-commons-and-a-new-global-governance**.

Gunfaus, M.T., and H. Waisman. 2021. "Assessing the Adequacy of the Global Response to the Paris Agreement: Toward a Full Appraisal of Climate Ambition and Action." *Earth System Governance*, no. 100102 (March): 5. **https://doi.org/10.1016/j.esg.2021.100102**.

Gupta, J. 2005. "Global Environmental Governance: Challenges for the South from a Theoretical Perspective." In *A World Environment Organization: Solution or Threat for Effective International Environment Governance?*, edited by Frank Biermann and Steffen Bauer, 57–83. London: Routledge. **https://doi.org/https://doi.org/10.4324/9781315263564.**

Gupta, J., and S. Stec. 2014. "Strengthening UNEP's Legitimacy: Towards Greater Stakeholder Engagement." Nairobi. **https://wedocs.unep.org/20.500.11822/7461**.

Haas, P.M. 1990. *Saving the Mediterranean: The Politics of International Environmental Cooperation*. New York: Columbia University Press.

Hak, T., B. Moldan, and A.L. Dahl. 2007. *Sustainability Indicators: A Scientific Assessment*. Scientific. Washington, DC: Island Press.

Hickmann, T., O. Widerberg, M. Lederer, and P. Pattberg. 2021. "The United Nations Framework Convention on Climate Change Secretariat as an Orchestrator in Global Climate Policymaking." *International Review of Administrative Sciences* 87 (1): 21–38. **https://doi.org/10.1177/0020852319840425**.

Huddleston, J. 1989. *The Search for a Just Society*. Oxford: George Ronald.

IPBES. 2012. "Functions, Operating Principles and Institutional Arrangements of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services." Bonn. **https://ipbes.net/sites/default/files/downloads/functions_operating_principles_and_institutional_arrangements_of_ipbes_2012.pdf**.

Ivanova, M. 2012. "Institutional Design and UNEP Reform: Historical Insights on Form, Function and Financing." *International Affairs* 88 (3): 565–84. **https://doi.org/10.1111/j.1468-2346.2012.01089.x**.

Ivanova, M. 2021. *The Untold Story of the World's Leading Environmental Institution: UNEP at Fifty*. Cambridge, Massachusetts: The MIT Press. **https://doi.org/10.7551/mitpress/12373.001.0001**.

Jachtenfuchs, M., and N. Krisch. 2016. "Subsidiarity in Global Governance." *Law and Contemporary Problems* 79 (2): 1–26.

Jänicke, M. 2017. "The Multi-Level System of Global Climate Governance – the Model and Its Current State." *Environmental Policy and Governance* 27 (2): 108–21. **https://doi.org/10.1002/eet.1747**.

Juste Ruiz, J. 2020. "The Process towards a Global Pact for the Environment at the United Nations: From Legal Ambition to Political Dilution." *Review of European, Comparative and International Environmental Law* 29 (3): 479–90. **https://doi.org/10.1111/reel.12331**.

Karlberg, M. 2004. *Beyond the Culture of Contest*. Oxford: George Ronald.

Karlsson-Vinkhuyzen, S.I. 2013a. "The Role of Principles for Allocating Governance Levels in the 2002 World Summit on Sustainable Development." *International Environmental Agreements: Politics, Law and Economics* 13 (4): 441–59. **https://doi.org/10.1007/s10784-012-9205-y**.

———. 2013b. "The Role of Principles for Allocating Governance Levels in the 2002 World Summit on Sustainable Development." *International Environmental Agreements: Politics, Law and Economics* 13: 441–59. **https://doi.org/10.1007/s10784-012-9205-y**.

Karlsson-Vinkhuyzen, S.I., M. Groff, P.A. Tamás, A.L. Dahl, M. Harder, and G. Hassall. 2018. "Entry into Force and Then? The Paris Agreement and State Accountability." *Climate Policy* 18 (5): 593–99. **https://doi.org/10.1080/14693062.2017.1331904**.

Karlsson, S.I. 2002. "The North-South Knowledge Divide: Consequences for Global Environmental Governance." In *Global Environmental Governance: Options & Opportunities*, edited by Daniel C. Esty and Maria H. Ivanova, 53–76. New Haven, CT: Yale School of Forestry & Environmental Studies.

Kim, R.E. 2013. "The Emergent Network Structure of the Multilateral Environmental Agreement System." *Global Environmental Change* 23 (5): 980–91. **https://doi.org/10.1016/j.gloenvcha.2013.07.006**.

Knight, W. A. 1996. "Towards a Subsidiarity Model for Peacemaking and Preventive Diplomacy: Making Chapter VIII of the UN Charter Operational." *Third World Quarterly* 17 (1): 31–52.

Kohler, P. M. 2020. *Science Advice and Global Environmental Governance: Expert Institutions and the Implementation of International Environmental Treaties*. Anthem Press.

Kotzé, L.J. 2019. "Earth System Law for the Anthropocene." *Sustainability (Switzerland)* 11 (23). **https://doi.org/10.3390/su11236796**.

Kumm, M. 2016. "Sovereignty and the Right to Be Left Alone: Subsidiarity, Justicesensitive Externalities, and the Proper Domain of the Consent Requirement in International Law." *Law and Contemporary Problems* 79 (2): 239–58.

Kütting, G. 2014. "Rethinking Global Environmental Governance: Coordinating Ecological Policy." *Critical Policy Studies* 8 (2): 227–34. **https://doi.org/10.1080/19460171.2014.904236**.

Lee, F.J. 2010. "Global Institutional Choice." *New York University Law Review* 85 (1): 328–57.

Lodefalk, M., and J. Whalley. 2002. "Reviewing Proposals for a World Environmental Organisation." *World Economy* 25 (5): 601–17. **https://doi.org/10.1111/1467-9701.00452**.

Lopez-Claros, A. 2021. Forthcoming report. Global Challenges Foundation.

Lopez-Claros, A., A. Dahl, and M. Groff. 2020. *Global Governance and the Emergence of Global Institutions for the 21st Century*. Cambridge: Cambridge University Press. **https://doi.org/doi:10.1017/9781108569293**.

López Claros, A. 2015. "Removing Impediments to Sustainable Economic Development: The Case of Corruption." *Journal of International Commerce, Economics and Policy* 6 (1): 1–35. **https://doi.org/10.1142/S1793993315500027**.

Manga, S.-J.-T. 2010. "International Environmental Governance Reform within the United Nations: Seeking More Sustainability towards and beyond Rio + 20 Earth Environment Summit." *Quebec Journal of International Law* 23 (2): 209–24. **https://doi.org/https://doi.org/10.7202/1068403ar**.

Mansbridge, J. 2009. “A ‘Selection Model’ of Political Representation.” *The Journal of Political Philosophy* 17 (4): 369–98.

Matisoff, D.C. 2010. “Are International Environmental Agreements Enforceable? Implications for Institutional Design.” *International Environmental Agreements: Politics, Law and Economics* 10 (3): 165–86. **https://doi.org/10.1007/s10784-010-9118-6**.

Mauerhofer, V. 2019. “Legal Institutions and Ecological Economics: Their Common Contribution for Achieving a Sustainable Development.” *Ecological Economics* 156: 350–59. **https://doi.org/10.1016/j.ecolecon.2018.09.023**.

Mayer, B. 2015. “Conceiving the Rationale for International Climate Law.” *Climatic Change* 130 (3): 371–82. **https://doi.org/10.1007/s10584-014-1271-4**.

Mee, L.D. 2005. “The Role of UNEP and UNDP in Multilateral Environmental Agreements.” *International Environmental Agreements: Politics, Law and Economics* 5 (3): 227–63. **https://doi.org/10.1007/s10784-005-3805-8**.

Michaelowa, K., and A. Michaelowa. 2017. “Transnational Climate Governance Initiatives: Designed for Effective Climate Change Mitigation?” *International Interactions* 43 (1): 129–55. **https://doi.org/10.1080/03050629.2017.1256110**.

Moldan, B., S. Billharz, and R. Matravers. 1997. *Sustainability Indicators: A Report on the Project on Indicators of Sustainable Development*. Scientific. Chichester: John Wiley & Sons.

Moltke, K. von. 2005. “Clustering International Environmental Agreements as an Alternative to a World Environment Organization.” In *A World Environment Organization: Solution or Threat for Effective International Environment Governance?*, edited by Frank Biermann and Steffen Bauer, 175–203. London: Routledge. **https://doi.org/https://doi.org/10.4324/9781315263564**.

———. 2006. “On Clustering International Environmental Agreements.” In *Multilevel Governance of Global Environmental Change: Perspectives from Science, Sociology and the Law*, edited by G. Winter, 409–29. Cambridge: Cambridge University Press. **https://doi.org/10.1017/CBO9780511720888.017**.

Monroe, K. R. 1996. *The Heart of Altruism*. Princeton, NJ: Princeton University Press.

Najam, A. 2005. “Neither Necessary, Nor Sufficient: Why Organizational Tinkering Will Not Improve Environmental Governance.” In *A World Environment Organization: Solution or Threat for Effective International Environment Governance?*, edited by Frank Biermann and Steffen Bauer, 235–56. London: Routledge. **https://doi.org/https://doi.org/10.4324/9781315263564**.

Oberthür, S. 2005. “Clustering of Multilateral Environmental Agreements: Potentials and Limitations.” In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 40–65. Tokyo: United Nations University Press.

———. 2009. “Interplay Management: Enhancing Environmental Policy Integration among International Institutions.” *International Environmental Agreements: Politics, Law and Economics* 9 (4): 371–91. **https://doi.org/10.1007/s10784-009-9109-7**.

Oberthür, S., and T. Gehring. 2005. “Reforming International Environmental Governance: An Institutional Perspective on Proposals for a World Environment Organization.” In *A World Environment Organization: Solution or Threat for Effective International Environment Governance?*, edited by Frank Biermann and Steffen Bauer, 205–34. London: Routledge. **https://doi.org/https://doi.org/10.4324/9781315263564**.

Oberthür, S., L. Hermwille, and T. Rayner. 2021. “A Sectoral Perspective on Global

Climate Governance: Analytical Foundation." *Earth System Governance*, 100104. **https://doi.org/https://doi.org/10.1016/j.esg.2021.100104**.

Olsen, S. H., and M. Elder. 2011. "Strengthening International Environmental Governance by Two-Phased Reform of UNEP: Analysis of Benefits and Drawbacks." Kanagawa, Japan. **http://www.jstor.com/stable/resrep00871**.

Ostrom, E. 2014. "A Polycentric Approach for Coping with Climate Change." *Annals of Economics and Finance* 15 (1): 97–134.

Pauwelyn, Joost. 2005. "Judicial Mechanisms: Is There a Need for a World Environment Court?" In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 150–77. Tokyo: United Nations University Press.

Pickering, J. 2019. "Ecological Reflexivity: Characterising an Elusive Virtue for Governance in the Anthropocene." *Environmental Politics* 28 (7): 1145–66. **https://doi.org/10.1080/09644016.2018.1487148**.

Redgwell, C. 2005. "Reforming the United Nations Trusteeship Council." In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 178–203. Tokyo: United Nations University Press.

Sampson, G.P. 2005. "The World Trade Organization and Global Environmental Governance." In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 124–49. Tokyo: United Nations University Press.

Susskind, L. 2008. "Strengthening the Global Environmental Treaty System." *Issues in Science and Technology* 25 (1): 61–69.

Tarasofsky, R.G. 2002. "International Environmental Governance: Strengthening UNEP." **https://archive.unu.edu/inter-linkages/docs/IEG/Tarasofsky.pdf**.

———. 2005. "Strengthening International Environmental Governance by Strengthening UNEP." In *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*, edited by W. Bradnee Chambers and J.F. Green, 66–92. Tokyo: United Nations University Press.

Turnheim, B., and M.Y. Tezcan. 2010. "Complex Governance to Cope with Global Environmental Risk: An Assessment of the United Nations Framework Convention on Climate Change." *Science and Engineering Ethics* 16 (3): 517–33. **https://doi.org/10.1007/s11948-009-9170-1**.

UN. 1972. "Report of the United Nations Conference on the Human Environment." *A/CONF.48/14/Rev.1*. New York.

———. 1992. "Agenda 21: Programme of Action for Sustainable Development." *United Nations Conference on Environment and Development*. New York. **https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf**.

UN Secretary-General. 1997. "Renewing the United Nations: A Programme for Reform: Report of the Secretary-General." New York.

UNEP. 2019. "Environmental Rule of Law: First Global Report." Nairobi. **https://wedocs.unep.org/handle/20.500.11822/27279**.

Urho, N., M. Ivanova, A. Dubrova, and N. Escobar-Pemberthy. 2019. "International Environmental Governance – Accomplishments and Way Forward." Copenhagen. **https://doi.org/10.6027/TN2019:518**.

Ward, B., and R. Dubos. 1972. *Only One Earth: The Care and Maintenance of a Small Planet*. New York: W.W. Norton & Co.

Wathne, C., and M. C. Stephenson. 2021. "The Credibility of Corruption Statistics A Critical Review of Ten Global Estimates." Norway.

Woolley, O. 2020. "What Would Ecological Climate Change Law Look like? Developing a Method for Analysing the International Climate Change Regime from an Ecological Perspective." *Review of European, Comparative and International Environmental Law* 29 (1): 76–85. **https://doi.org/10.1111/reel.12310**.

Appendices

Appendix 1

METHODOLOGY AND SEARCH PROTOCOL FOR LITERATURE REVIEW

The literature review was directed to a set of key topics for the report and for each topic a set of key words were identified. The searches were carried out in Scopus and limited to scientific publications in English. The search protocol was complemented with expert guided searches for specific authors known to have published on the subjects. In some cases, the citations of key papers were tracked, particularly for topics with fewer results. The search results were uploaded to the reference software Mendeley, a total of 236 items. In a few cases, we could not locate the publication. The papers/books abstracts were manually scanned, primarily based on abstracts, for relevance by the authors of the report and about 90 were read in full and used as appropriate in the report.

Topic	First search words	AND	AND
Design principles			
Vertical allocation of responsibility/authority	(environmental) federalism, subsidiarity, ecological/environmental fit, multi-level, public goods	International or global	Regulation or governance or management or law
Central governance functions/capabilities	(ecological) reflexivity, deliberative, orchestration, interplay, legislative, executive, judiciary	International or global	Climate or environment
Functions of a global environmental agency	Global/international/world environmental organization, global/international/world environmental agency, UNEP, global environmental governance	Functions or responsibilities or tasks, or mandate or...	
Governance theories	Complex system/polycentric/multilevel/ adaptive governance	International or global or multilevel	Climate or environment
Analysing existing proposals			
	Global/international/world environment organization, global/international/world environmental agency, UNEP, UNEA, global environmental governance	Reform or proposal or strengthening	
	International environmental law, multilateral environmental agreements	Reform or proposal or strengthening	
Multilateral Environmental Agreements			
Status of compliance	Multilateral environmental Agreements (MEAs)	Compliance OR implementation	
	International Environmental Agreements (IEA)	Compliance OR implementation	
	Global environmental/climate/biodiversity goals	Implementation OR goal achievement	
Reasons for non-compliance	MEAs/IEAs (see above)	Non-compliance OR Implementation gap	
Accountability mechanisms	MEAs/IEAs (see above)	Enforcement/accountability/ Follow-up and review,	Mechanism
	International law	Enforcement/accountability/ Follow-up and review	Environment/ Climate change/ biodiversity

Appendix 2

ROOT CAUSES OF FAILURES IN ENVIRONMENTAL GOVERNANCE

The many efforts to propose reforms to international environmental governance have generally failed, or led only to marginal improvements, while the planetary environment has continued to degrade, even accelerating towards a complex environmental catastrophe of runaway global warming, biodiversity collapse, resource degradation and persistent pollution representing existential threats to civilization if not human survival. Beyond all the institutional questions, there are more fundamental issues that stand in the way of any efforts at effective global governance as it has been approached to date. These include unequal power relations, the resistance from vested interest in the present system, and general failures in justice, equity and morality. Global environmental governance cannot ignore them, but they only can be addresses within broader efforts to reform the global system.

There are several specific dimensions to this problem that are reviewed briefly in the report and are explored in more detail here as a guide to addressing them: global public goods, national sovereignty, the North-South split, neoclassical economics, and corruption.

Global Public Goods

Many aspects of the natural systems that maintain the global environment are global public goods, in that they belong to and benefit everyone and cannot be owned or privatized. They are parts of the global commons, including the atmosphere and open oceans, and processes such as the climate system and carbon cycle, cycles of nitrogen, phosphorus and various chemical pollutants, the living components of the biosphere that do not respect boundaries, provide global services and are integrated at the global level, etc.

Governance of global public goods can only be done at the global level, and this presents specific challenges. If such public goods are properly cared for, maintaining the capital resource and generating interest/services, everyone benefits, and if they are damaged or degraded, everyone suffers. This means that many of the tools and motivations for governance, such as being rewarded for good management or punished for destructive activities cannot be targeted to those responsible.

The most fundamental requirement in governance or in any human organization is cooperation and reciprocity, working together to achieve common goals. This is true both of individuals and institutions. As systems of organization become more complex, they need higher levels of cooperation that enable them to increase in efficiency and productivity. This comes down to the values by which each individual or institution operates with respect to all the others. At one extreme is the selfish consumer, trying to grab the maximum benefits without making any contribution. The result is the tragedy of the commons, when every actor grabs what they can before others get there, until the resource is destroyed. At the other extreme is the 'altruistic sustainer', fully devoted to the common good and working to protect the resource and even increase the wealth generated for all. In between, we see the monopolistic exploiter, seeing the need to maintain the resource (at least in the short term), but aiming to capture all the wealth by absorbing competitors or reducing them to slavery/subsistence where they contribute to wealth creation without gaining any benefit. For these uncooperative actors, the ends generally justify any means; values like justice or equity are meaningless.

In an ideal system where all are altruistic sustainers, governance only needs to share the information necessary for resource maintenance, and distribute the

wealth created equitably. However, if there are even a few selfish consumers or monopolistic exploiters that ignore the common good, they eventually neutralise or overcome the former, leading ultimately to resource overshoot and collapse. Governance must be sufficiently effective to control those destroying the common good, just as it must control criminals in a society for the good of all. In terms of global environmental governance for issues such as climate change, no matter how much is done by governments and other actors working for the common good, if there is no effective or overall control of those, whether countries, corporations or other actors, that insist on maintaining or increasing emissions of greenhouse gases for short-term benefit, a climate catastrophe will be inevitable. This is the immediate and urgent challenge of global governance.

National Sovereignty

At the heart of the present system of global governance is the concept of national sovereignty, so this requires a closer look. It extends to the national and international levels an exaggerated principle of individualism, with a sovereign nation free from any outside interference in its internal affairs, just as each individual person might claim absolute rights and freedoms without regard for others. Yet humans are a social species, incapable of living in complete autarchy, but forming families, communities and many other groupings with shared dependence and responsibilities. Different cultures spread across a spectrum from a strong emphasis on individual freedom to more collective forms of organization to advance together. Neither extreme is desirable, with a person flourishing best with individual freedom and initiative finding expression in service to the community. Similarly, **national autonomy** is essential to respond to the many different environmental contexts and cultural expressions on a planet with great diversity. However, in a globalized world pushing planetary boundaries, nations also must give priority to the global common good. No country can claim that climate change or pandemics stop at its borders, or that it can be completely self-sufficient economically without reverting to a very primitive state. In a globalized world, maximal national sovereignty is an outworn concept that could be replaced by more meaningful concepts of national autonomy (Lopez-Claros, Dahl, and Groff 2020).

In today's world, where the economy is pre-eminent and power and wealth are dominant goals individually and collectively, the current ideal of national sovereignty becomes an excuse to hide behind, a defensive rampart allowing autocrats to seize or maintain power, ideologies to stamp out diversity and to monopolize belief, racial groups to perpetrate genocide, and corruption to run rampant.

Even the division of the world into developed and developing countries, the fundamental cleavage in the UN system, while seemingly working to address poverty, has largely failed, except for China and to some extent India where domestic policies have reduced extreme poverty. The present global economic system has not reduced **inequality**, which is still one of the SDGs, with half the world population struggling to meet basic needs while wealth concentrates at the top of the pyramid. The colonial system of governments has simply been replaced by a new colonization by multinational corporations and their state equivalents, extracting more wealth from the developing countries than aid puts back in, and maintaining their dependence. Many of the wealthiest countries, often largely controlled or influenced by powerful private sector lobbies, have exerted themselves strenuously to prevent any interference with a certain type of market-driven economic system and free trade, along with expanding intellectual property rights over knowledge and science, and the private control of information systems, technologies and medical treatments, with profit as the first priority. Even the massive effort in **development assistance** since World War II has largely failed, with a top-down

approach to financial aid that has too often simply fuelled corruption and governance failures in the recipient countries. On both sides, the incentive for those in power is to preserve the status quo and to avoid environmental concerns that might reduce the benefits that they reap. It is no wonder that efforts to strengthen global environmental governance have met strong resistance, with the consensus rule one indirect way to ensure blockage.

North-South Split

Beyond the dominant principle of sovereign nations placing national interest first, the United Nations has been plagued by the split and stand-off between North and South, developed and developing countries, rich and poor, at least as defined in material or economic terms. As countries were decolonized and joined the UN, they formed a bloc, the G77 and China, to speak for their interests faced with the political and economic power of the developed countries which not only defended their own political interests but the whole Western economic system, which too often replaced colonization by newer forms of economic exploitation. As the countries of the North became aware of the planetary environmental consequences of their economic activities and pushed for control measures, the developing countries, lacking **trust**, saw in this an attempt to prevent them from profiting from their own resources, or using "environment" as a disguise for efforts to protect economic advantage. The divide is expressed in many ways, including in science and access to knowledge (Karlsson 2002). This has been one significant cause of failures to reform or strengthen global environmental governance that must be addressed if reform is to go forward.

Developing countries can be generally characterised as post-colonial and politically unstable, with weak economies and soft currencies, that struggle to provide basic necessities for their populations, pushing them to **exploit their environment** for whatever resources or commodities they can market. Since international negotiations for environmental governance generally address developed country problems, developing countries are ill prepared to negotiate (Gupta 2005).

From a South perspective as analysed by Najam (2005), organizational structure is only one relatively small element of the crisis in governance. The discourse should address fundamental questions such as why the environment is degrading, why global cooperation flounders, or even why we need global environmental governance. Najam emphasizes that there is a fundamental **absence of willingness on the part of states**, with regimes that fail to target those creating the problems, when this is a challenge of social justice. The same failures will plague any new organization. The hopeful compact on sustainable development agreed at Rio in 1992, based on the understanding between South and North that environment and development are integrated concerns with social justice and equity, failed at WSSD in 2002. The South has lived through years of broken global promises by Northern governments to provide finance and transfer technologies for sustainable development, creating deep distrust. UNEP's efforts in environmental governance have been denied authority and resources because the nation states wish to deny them. The countries most responsible for the global ecological crisis are unwilling to allow effective global environmental cooperation (Najam 2005).

A second challenge is the failure to meaningfully include **civil society concerns**, especially from the South. States lack the direct ability or authority to take key environmental decisions, requiring global environmental governance to be a society-centric and to connect with emerging global public policy networks. The need is better networking and legitimacy (Najam 2005).

Neoclassical economics

Anderson (2012) provides an enlightening critique of the existing framework of the global market economy as a root cause of failures of effective environmental governance. In neoclassical economics, environmental problems are economic problems and represent **market failures** from inefficient resource-use allocation, when there is no market for resources, or their prices do not reflect consumer preferences. He shows that the true costs of resource use are externalized, or natural resources are privatised to create a market. Inefficient allocations can be corrected by basing taxes, charges, or emission credits on shadow prices from willingness to pay. But even internalising externalities might not be sustainable because the aim is to internalize the social cost and not the harm itself.

He explains that social costs are only reduced to where the **marginal social cost** of economic activities equals their marginal benefits, with environmental protection reduced in three ways. First, only those buying and selling have standing, so future generations and non-human beings that are unable to buy and sell have no standing. Second, the market ranks preferences according to willingness to pay for satisfaction or to accept 'compensation', excluding preferences that cannot be assigned a price. Third, the price of preferences for environmental goods is proportionate to the wealth of those with standing and the ability to pay, ignoring what the poor care about.

A competitive market encourages participants to use resources at a rate proportionate to the **rate of return**, not resource replenishment; to devalue resources that do not expand capital; and to shift costs onto others who cannot affect the price, including future generations. Those who do not seek the highest returns are at a comparative disadvantage.

The use of productive resources is a function of **access to credit**, expectations of future revenue, and a rate in excess of the rate of interest and of competition with rivals, creating a dynamic for investment strategies in terms of opportunity costs and benefits.

Anderson emphasises the problem of **economic accounting** where the environment is a mere factor of production recognized by what people will pay for its goods and services. This assumes the complete substitution of human-made for natural capital, with no need for natural resource conservation. The true value of 'ecosystem services,' vital for sustaining human and other life and civilization as we know it, are not accounted for (Dasgupta 2021). Within the current accounting paradigm as described by Anderson, individuals are only consumers ranked by willingness to pay. This does not capture people as citizens concerned about environmental sustainability, reducing people's values to exchange value in a price relationship. This ensures that what people most care about is disregarded, including things such as social relations, non-human beings, special places, environments, or even the flourishing and survival of humanity as a whole. Since core values are a basis for preventing harm to what people value, this undermines the rationale for mitigation. Anderson proposes to exclude market instruments and norms from areas that matter most to people.

For Anderson, neoclassical economics sees the relationship between people and the environment as one not of price but of **property relations**, with allocations based on prices set by supply or entitlement to sell and demand based on ability to pay, which in turn are a function of resource property rights. Dominant property relations reflect the social justice in a society, which should have priority over efficiency.

Finally, Anderson notes that the economic approach to sustainability assumes a proxy property rule granting a de facto **right to harmful use**, replacing liability rules giving people a right to bodily integrity or to an undamaged environment.

This is because economics treats environmental harm as a cost externalized from production. Resource extraction needs to be economically efficient, where victims consent to harm or the risk of harm, to be mitigated to a level at which causing it is insufficiently profitable, or at which victims assign a sufficiently high monetary value to their bodily integrity or to the protection of the environment (Anderson 2012).

As long as these economic assumptions are dominant, global environmental governance has little chance of being effective.

Corruption

Another serious challenge with under-appreciated serious impacts on the environment is widespread corruption undermining effective governance, subverting the rule of law and the respect of international obligations, and extracting a significant part of the finance normally directed to climate change action, biodiversity conservation and environmental protection. Lopez-Claros (2015) analyses many of the institutional mechanisms behind corruption and the impact of corruption on development. There are no good statistics about the importance of corruption globally. Its magnitude is suggested by a recent analysis providing the following problematic figures with data from two decades ago: "suggestive evidence that the amount paid in bribes each year was probably somewhere between US$600 billion and US$1.76 trillion"; "illicit financial flows from developing countries, including but not limited to the proceeds of corruption and other illegal activities, were estimated at roughly US$660 billion per year"; "international development officers working in the early 2000s conjectured that roughly 10%–15% of public procurement spending was lost to corruption"; "an independent audit of projects sponsored by the UN Global Fund to Fight AIDS, Tuberculosis and Malaria found that 30%–67% of the funds were misspent, often due to corruption"; "customs-related corruption costs World Customs Organization members at least US$2 billion per year"; "researchers have found strong evidence that corruption increases child mortality rates" (Wathne and Stephenson 2021, table 1, pp. 30-32). In the environmental domain, illegal land clearing, logging, fishing and trade in wildlife are largely out of control. Political leaders are particularly vulnerable to the temptations of corruption and the pressure of powerful lobbies, leading in extreme cases to state capture by organized crime. The best efforts at environmental governance are neutralized if not reversed by these negative forces.[19]

Conclusion on Root Causes

All this suggests that more fundamental changes in the global system will be required, and the particular institutional form that global environmental governance might take will be secondary. At best, this review of proposals for a global environment agency can draw on some lessons learned to suggest what the optimal form and functions of such an agency could be to address the urgent needs to reverse the rapid degradation of the planetary environment and its resources, and to begin processes of regeneration and restoration of its capacity to maintain a liveable environment and to provide the basis for future civilization.

Appendix 3

SCIENTIFIC ADVISORY PROCESSES

Kohler (2020) explores in detail the complexities of designing and institutionalising global scientific assessment processes in ways that can provide important guidance for the future. Creating a scientific advisory group can set norms that will go on to shape procedures and expectations in a broad array of institutions in global environmental governance. This far-reaching impact raises questions as to how transparent the setting of those norms is in the first place. Where scientific advice is still often elaborated behind closed doors, what value judgments, injustices and power inequities risk being reproduced with far-reaching impacts? Science-policy groups continue to frame their work, and their membership, as disinterested and insulated from politics, preserving the narrative that they, and their work, merely convey research findings, and the state parties are the ones doing the interpreting and decision making. But the global scale at which such science bodies operate brings inescapable political pressures. How to deliberate, which (and whose) knowledge counts, even which questions to ask in the first place, are not neutral choices (Kohler 2020).

One example is in the instrumentalizing or valuing of ecosystem services in economic terms, versus accepting the rights of nature as above any attempt at valuation. Environmental rights are still far from being recognized at the global level. Yet 76 countries explicitly recognize an individual substantive right to a quality environment in their constitution. There is the UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), a regional Convention adopted in 1998, that focuses on procedural rights (Kohler 2020), and a similar convention has recently been adopted in the Americas. Numerous compelling examples demonstrate the importance of bringing diverse experiences, viewpoints and ways of knowing to bear on the co-production of science in order to successfully frame, understand and address a problem.

Drawing from these examples, Kohler defines three dimensions of institutionalising science advice. The **body of experts** delineates who gets to participate as experts, when membership may be configured to serve particular interests and these choices are sometimes made more or less transparent. The **institutional body** refers to the rules and practices that can deliver a "balanced committee," often with careful stage management. The **body of knowledge** captures how different ways of knowing are prioritized, with some spheres dismissed as being beyond the bounds of relevant expertise. Since these norms are not often scrutinized, not paying attention to what, or who, is erased or excluded in the making of these norms in the first place may contribute to an enduring democratic deficit, both in providing science advice and also in global environmental governance more broadly. The following sections based on Kohler explore these dimensions in more detail.

Body of Experts

There are various norms in different conventions regarding geographic and economic balance among the experts: using the representation of 5 UN regions; requiring parity between developed and developing countries; balancing geographic representation and economic diversity. The FAO recognizes 7 regions: Africa, Asia, Europe, Latin America and the Caribbean, the Near East, North America and the Southwest Pacific, while CITES and Ramsar have 6 regions, with a numerical formula among the different regions to reflect the number of parties in each region. There are norms regarding bias and conflicts of interest, regarding gender diver-

sity, or requiring intersectionality, where gender will not play out separately from race, or country of origin, or disciplinary expertise.

Institutional Body

At the institutional level, there are norms regarding the inscription of rules, and the role that the rules governing these bodies play in impacting the legitimacy of expertise. There are norms regarding consensus where there may be trade-offs, where closure does not necessarily mean that everyone explicitly agrees, but given a level of scientific uncertainty, views have been expressed and there is collective ownership of the written conclusions. Other norms concern stage management and transparency, where a closed meeting, for example, might include a reporter for the **Earth Negotiations Bulletin**.[20] Other rules govern balance for institutional diversity, issue-specific legitimacy, or how different types of expertise complement each other. Over time, there may need to be opportunities for new voices to make meaningful contributions, striking a balance between preserving institutional memory and avoiding that a small number of experts to monopolize the provision of advice.

Body of Knowledge

With respect to the body of knowledge incorporated in the scientific advice, there are norms regarding boundary setting: which materials do not meet the standard for "good science," what falls under the purview of science advice and what should be considered a policy question, what are the essential disciplines and subdisciplines for providing advice, to what scientific disciplines do authors of studies in that field belong and their relative contributions to the body of knowledge in the field. There is the problem of reliance on existing peer-reviewed literature, when one of the recognized barriers to incorporating local and traditional knowledge is the inadequacy of peer-review mechanisms for these ways of knowing. Also, researchers who lack local understanding of the community they are studying can generate significant misunderstandings and essential erasures in setting policy. Where there is reliance on English as the working language, who or what does this exclude? Expanding the range of disciplines and the scale and scope of knowledge available to science advisory processes will be a constant challenge, but it is necessary for the achievement of their mandates (Kohler 2020).

The above review by Kohler demonstrates how scientific advisory processes are establishing norms that will impact other, broader, international scientific ventures, and it concludes that scientists on any new science-advisory body established to supply comprehensive advice in a given field should reflect all the disciplines that constitute that field.

Appendix 4

UNEP AND ENVIRONMENTAL ASSESSMENT

Given the importance to global environmental governance of knowledge in general and environmental assessment and scientific advisory processes in particular, it can be useful to consider the United Nations Environment Programme (UNEP) as a case study of successes and failures in using the science of environmental assessment to guide policy-making and environmental management.

An appropriate starting point is the 1972 United Nations Conference on the Human Environment (UNCHE) in Stockholm that created UNEP. In the lead up to the conference, its Secretary-General, Maurice Strong, asked eminent scientist René Dubos to chair a group of 152 experts from 58 countries to prepare an unofficial report as the major intellectual input to the conference (Ward and Dubos 1972), an early example of independent scientific advice specifically for policy-making.

UNEP was created as the leading global environmental authority, intended to set the global agenda, promote the adoption and implementation of environmental goals and agreements, and serving as the authoritative advocate for the global environment. The first section of the Stockholm Action Plan (UN 1972) is titled Environmental Assessment (Earthwatch) and includes recommendations on evaluation and review, research, monitoring, and information exchange that provided the foundation for the scientific advisory and science-policy functions of the United Nations for the environment, that became institutionalized in UNEP.

We illustrate the challenges of implementing such a broad mandate for UNEP to carry out assessments with two specific examples at the science-policy interface: marine pollution and the Regional Seas Programme, and implementing what came to be called the UN System-wide Earthwatch. These cases show both the profound impact that a few competent and ethically-motivated individual scientists with the right institutional mandate can have on global environmental action, and the vulnerability of small organizations when staff changes interrupt institutional continuity.

UNEP REGIONAL SEAS PROGRAMME

Marine pollution emerged as an important issue in the five years before Stockholm, with major oil spills. A number of UN agencies were involved in setting up the Joint Group of Experts on the Scientific Aspects of Marine Pollution (later Marine Environmental Protection – GESAMP) in 1969 to provide the main input on the marine environment to the Stockholm Conference. UNEP recruited marine scientist Dr. Stjepan Keckes to address the problem of marine pollution, which from the nature of different sea areas lent itself to a regional approach. He started in the Mediterranean Sea in 1974, working through scientists in each country. By building first on the science, these experts shaped a common policy put forward by the experts' respective states, which eventually helped in bringing about the Mediterranean Action Plan (Haas 1990). This made it possible to negotiate a legal agreement, the Barcelona Convention, with various technical annexes, to implement it. The science motivated otherwise antagonistic countries to work together to protect their shared sea area.

Building on this example, with a team of professionals based in Geneva, he began replicating the model for other sea areas, assembling the science and working towards a legal agreement, eventually covering 12 regional seas around the planet. Most of these were under UNEP's direct responsibility, but some were administratively independent, such as the South Pacific Regional Environment Programme (SPREP), initiated by the South Pacific Commission in 1974 and adopted and supported by UNEP as a Regional Seas Programme, and in the Black Sea that

independently followed the same model. Interagency collaboration was ensured by UNEP contracting with other agencies like FAO and IOC to implement parts of the programme, and through regular interagency coordination meetings. There was an extensive publication programme of Regional Seas Reports and Studies, Directories and Bibliographies, and close scientific ties with research scientists and those in other UN agencies. Regional Seas was often described as the "jewel in the crown of UNEP" (Desai 2014, p. 176).

What happened next illustrates the problems UNEP has faced in living up to its wide mandate. In 1985, under pressure to strengthen UNEP's headquarters as the first UN agency based in a developing country, the Executive Director ordered the Regional Seas Programme to move from Geneva to Nairobi. At the time, Nairobi was not a place where a scientist could keep up with his/her field, follow the scientific literature, attend scientific meetings and keep in touch with colleagues. Even international telephone calls did not work most of the time. All the professional staff resigned, and UNEP moved its files and one secretary to Nairobi. Keckes was eventually convinced to come back and rebuild the programme from Nairobi, and he brought in Dr. Arthur Dahl, the organizer of SPREP, to assist and eventually become his deputy. While recruitment of scientists was difficult, the programme expanded until 1991, although with resources spread so thinly, implementation on the ground was often lacking.

In the lead up to the 1992 United Nations Conference on Environment and Development (UNCED), the Rio Earth Summit, expert working parties of scientists and agency representatives worked on the various chapters of the action plan, Agenda 21, being negotiated by the Preparatory Committee of governments. Dahl, a coral reef scientist, represented UNEP in the oceans working party, and was then seconded to the UNCED secretariat in Geneva to be responsible for the final drafting of chapter 17 on oceans, coastal areas and small islands, to ensure that the text was scientifically valid, responsive to the needs expressed by governments, and implementable. At that time, however, Keckes retired, and Dahl was transferred to the UN System-wide Earthwatch. Moreover, the new director of oceans and coastal areas from an important donor country had no scientific background or interest in international action, UNEP funding collapsed, and the Regional Seas Programmes were therefore left on their own without global leadership, some thriving with regional ownership and others struggling. This illustrates the importance of scientific expertise to environmental governance, the challenge of finding scientists with the ability to work across the science-policy interface, and the vulnerability of a small organization like UNEP to over-reliance on single individuals, leaving it with inadequate institutional memory to maintain momentum. The regional seas files, which enabled any staff member to follow through with any programme, were simply discarded.

UN System-wide Earthwatch

The efforts of UNEP to implement the environmental assessment (Earthwatch) part of the Stockholm Action Plan also demonstrate challenges in bringing coherence to the way the whole UN system interfaces science with policy. UNEP was given a catalytic role, but as a small and distant player among large and well-established agencies, it was often seen as a competitor and threat to established mandates. With the impossibility of building a true scientific capacity at UNEP headquarters, the alternative was to establish technical units closer to the science. In the rapidly developing field of remote sensing, the UNEP Global Resources Information Database (GRID) established centres in Arendal, Norway, Geneva, Switzerland, and Sioux Falls, South Dakota, the latter in partnership with the US Geological Survey Earth Resources Observation and Science Center. For chemicals, an

International Register of Potentially Toxic Chemicals was established in Geneva. UNEP took over the World Conservation Monitoring Centre in Cambridge, UK. UNEP had to develop the necessary science capacity where access to science was possible. At the same time, other scientific advisory processes were multiplying. UNEP partnered with the World Meteorological Organization (WMO) to establish the Intergovernmental Panel on Climate Change (IPCC) in 1988, and other conventions developed their own scientific advisory processes, as mentioned above.

This still left the challenge of the global overview of what was happening to the planetary environment, and how to coordinate the rapidly expanding technological capacities for environmental monitoring. In 1989, the UN General Assembly asked UNEP to strengthen its Earthwatch monitoring and assessment function, leading to several mentions of Earthwatch in Agenda 21, particularly in its chapter 40: Information for Decision-making. Since it was not practical to attempt to coordinate over 50 parts of the UN system from Nairobi, Dr. Arthur Dahl was posted to Geneva, Switzerland, in early 1992 as Coordinator, UN System-wide Earthwatch, and task manager for the Commission on Sustainable Development for chapter 40 of Agenda 21. While there were plans to have a supporting professional staff, the funding never materialized. He established a periodic interagency Earthwatch Working Party for coordination, inviting not only all UN agencies but also the International Science Council (then ICSU), IUCN and other NGOs with capacities in the relevant science.

Among the accomplishments of Earthwatch Coordination over the next eight years, a website assembled for the first time an overview of all UN efforts for environmental monitoring and assessment[21] and reviews were prepared of all scientific assessment activities for environment and sustainable development in the UN system including trends, gaps and recommendations (Fritz 2000). Earthwatch led the implementation of the Chapter 40 mandate to develop indicators of sustainable development, with technical meetings addressing both policy and technical issues in cooperation with the Scientific Committee on Problems of the Environment (SCOPE) of ICSU (Moldan, Billharz, and Matravers 1997; Hak, Moldan, and Dahl 2007; Dahl 2018). It contributed to the planning of Global Climate, Ocean and Terrestrial Observing Systems and their coordination, leading to an Integrated Global Observing Strategy (IGOS) with the Committee of Earth Observation Satellites (CEOS) generating various sectoral plans (DiGiacomo et al. 2006) that provided the foundation for the creation of the intergovernmental Group on Earth Observations (GEO). It also contributed to the initiation of the UNEP Global Environment Outlook (GEO) reports and other foresight assessments. Despite this successful example of UNEP's catalytic role, Earthwatch Coordination was abandoned in 2000 by the then UNEP Executive Director, who had a political background rather than a scientific one.

[*Arthur Dahl, the author of this appendix, participated in the Stockholm Conference, organized SPREP (1974-1982), was consultant to and then Deputy to the Director of the Oceans and Coastal Areas Programme Activity Centre under Stjepan Keckes (1986-1991) and Coordinator of the UN System-wide Earthwatch (1992-2000)*].

Endnotes

1 The review was carried out in the Scopus database. Details of the methodology for the review can be found in **Appendix 1**.
2 For comprehensive overviews of the state of the planet see, for example the latest assessments of the Intergovernmental Panel on Climate Change) (IPCC - **https://www.ipcc.ch/**), Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES - **https://ipbes.net/global-assessment**), and United Nations Environment Programme (UNEP) Global Environment Outlook 6 (**https://wedocs.unep.org/bitstream/handle/20.500.11822/27652/GEO6SPM_EN.pdf**), etc. (Accessed 28 September 2021).
3 On the dominance and impacts of a competitive culture see Karlberg (Karlberg 2004)
4 International Risk Governance Council,
https://beta.irgc.org/risk-governance/irgc-risk-governance-framework/
(Accessed 28 September 2021).
5 Many variations on this classification include (Oberthür, Hermwille, and Rayner 2021).
6 Based on personal observation of the authors who participated in the process.
7 Oberthür (Oberthür 2009) refers to this as interplay management and analyses the constraints for this in global environmental governance in detail.
8 The need for independent global funding sources is addressed by Augusto Lopez-Claros in a forthcoming report from the Global Challenges Foundation.
9 International Science Council,
https://www.ingsa.org/
(Accessed 28 September 2021).
10 A very recent proposal for an International Court for the Environment (ICE), **http://www.icecoalition.org/welcome** aiming to harness the law to protect the planet, was presented at a webinar on 26 February 2021 convened by the ICE Coalition and the Human Rights Institute of the International Bar Association: https://vimeo.com/518160409 (Accessed 28 September 2021). It considered how the legal system needs to adapt in order to combat environmental issues ahead of the United Nations Climate Change Conference due to be held in Glasgow in November 2021.
11 See Blagescu et al (2005) for an elaboration of these elements.
12 Lopez-Claros, A. 2021. Forthcoming report. Global Challenges Foundation.
13 This might be centred eventually in the Trusteeship Council with UN Charter reform to give it responsibility for the global commons and common property resources and services, also linked to an institution such as the proposed Global Resilience Council, with a deliberation and dispute negotiation function.
14 For example, the Convention Citoyenne pour le Climat in France,
https://www.conventioncitoyennepourleclimat.fr/
(Accessed 28 September 2021).
15 For more background on accountability pathways see Karlsson-Vinkhuzen et al. (2018).
16 Better Climate Governance,
https://betterclimategovernance.com/
(Accessed 28 September 2021).

17 Global Challenges Foundation. 2021. Governing Our Climate Future. Interim Report of The Climate Governance Commission, 2021. A GCF Report. Stockholm: Global Challenges Foundation.
https://globalchallenges.org/wp-content/uploads/2021/07/Governing-Our-Climate-Future-2021-10-06-logo.pdf
(Accessed 15 October 2021).
18 The first time there is an opportunity to build such a learning process is during the first global stocktake in 2022-2023 and in the following year when state should submit their next NDC.
19 See the proposal by Integrity Initiatives International for an International Anti-Corruption Court.
http://www.integrityinitiatives.org/international-anticorruption-court
(Accessed 28 September 2021).
20 Earth Negotiations Bulletin.
https://enb.iisd.org/
(Accessed 28 September 2021).
21 Archive at
http://yabaha.net/dahl/earthw.html
(Accessed 28 September 2021).

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