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Abstract

Global environmental governance in the Anthropocene is fundamentally different from older conceptions of environmental policy-making and sustainable development. Environmental problem-solving is no longer concerned with isolated problems, but rather with reorganising the overall relation between humans and natural systems. Empirically, this is reflected in the ever greater attention to questions of institutional interactions (e.g. between the issue areas of economics and environment) and functional overlaps between parallel governance approaches. Normatively, environmental governance in the Anthropocene is concerned with questions of equity and fairness on a finite planet. This article scrutinises the theoretical interregnum in global environmental governance by first sketching the key empirical trends in global environmental governance; secondly, discussing theory-building with regards to four broad areas of inquiry: the questions of agency and authority; the structural dimension of global environmental governance; the related normative questions about legitimacy, accountability, equity and fairness in the Anthropocene; and finally the integration of governance research into formal approaches and the related incorporation of non-social science concepts into environmental governance research. In our conclusions, we propose some initial ideas on how to move forward in the study of global (environmental) governance.

Keywords

global governance, environment, Anthropocene, fragmentation, authority, inter-disciplinarity

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Introduction

Surveying the theoretical 'interregnum' in the global governance of the environment (Global Environmental Governance, GEG), two central observations stand out: first, environmental governance at the beginning of the third millennium is fundamentally different from earlier periods of environmental policy-making as we are collectively entering the Anthropocene as an epoch of planetary-scale change. The term Anthropocene denotes a new geological period in planetary history, one that is characterised by the unprecedented impact of human activities on the Earth's ecosystems. In fact, humans have become the main drivers of planetary change. Largely as a result of unsustainable economic structures and practices, scientists today see mounting evidence that the entire earth system now operates well outside safe boundaries.[1] Societies are therefore urgently required to change course and stay clear of critical tipping points that might lead to rapid and irreversible change, while at the same time ensuring sustainable livelihoods for a growing human population.[2] But while the natural sciences have advanced their understanding of the drivers and processes of global change considerably over the last two decades, the social sciences lag behind in developing and implementing a coherent research paradigm to address this fundamental challenge of politics and governance in the Anthropocene. The key question from a social science perspective is how to organise the co-evolution of societies and their surrounding environment, while balancing between effectiveness and equitable and fair governance solutions for today's global challenges.

Second, our responses to environmental problems have been broadened significantly to reach beyond the confines of formal, legally binding and multilaterally negotiated agreements (so-called multilateral environmental agreements, MEAs) to include modes of regulation that are often transnational, informal and voluntary in character. Consequently, global environmental governance in the Anthropocene poses new and challenging questions to the analyst. Since the birth of global environmentalism in the 1960s and 70s, there has been a proliferation of cross-border environmental governance arrangements. The 1990s witnessed a 'golden age' in international norm-setting where the number and type of intergovernmental environmental regimes increased substantially and states adopted milestone MEAs such as the UN Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). Today, over 1100 MEAs[3] and an additional 1500 bilateral agreements govern intergovernmental relations across different environmental domains forming a dense web of environmental legislation. From 2000 onwards, however, far less MEAs have been adopted and a general 'stagnation' in international law has been observed.[4] Instead, the new millennium

1. Johan Rockström et al., 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity', *Ecology and Society* 14, no. 2 (2009): 32.
2. Frank Biermann et al., 'Navigating the Anthropocene: Improving Earth System Governance', *Science* 335, no. 6074 (2012): 1306–7.
3. Data from Ronald B. Mitchell. 2002–2014. International Environmental Agreements Database Project (Version 2013.2). Available at: http://iea.uoregon.edu/
4. Joost Pauwelyn, Ramses A. Wessel and Jan Wouters, *Informal International Lawmaking* (Oxford: Oxford University Press, 2012).

spawned a plethora of private and transnational institutions, public-private partnerships, private norms, and global public policy networks addressing environmental issues. As a result, we witness the emergence of a patchwork of governance arrangements at all levels of the world political system. In other words, the structural geography of global environmental governance has started to change. However, the implications of this governance transformation, both in terms of effectiveness to address the overarching challenge of sustainability and the resulting (re)configuration of political power are not well understood.

Against this background, our article first sketches the key empirical trends in global environmental governance, before it scrutinises theory-building with regard to four broad areas of inquiry: the questions of agency and authority; the structural dimension of global environmental governance; the related normative questions about legitimacy, accountability, equity and fairness in the Anthropocene; and finally attempts to better integrate governance research into the natural science dominated modelling and forecasting approaches along with a general discussion of the role of non-social science concepts in global environmental governance research. We contend that while the preoccupation with alternative spheres of authority and the normative turn in GEG are also reflected in other empirical domains of world politics, the move to study the wider institutional structures along with borrowing heavily from the natural sciences, in particular sustainability studies, is a distinctive feature of theorising global governance of the environment. In our conclusions we address some of the key questions posed by the editors of this special issue and offer some initial ideas on how to move forward in the study of global (environmental) governance.

Key Trends in GEG

Our attempts to take stock of contemporary theorising of governing the environment globally must start with an overview of the key empirical trends and developments that have become visible over the last one and a half decades as the main inputs to and background for theorising the interregnum.[5] Based on a well-established framing by Biermann and Pattberg,[6] we acknowledge three broad trends in GEG: (a) the proliferation of actors (new actors and new roles); (b) the emergence of new governance mechanisms and instruments (for example multi-stakeholder partnerships or global city networks to combat climate change); and (c) the resulting proliferation and intensified interaction of governance levels (e.g. sub-national and transnational) and functional arenas (e.g. public and private rule-making).

5. For a general discussion of the term global governance beyond the environmental field, cf. Matthias Hofferberth, 'Mapping the Meanings of Global Governance: A Conceptual Reconstruction of a Floating Signifier', *Millennium*, this issue.
6. Frank Biermann and Philipp Pattberg, 'Global Environmental Governance: Taking Stock, Moving Forward', *Annual Review of Environment and Resources* 33 (2008): 277–94.

New Actors

The first notable trend in the global governance of the environment is the increasing participation of actors that are not central governments and their bureaucracies. This multi-stakeholder governance[7] includes civil society organisations (CSOs), networks of experts (e.g. the Intergovernmental Panel on Climate Change), multinational corporations and global industry associations, but also new agencies set up by governments, including intergovernmental organisations and international courts. Novel is not simply the increase in numbers, but the ability of non-state actors to exercise authority in cross-border environmental politics.

On this account, agency – understood as the power of individual and collective actors to change the course of events or the outcome of processes – is increasingly located in sites beyond the state and intergovernmental organisations.[8] Many vital institutions of global environmental governance are today inclusive of, or even driven by, non-state actors. Non-governmental organisations have joined governments to put international norms into practice, for example as quasi-implementing agencies for development assistance programmes administered by the World Bank or bilateral agencies. Private actors, both for-profit and non-profit, also participate in global institutions to address environmental problems without being forced, persuaded or funded by states and other public agencies, for example in attempts to 'green' global commodity chains. This 'agency beyond the state' sets global environmental governance apart from more traditional international environmental politics based on inter-state bargaining and consensus.

New Mechanisms

The second trend in the global governance of the environment is the emergence of new institutions in addition to the traditional system of legally binding agreements negotiated and implemented by governments. More and more non-state actors become formally part of norm-setting and norm-implementing institutions and mechanisms in global governance, which denotes a shift from intergovernmental regimes to public-private and private-private global policy-making. Private actors became partners of governments in the implementation of international standards, for example as quasi-implementing agencies for many programmes of development assistance administered through the World Bank or bilateral agencies. At times, private actors venture to negotiate their own standards, such as in the Forest Stewardship Council or the Marine Stewardship Council, two rule-making bodies created by major corporations and environmental advocacy groups without direct involvement of governments. Public-private cooperation has received even more impetus with the 2002 Johannesburg World Summit on Sustainable Development and its focus on partnerships of governments, non-governmental organisations and the

7. Cf. Peter Newell, Philipp Pattberg and Heike Schroeder, 'Multiactor Governance and the Environment', *Annual Review of Environment and Resources* 37, no. 1 (2012): 365–87.
8. Eleni Dellas, Philipp Pattberg and Michele Betsill, 'Agency in Earth System Governance: Refining a Research Agenda', *International Environmental Agreements: Politics, Law and Economics* 11, no. 1 (2011): 85–98.

private sector – the so-called Partnerships for Sustainable Development. More than 330 such partnerships have been registered with the United Nations around or after the Johannesburg summit.

A number of conceptual terms have been suggested to analyse these new institutions in global environmental governance. Whereas the term 'transnational environmental regime' stresses the similarity to intergovernmental environmental regimes (with the difference that the norms, rules and decision-making procedures derive largely from cooperation between non-state actors), the terms public-private partnership, multi-stakeholder partnership or global public policy network are used to describe a more flexible and less institutionalised actor-constellation.

New Interactions

Third, and largely as a consequence of new actors and new regulatory instruments and mechanisms, we witness increased interaction among actors, institutions and policy levels. Global governance of the environment, in other words, is not limited to 'governance *that is* global' – that is, the coordination of activities that span the globe, at least in its aspiration,[9] but includes governance at all levels of the political system. The resulting system of multi-level governance is characterised by interdependencies among the different levels and overlaps in terms of regulatory content, normative commitments and actors involved.

Two observations might illustrate this trend. First, the increasing institutionalisation of global environmental governance does not occur without continuing policy making at national and subnational levels. Global standards need to be implemented and put into practice locally, and global norm-setting requires local decision making and implementation. This results in the coexistence of policy making at the subnational, national, regional and global levels in more and more issue areas, with the potential of both conflicts and synergies between different levels of regulatory activity. Second, a system of governance that is no longer organised along the principle of territoriality tends to create functional overlaps (with both positive and negative consequences) among the different levels. For example, while climate change is governed by an international legal convention under a target-and-timetables approach (i.e. the Kyoto Protocol established binding reduction targets for some states related to a certain base year, mitigation ambition and target year), subnational actors (municipalities) are organised in networks that also aim at mitigating greenhouse gas emissions. While the principle of territoriality would suggest that city commitments fall within the agreed national targets, multi-level governance perspectives stress the more complex nature of interaction among different scales of governance.

9. Cf. Henk Overbeek et al., 'Forum: Global Governance: Decline or Maturation of an Academic Concept?', *International Studies Review* 12, no. 4 (2010): 696–719; Robert Latham, 'Politics in a Floating World: Toward a Critique of Global Governance', *Approaches to Global Governance Theory* 23 (1999): 28.

Key Theoretical Debates

We argue that theory-building in the area of global environmental governance has reacted to the empirical trends outlined above by (a) discussing the changing nature of agency and authority; (b) scrutinising the changing structural geography of global environmental governance and its implications and potential remedies related to an increasingly complex governance architecture (e.g. debate about fragmentation and orchestration); (c) by integrating normative questions and research topics into the field (e.g. legitimacy, accountability, but also distribution, justice and fairness); and (d) by analysing the potential role of governance research for natural science dominated modelling and forecasting approaches. While these debates are identifiable in their own right, we also observe a trend towards an overarching conceptualisation of social science-oriented global environmental change research under the heading of 'earth system governance'.[10] What sets current theorising of the global governance of the environment apart from theorising a decade ago is first the move towards a more holistic approach to studying governance at different levels, and second the methodological challenge of better integrating governance scholarship in the natural science dominated research communities. We will in turn summarise the main arguments and findings for each of these research domains.

Agency – the Dispersion of Authority in Global Environmental Governance

The proliferation of actors involved in environmental governance that we have noted above is at the centre of much of the global governance literature of the last decade. The substantial rise in the number of non-state actors at the global level is often taken as proof that the nature of world politics has changed. However, it is not simply the increased numbers that make the difference. Instead, the ability of a broader set of actors to effectively steer particular aspects of the world political system in certain directions distinguishes global governance from traditional conceptions of international politics.[11] This new agency has been empirically scrutinized in the environmental arena with regard to a range of different actors, from certification organisations and environmental consultancies to social entrepreneurs and multinational corporations.[12]

Much scholarly effort has been focused on mapping and conceptualising the transforming political landscape of world politics at the beginning of the third millennium, which is increasingly characterised by a bifurcation into a state-centric world and a broadly complementary multi-centric transnational world that has some links to, but operates largely independently of, inter-state politics. The corresponding broadening of

10. Cf. Frank Biermann, ' "Earth System Governance" as a Crosscutting Theme of Global Change Research', *Global Environmental Change* 17, no. 3–4 (August 2007): 326–37.
11. James N. Rosenau and Otto Czempiel, *Governance without Government: Order and Change in World Politics* (Cambridge: Cambridge University Press, 1992).
12. Dellas et al., 'Agency in Earth System Governance'.

roles and responsibilities results in a densely populated arena of transnational governance of the environment. In the words of Thynne, an

> increasingly pertinent feature of the global public order in and beyond environmental protection and sustainability is the dynamic mixing of the public and the private, with state-based public power being exercised by state institutions alongside and along with the exercise of private power by market and civil society institutions and other actors committed to the public interest and public weal.[13]

In the same vein, Ruggie[14] has suggested that a new global public domain is emerging that carries features of an 'increasingly institutionalized transnational arena of discourse, contestation, and action concerning the production of global public goods, involving private as well as public actors'. Similar interpretations of a fundamental transformation of world politics (also beyond the environmental realm) are expressed in the English School's interest in the shift from international to world society,[15] in the literature on a legalisation of world politics in both its international and transnational dimensions,[16] the literature on private authority in world affairs,[17] Wapner's[18] concept of world civic politics and Falkner's analysis of 'private environmental governance' and its links to International Relations theory.[19] Theoretical accounts of this emerging field of transnational organisation and the many corresponding 'institutional arrangements that no longer predominantly focus on the international policy cycle, but have begun to develop, implement and monitor their own transnational rules and regulations'[20] have focused in particular on (a) the underlying explanations for the shift in authority and (b) assessments of its effectiveness and broader impacts (including normative questions, discussed in more detail in the section 'Normative Concerns – Legitimacy, Accountability and Fairness in Global Environmental Governance').

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13. Ian Thynne, 'Symposium Introduction – Climate Change, Governance and Environmental Services: Institutional Perspectives, Issues and Challenges', *Public Administration and Development* 28, no. 5 (1 December 2008): 329.
14. John Gerard Ruggie, 'Reconstituting the Global Public Domain – Issues, Actors, and Practices', *European Journal of International Relations* 10, no. 4 (2004): 499–531, 504.
15. Barry Buzan, *From International to World Society? English School Theory and the Social Structure of Globalisation*, vol. 95 (Cambridge: Cambridge University Press, 2004).
16. Kenneth W. Abbott et al., 'The Concept of Legalization', *International Organization* 54, no. 3 (1 July 2000): 401–19.
17. A. Claire Cutler, Virginia Haufler and Tony Porter, *Private Authority and International Affairs* (New York: Suny Press, 1999).
18. Paul Wapner, 'Politics beyond the State Environmental Activism and World Civic Politics', *World Politics* 47, no. 03 (1995): 311–40.
19. Robert Falkner, 'Private Environmental Governance and International Relations: Exploring the Links', *Global Environmental Politics* 3, no. 2 (1 May 2003): 72–87.
20. Philipp Pattberg and Johannes Stripple, 'Beyond the Public and Private Divide: Remapping Transnational Climate Governance in the 21st Century', *International Environmental Agreements: Politics, Law and Economics* 8, no. 4 (2008): 367–88, 368.

First, research in the field of GEG has paid considerable attention to the emergence of new governance mechanisms.[21] A major puzzle to solve is the observation that a number of governance initiatives have been institutionalised among actors that, according to standard behavioural logic, follow detrimental motivations for action (profit versus not-for-profit motives). In this context, scholars have observed the increasing similarities among transnational governance arrangements in terms of decision-making procedures, organisational structure and communication. Dingwerth and Pattberg[22] have identified a standard model of multi-stakeholder governance arrangements focusing on rule-making in the environmental sphere, arguing that the costly features of multi-stakeholder decision-making along with highly institutionalised organisational structures and communications focusing on process rather than outcome can be explained by an organisational field logic, wherein the density of interactions over time predicts the similarity among organisations.[23] Other studies have rather attempted to explain the hybridisation of environmental governance at the global level. Public-private governance arrangements are understood as prime examples of 'the institutionalization of hybrid authority at the international arena, beyond traditional forms of interaction between state and nonstate actors…'.[24] This hybridisation is explained as the result of two processes: first, the political and functional fragmentation of environmental regimes[25] and the proliferation of non-state actors (NSAs) have resulted in opportunities for cross-sector collaboration; second, international organisations have responded to the 'pluralization of global environmental politics'[26] by facilitating new collaborative arrangements with a range of actors. According to this view, the increase in flexible transnational governance arrangements is not so much the result of bottom-up initiative, but rather emerges from the conscious strategies of international public actors.

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21. Cf. Tim Bartley, 'Certifying Forests and Factories: States, Social Movements, and the Rise of Private Regulation in the Apparel and Forest Products Fields', *Politics & Society* 31, no. 3 (2003): 433–64; Philipp Pattberg, 'What Role for Private Rule-Making in Global Environmental Governance? Analysing the Forest Stewardship Council (FSC)', *International Environmental Agreements: Politics, Law and Economics* 5, no. 2 (2005): 175–89; Lars H. Gulbrandsen, 'The Emergence and Effectiveness of the Marine Stewardship Council', *Marine Policy* 33, no. 4 (2009): 654–60.
22. Klaus Dingwerth and Philipp Pattberg, 'World Politics and Organizational Fields: The Case of Transnational Sustainability Governance', *European Journal of International Relations* 15, no. 4 (2009): 707–43.
23. Cf. Madeline Carr, 'Power Plays in Global Internet Governance', *Millennium*, this issue, on multi-stakeholder partnerships in the area of Internet governance.
24. Liliana B. Andonova, 'Public-Private Partnerships for the Earth: Politics and Patterns of Hybrid Authority in the Multilateral System', *Global Environmental Politics* 10, no. 2 (1 May 2010): 25–53, 26.
25. Frank Biermann, Philipp Pattberg, Harro van Asselt and Fariborz Zelli, 'The Fragmentation of Global Governance Architectures: A Framework for Analysis', *Global Environmental Politics* 9, no. 4 (2009): 14–40.
26. Andonova, 'Public-Private Partnerships for the Earth', 26.

A second strand of research related to agency and authority has scrutinised the measurable effects (also beyond compliance and problem-solving) of novel and innovative governance instruments such as private rule-setting organisations, multi-stakeholder partnerships and global city networks. In this context, effectiveness can be understood as the degree to which the arrangement has solved the problem it was set up to address. While this seems to be a straightforward approach, measuring the concrete sustainability impact of governance arrangements is difficult for a number of reasons. First, while many arrangements address an identifiable governance deficit, they are embedded in broader socio-economic developments that they rarely control. Second, many transnational arrangements do not target environmental or sustainability indicators directly, but often focus on information disclosure and public awareness raising (see below for a detailed discussion of this aspect of sustainability governance). While these mechanisms are acknowledged to improve environmental performance, establishing causality remains a major research challenge.

Consequently, studies focus on the rate of standard-uptake and rule-compliance as a proxy for the problem-solving effectiveness of multi-stakeholder governance arrangements and thereby potentially run the risk of concluding that rules and norms that emerge from multi-stakeholder governance arrangements are, by and large, epiphenomena and can be neglected in accounts of world politics.[27] However, since many such initiatives are created precisely because of a governance vacuum left by the absence of effective public policy, direct comparison of effectiveness is difficult to undertake. More recent research, moreover, contends that transnational governance has considerable effects, both intended and unintended, that reach beyond direct regulation through rules and standards.[28]

In terms of the problem-solving effectiveness of multi-stakeholder partnerships for sustainable development (a broad category that includes more or less institutionalised cooperation among actors from the public, private and non-profit realms), the overall picture that emerges is rather sobering. Multi-stakeholder partnerships have, by and large, not lived up to their promise. There are certainly some that perform excellently and have had impressive impacts on their issue areas but these should be considered as anomalies. For example, health related partnerships (such as the GAVI Alliance that attempts to enhance the dissemination of immunisation or the Global Fund to Fight AIDS, Tuberculosis and Malaria) have been highly effective in realising their goals and enticing behavioural change.[29] On the other hand, a recent large-*n* analysis of more than

27. Kelly Kollman and Aseem Prakash, 'Green by Choice? Cross-National Variations in Firms' Responses to EMS-Based Environmental Regimes', *World Politics* 53, no. 03 (2001): 399–430.
28. Cf. Agni Kalfagianni and Philipp Pattberg, 'Fishing in Muddy Waters: Exploring the Conditions for Effective Governance of Fisheries and Aquaculture', *Marine Policy* 38 (March 2013): 124–32.
29. Marianne Beisheim and Andrea Liese, *Transnational Partnerships: Effectively Providing for Sustainable Development?* (Basingstoke: Palgrave Macmillan, 2014); Pattberg, 'What Role for Private Rule-Making in Global Environmental Governance?'.

340 partnerships that have been agreed upon at the 2002 WSSD shows a disappointingly low level of effectiveness.[30]

With regards to global city networks, research has highlighted the relevance of municipalities (i.e. public non-state actors) such as the US Conference of Mayors' Climate Protection Agreement or C40. Their message is that local governments and municipalities take on global responsibility ahead of and beyond that of their national or state governments. Beyond this rhetoric, evidence for concrete measurable impacts is scarce. Research has rather emphasised the soft and intangible results of city networks in solving environmental problems, such as increased access to relevant technical information and policy learning.[31]

Theorising the agency and authority of actors 'beyond the state' has become a prime occupation for global environmental governance scholarship over the past 15 years. While this preoccupation with 'non-state', 'private' and 'transnational' forms of governance can hardly be considered a new trend, it is arguably here where GEG research had most impact on other areas of study. As Orsini, Morin and Young[32] illustrate in a recent forum for International Studies Review, studying governance beyond the state has occurred more frequently with regards to the environment than to other issues areas of world politics. While articles about non-state actors make up around 8 per cent of all publications in Global Environmental Politics for the period of 2001 to 2012, this figure is only 0.8 per cent and 2.3 per cent for International Organization and International Studies Quarterly, respectively.[33] Given this clear focus on non-state governance (if we include articles on business actors, scientists and social movements, the figure for GEP stands at almost 30 per cent), it is hardly surprising that environmental governance scholarship has produced key insights into the private authority question.

Structure – Fragmentation in the Global Governance Architecture

The structure, or architecture, of today's global environmental governance is, in fact, unstructured. It is not organised around a coherent set of rules and decision-making procedures which governs an issue area in a top-down manner. The architecture is instead constituted by a myriad of international and transnational institutions that interact and overlap both vertically and horizontally, often with unexpected and unexplored outcomes. It is fragmented and GEG has become 'a patchwork of international institutions that are different in their character (organisations, regimes, and implicit norms), their

30. Philipp Pattberg et al., *Public–Private Partnerships For Sustainable Development: Emergence, Influence and Legitimacy* (Cheltenham: Edward Elgar, 2012).
31. Michele M. Betsill and Harriet Bulkeley, 'Transnational Networks and Global Environmental Governance: The Cities for Climate Protection Program', *International Studies Quarterly* 48, no. 2 (2004): 471–93.
32. Amandine Orsini, Jean-Frédéric Morin, and Oran R. Young, 'Regime Complexes: A Buzz, a Boom, or a Boost for Global Governance?', *Global Governance: A Review of Multilateralism and International Organizations* 19, no. 1 (2013): 27–39.
33. Ibid., 564.

constituencies (public and private), their spatial scope (from bilateral to global), and their subject matter (from specific policy fields to universal concerns)'.[34] The main challenge for scholars and decision-makers is to make sense of fragmentation in the architecture of GEG, its implications for effectiveness, legitimacy and management options.[35]

A pervasive feature of fragmentation is the diffusion of authority to international and transnational institutions. However, the 'international' and the 'transnational' have been largely separated both in academia and in practice. States, in particular from the global south, are vigorously defending state authority in the UN-system and public engagement with already existing forms of private sustainability governance remained almost completely off the Rio+20 agenda.[36] Scholars divide the public and private by treating them as if they operate in separate dimensions. For example, while mappings of the institutional structure of global climate change governance are being published on a nearly annual basis,[37] they focus on either the international level or the transnational level, but rarely connect the two. Hence, we still lack a comprehensive empirical understanding of how international institutions interact with transnational institutions, let alone a prescriptive normative understanding of how they *should* interact. In fact, while actors and institutions have proliferated, evidence is undisputable that the way we organise our response to the challenges in the Anthropocene is not yielding the necessary results and a deeper transformation is needed at both national and international levels to return to a 'safe operating space'.[38]

The shortcomings of the existing architecture of GEG raise questions about effectiveness and problem-solving capacity of global institutions. While effectiveness has been extensively studied over the past 20 years within the conceptual framework of international environmental regimes,[39] it is almost exclusively assessed from the perspective of discrete, coherent, normative frameworks governing specific issue areas. Fragmentation, however, requires us to pay more attention to the interactions between different institutional structures and resulting impacts on effectiveness, problem-solving, legitimacy and accountability. And while some attempts have been

34. Biermann et al., 'The Fragmentation of Global Governance Architectures', 18.
35. Fariborz Zelli and Harro van Asselt, 'Introduction: The Institutional Fragmentation of Global Environmental Governance: Causes, Consequences, and Responses', *Global Environmental Politics* 13, no. 3 (22 July 2013): 1–13.
36. Kenneth W. Abbott, 'Engaging the Public and the Private in Global Sustainability Governance', *International Affairs* 88, no. 3 (2012): 543–64.
37. Robert O. Keohane and David G. Victor, 'The Regime Complex for Climate Change', *Perspectives on Politics* 9, no. 1 (2011): 7–23; Kenneth W. Abbott, 'The Transnational Regime Complex for Climate Change', *Environment & Planning C: Government & Policy* 30, no. 4 (2012): 571–90; Thomas N. Hale and Charles Roger, 'Orchestration and Transnational Climate Governance', *The Review of International Organizations* 9, no. 1 (2014): 59–82.
38. Biermann et al., 'Navigating the Anthropocene'; Rockström et al., 'Planetary Boundaries'.
39. Cf. P. M. Haas, Robert O. Keohane, and M. A. Levy, *Institutions for the Earth: Sources of Effective International Environmental Protection* (Cambridge, MA: MIT Press, 1993); E. L. Miles et al., *Environmental Regime Effectiveness: Confronting Theory with Evidence* (Cambridge, MA: MIT Press, 2001).

made to consider institutional interaction, they are by and large limited to dyadic relations between regimes.[40]

Moreover, there is large disagreement about how to improve the structure of GEG. These differences are underpinned and sustained by diverging descriptions on how to characterise the current fabric of global environmental governance. Three distinct conceptions are visible in the field of GEG.[41] First, a popular conception is to describe the world in terms of 'regime complexes' defined as 'an array of partially overlapping and non-hierarchical institutions governing a particular issue-area'.[42] The global climate change regime complex, for example, lacks an institutional core or hierarchy but its parts are loosely coupled in various ways.[43] The perspective builds on neo-liberal institutionalism and is a continuation of regime theory in International Relations scholarship, which has dominated global environmental governance studies over the past 30 years, and borrows from it analytical concepts such as interests and functions.[44] The normative conclusion of scholars that adhere to regime complexes as a valid description for the structural geography of global environmental governance is that we should defer from trying to create a comprehensive integrated regime and instead try to manage it through, for example, 'orchestration', where actors such as international organisations or states could take a management role in coordinating other actors and institutions to effect targets.[45]

Second, a number of scholars prefer to use the term 'architecture' instead of regime complexes. Architecture emphasises the political aspects of global governance structures by arguing that power and interests do not necessarily lead to an apolitical 'complex' of regimes, but that architecture is a result of intentional actions by purposeful actors. Some states, for example, are likely to gain from institutional fragmentation and engage in forum-shopping or forum-shifting to find the institution which best suits their interests.[46]

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40. Oran R. Young, Sebastian Oberthür and Thomas Gehring, *Institutional Interaction in Global Environmental Governance: Synergy and Conflict among International and EU Policies* (Cambridge, MA: MIT Press, 2006); Thomas Gehring, 'The Institutional Complex of Trade and Environment: Toward an Interlocking Governance Structure and a Division of Labor', in *Managing Institutional Complexity: Regime Interplay and Global Environmental Change*, eds Sebastian Oberthür and Olav Schram Stokke (Cambridge, MA: MIT Press, 2011), 227–54.
41. James H. Mittelman, 'Global Bricolage: Emerging Market Powers and Polycentric Governance', *Third World Quarterly* 34, no. 1 (2013): 23–37 for a broader view.
42. Kal Raustiala and David G. Victor, 'The Regime Complex for Plant Genetic Resources', *International Organization*, Spring (2004): 277–309.
43. Keohane and Victor, 'The Regime Complex for Climate Change'.
44. Stephen D. Krasner, *International Regimes* (Ithaca, NY: Cornell University Press, 1983); Oran R. Young, 'Regime Dynamics: The Rise and Fall of International Regimes', *International Organization* 36, no. 2 (1 April 1982): 277–97.
45. Abbott, 'The Transnational Regime Complex for Climate Change'; Tom Pegram, 'Governing Relationships: The New Architecture in Global Human Rights Governance', *Millennium*, this issue.
46. K.J. Alter and S. Meunier, 'The Politics of International Regime Complexity', *Perspectives on Politics* 7, no. 1 (2009): 13–24; A. Kellow, 'Multi-Level and Multi-Arena Governance: The Limits of Integration and the Possibilities of Forum Shopping', *International Environmental Agreements: Politics, Law and Economics* 12, no. 4 (2012): 327–42.

New institutions are not simply the result of functional gaps being filled in the governance structure but partly the result of political motives. Van de Graaf[47] describes this phenomenon in his analysis of the emergence of the International Renewable Energy Agency (IRENA), sketching the political games involved in its creation. The policy recommendations emerging from this perspective are more sensitive to issues of legitimacy and fairness, which could potentially be better safe-guarded under one comprehensive legal regime.

Third, there is a growing interest in describing the world as polycentric. The strand of thought is essentially an application of Ostrom's work on institutions at the local level to the global level[48] and connected to understandings of the world in terms of complex socio-ecological systems where concepts such as adaptation and resilience take centre stage.[49] Proponents of polycentrism highlight that fragmentation does not equal anarchy and there are reasons to believe that systems have the capacity to self-organise between difference centres of decision-making that, in principle, are independent from each other.[50]

The stagnation in international law-making and the rise of transnational institutions and actors have prompted scholars to revisit their theories on GEG on how to describe the very nature of the structure, and the mechanisms behind how and why it has emerged, the implications for effectiveness and legitimacy, and management options. Interestingly, the different characterisations of the contemporary structure of GEG leads to diverging proscriptions on the best way forward. A methodological challenge is that all three strands outlined above move from theory to practice by substantiating theoretical claims by empirical evidence (see also the section 'Governance Theory and Interdisciplinarity').

New approaches and methods in the social sciences could allow us to move from theorising about structure to empirical testing and measurement. One promising field is the use of network analysis to complement the qualitative approaches.[51]

47. Thijs Van de Graaf, 'Fragmentation in Global Energy Governance: Explaining the Creation of IRENA', *Global Environmental Politics* 13, no. 3 (22 July 2013): 14–33.
48. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990); Elinor Ostrom, 'Beyond Markets and States: Polycentric Governance of Complex Economic Systems', *American Economic Review* 100, no. 3 (2010): 641–72.
49. C. Folke, S. R. Carpenter, B. Walker, M. Scheffer, T. Chapin, and J. Rockström, 'Resilience Thinking: Integrating Resilience, Adaptability and Transformability', *Ecology and Society* 15, no. 4 (2010): 20; Carl Folke, Thomas Hahn, Per Olsson and Jon Norberg, 'Adaptive Governance of Social-Ecological Systems', *Annual Review of Environmental Resources* 30 (2005): 441–73.
50. V. Galaz, B. Crona, H. Österblom, P. Olsson and C. Folke, 'Polycentric Systems and Interacting Planetary Boundaries – Emerging Governance of Climate Change–Ocean Acidification–Marine Biodiversity', *Ecological Economics* 81 (2011): 21–32.
51. Emilie M. Hafner-Burton, Miles Kahler and Alexander H. Montgomery, 'Network Analysis for International Relations', *International Organization* 63, no. 03 (2009): 559–92; Örjan Bodin and Christina Prell, *Social Networks and Natural Resource Management: Uncovering the Social Fabric of Environmental Governance* (Cambridge: Cambridge University Press, 2011).

Green,[52] for example, combines network analysis with qualitative methods to show how public and private rules for carbon management interact, and Kim[53] has been able to re-create the entire international legal system governing the environment by using longitudinal data to create a network. Network analysis thus holds much promise in unveiling linkages between institutions, actors, norms and discourse, but should, of course, be used with utmost care, considering both methodological constraints as well as difficulties in interpreting results.

Normative Concerns – Legitimacy, Accountability and Fairness in Global Environmental Governance

As a reaction to the observed increasing relevance of non-state actors in governing the environment and the underlying social and economic dimensions of global change, there is a growing interest in normative issues in GEG, embodied in terms such as legitimacy, transparency, accountability and fairness.[54] The most commonly used lens for normative inquiries in GEG has been democratic legitimacy, defined as the acceptance and justification of shared rule by a community.[55] Liberal democratic theory provides a framework for structuring rights and rules between the governing and the governed based on fundamental principles including human rights, freedom to make decisions, and the possibility to change governing system. To uphold these values, information access and other procedural mechanisms are required that enable people to hold those that govern accountable for their actions. Central conceptualisations of democratic legitimacy – including participation, representation, deliberation, inclusiveness and accountability – have been used as proxies for assessing the degree of legitimacy and fairness in GEG.[56]

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52. Jessica F. Green, 'Order Out of Chaos: Public and Private Rules for Managing Carbon', *Global Environmental Politics* 13, no. 2 (25 March 2013): 1–25.
53. Kim Rakhyun, 'The Emergent Network Structure of the Multilateral Environmental Agreement System', *Global Environmental Change* 23, no. 5 (2013): 980–91.
54. Frank Biermann and Aarti Gupta, 'Accountability and Legitimacy in Earth System Governance: A Research Framework', *Ecological Economics* 70, no. 11 (15 September 2011): 1856–64; Steven Bernstein, 'Legitimacy in Global Environmental Governance', *Journal of International Law and International Relations* 1, no. 1–2 (2004): 139–66, 139; Aarti Gupta, 'Transparency in Global Environmental Governance: A Coming of Age?', *Global Environmental Politics* 10, no. 3 (1 August 2010): 1–9; Karin Bäckstrand, 'Multi-Stakeholder Partnerships for Sustainable Development: Rethinking Legitimacy, Accountability and Effectiveness', *European Environment* 16, no. 5 (2006): 290–306; Jekwu Ikeme, 'Equity, Environmental Justice and Sustainability: Incomplete Approaches in Climate Change Politics', *Global Environmental Change* 13, no. 3 (October 2003): 195–206.
55. Bernstein, 'Legitimacy in Global Environmental Governance', 142.
56. Karin Bäckstrand, Sabine Campe, Sander Chan, Aysem Mert and Marco Schäferhoff, 'Transnational Public–Private Partnerships', in *Global Environmental Governance Reconsidered*, eds F. Biermann and P.H. Pattberg (Cambridge, MA: MIT Press, 2012), 123–48.

Empirical analyses have scrutinised these questions with regard to multi-stakeholder partnerships that have emerged out of the 2002 World Summit on Sustainable Development[57] and a range of transnational multi-stakeholder rule-making organisations in the sustainability realm.[58] The overall conclusion is that multi-stakeholder governance arrangements do not automatically close the legitimacy gap in global governance, but rather display a wide variation in terms of democratic qualities. Finally, there is an ongoing discussion whether legitimacy is conducive for effectiveness. Intuitively, an inclusive attitude for new members in the partnership bolsters legitimacy. Also social constructivists argue that compliance and commitment increase when organisations internalise norms and engage in organisational and institutional learning.[59] However, there is little evidence to date that inclusiveness is linked to effectiveness.[60]

Biermann and Gupta[61] identify the process of globalisation as a major driving force for the search for accountable and legitimate governance, strengthening the need for new rule-making institutions at all levels of the political system. In their words:

> the complexities of globalization have also given rise to a stronger political role for actors beyond the nation-state, from multinational corporations and transnational advocacy groups to science networks and global coalitions of municipalities.[62]

This stronger role of non-state actors in the search for accountable and legitimate global environmental governance has been empirically studied in issue areas ranging from global forest governance to corporate sustainability reporting and networked climate governance. Chan and Pattberg[63] highlight the transformative shift from 'old' accountability systems (based on public actors and formal processes) to 'new' accountability systems that display a networked character that is induced by a change in the number, types and capacities of actors, the observable shortcomings in addressing global public concerns, changes in the problem-framing and broader ideological shifts. Newell[64] tracks these shifts in terms of the changing targets of CSO activism, from a focus on

57. Newell et al., 'Multiactor Governance and the Environment'.
58. Klaus Dingwerth, *The New Transnationalism: Transnational Governance and Democratic Legitimacy* (Basingstoke: Palgrave Macmillan, 2007).
59. Jeffrey T. Checkel, 'The Constructive Turn in International Relations Theory', *World Politics* 50, no. 02 (1998): 324–48.
60. Andrea Liese and Marianne Beisheim, 'Transnational Public-Private Partnerships and the Provision of Collective Goods in Developing Countries', *Governance Without a State? Policies and Politics in Areas of Limited Statehood*, ed. T. Risse (New York: Columbia University Press, 2011), 115–43.
61. Biermann and Gupta, 'Accountability and Legitimacy in Earth System Governance'.
62. Ibid., 1856.
63. Sander Chan and Philipp Pattberg, 'Private Rule-Making and the Politics of Accountability: Analyzing Global Forest Governance', *Global Environmental Politics* 8, no. 3 (2008): 103–21.
64. Peter Newell, 'Civil Society, Corporate Accountability and the Politics of Climate Change', *Global Environmental Politics* 8, no. 3 (2008): 122–53.

inter-governmental fora such as conferences of the parties to international legal conventions, to directly targeting the activities of the private sector, given the importance of its investment decisions. The rationale behind this change in strategy is the observation that reductions in, for example, greenhouse gas emissions, can be brought about within the shortest time frame by targeting those whose everyday decisions exert a strong and direct impact on emissions (e.g. companies, institutional investors, banks).

Within this broader context of accountability and legitimacy, the concrete mechanisms of transparency and disclosure in and through multi-stakeholder arrangements have received specific attention. Case studies on the Global Reporting Initiative (GRI), the leading global standard for profit and non-profit sustainability reporting, confirm that the GRI has had limited impact on balance of power in corporate governance.[65] Consequently, Dingwerth and Eichinger[66] conclude that the hope for transformative change induced by disclosure-based governance mechanisms is premature. Reflecting more generally on the potential of institutional investors (mutual funds, pension funds and insurers) to use disclosed information in their investment decisions, Harmes[67] suggests such potential has been considerably over-estimated because of the structural constraints faced by most institutional investors. The global reach of such initiatives is often limited with the majority of signatories to the United Nations Environment Programme Statement of Environmental Commitment by the Insurance industry, for example, being based either in Europe or Japan.

Environmental degradation is, by and large, a result of unsustainable consumption and production patterns which in turn lead to traditionally perceived economic growth and wealth (as measured by indicators such as gross domestic product, GDP). Since wealth is (increasingly) unequally distributed within and among societies, favouring a smaller group of people,[68] and the responsibility for environmental degradation being largely attributable to high consuming global elites,[69] the historical environmental debt is skewed towards a minority of the global population. Current and future consumption, however, is driven by the rise of a large middle-class in fast-growing developing countries, notably in China, expecting an equally high standard of living as in developed countries. At the same time, the negative effects of unsustainable consumption and production in the Anthropocene are likely to disproportionately affect poor and vulnerable people, such as in sub-Saharan Africa. The unequal distribution of the burden and benefits from

65. Halina Szejnwald Brown, Martin de Jong and David L. Levy, 'Building Institutions Based on Information Disclosure: Lessons from GRI's Sustainability Reporting', *Journal of Cleaner Production* 17, no. 6 (2009): 571–80.
66. Klaus Dingwerth and Margot Eichinger, 'Tamed Transparency: How Information Disclosure under the Global Reporting Initiative Fails to Empower', *Global Environmental Politics* 10, no. 3 (2010): 74–96.
67. Adam Harmes, 'The Limits of Carbon Disclosure: Theorizing the Business Case for Investor Environmentalism', *Global Environmental Politics* 11, no. 2 (2011): 98–119.
68. Thomas Piketty, *Capital in the Twenty-First Century* (Boston, MA: Harvard University Press, 2014).
69. Safa Motesharrei, Jorge Rivas, and Eugenia Kalnay, 'Human and Nature Dynamics (HANDY): Modeling Inequality and Use of Resources in the Collapse or Sustainability of Societies', *Ecological Economics* 101 (2014): 90–102.

unsustainable production and consumption is deeply intertwined with mitigating global environmental problems. Consequently, research questions regarding justice, equity, access and allocation belong to the key global challenges of the Anthropocene.[70]

Governance Theory and Interdisciplinarity

A distinct characteristic of current theorising in the field of GEG is its changing relationship with other disciplines. We observe a dual trend of borrowing concepts from other disciplines while at the same time furthering the integration of governance-specific knowledge into other disciplinary realms. Despite the aim to understand the co-evolution of society and the environment, theorising in global environmental governance has by and large focused on the human component. Social scientists have measured effectiveness by output (number and stringency of rules and norms) and outcome (behavioural change), but not in terms of impact (change in environmental quality) mainly due to challenges in establishing causal chains between outcome and impact, in particular at a global level. At the same time scientists engaged in earth system analysis have made tremendous progress in developing integrated assessment models (IAMs) to simulate the relationship between the earth's natural systems andeconomic, demographic and energy indicators. However, while the Anthropocene calls for new strategies in earth system management and governance,[71] governance has largely remained a 'black box' in IAMs. We will briefly touch upon both developments, the borrowing from other fields and the increasing integration of core findings of environmental governance research into formal modelling approaches.[72]

The attempt to combine IAM's with governance research is an excellent example of how global environmental research is moving towards more interdisciplinary approaches both within the social sciences and between the social and the natural sciences. Increasingly, scholars cooperate across disciplinary borders and borrow concepts and ideas from each other. A particularly prominent trend in the social sciences is to apply concepts and ideas from natural sciences including ecology, biology and systems thinking to formulate both

70. Heike Schroeder, 'Governing Access and Allocation in the Anthropocene', *Global Environmental Change* 26 (May 2014): A1–A3.
71. Frank Biermann, P. Pattberg and F. Zelli, *Global Climate Governance beyond 2012: Architecture, Agency and Adaptation* (Cambridge: Cambridge University Press, 2010).
72. Bert J.M. De Vries and Arthur C. Petersen, 'Conceptualizing Sustainable Development: An Assessment Methodology Connecting Values, Knowledge, Worldviews and Scenarios', *Ecological Economics* 68, no. 4 (2009): 1006–19; M.G. de Vos, P.H.M. Janssen, M.T.J. Kok, S. Frantzi, E. Dellas, P. Pattberg, A.C. Petersen and F. Biermann, 'Formalizing Knowledge on International Environmental Regimes: A First Step towards Integrating Political Science in Integrated Assessments of Global Environmental Change', *Environmental Modelling & Software* 44 (2013): 101–12; Eleni Dellas and Philipp Pattberg, 'Assessing the Political Feasibility of Global Options to Reduce Biodiversity Loss', *International Journal of Biodiversity Science, Ecosystem Services & Management* 9, no. 4 (2013): 347–63; Detlef P. Van Vuuren, M.T.J. Kok, B. Girod, P.L. Lucas and B. de Vries, 'Scenarios in Global Environmental Assessments: Key Characteristics and Lessons for Future Use', *Global Environmental Change* 22, no. 4 (2012): 884–95.

descriptive and prescriptive statements about GEG. Buzzwords such as organisational evolution, complexity, tipping points and governance niches suggest that human relations can be likened to an ecosystem found in nature. For example, research on Social-Ecological Systems (SES) has homed in on the concept of resilience as a guiding principle,[73] implying the policy message that societies that can resist or cope with abrupt change and crisis by, for example, fostering adaptation, learning and experimentation.[74]

The cross-fertilisation between disciplines and of concepts holds both promises and perils. Systems thinking could yield new knowledge on how humans interact with the environment by identifying drivers, impacts and feedback loops between the two systems. It suggests that we can make use of methods and techniques for measuring human-nature interaction which would allow for more precise identification of causal pathways and testing of hypotheses. The emergence of network-based approaches is a good example, where the structural qualities of global governance architectures are being measured by formal methods to assess the level of institutional fragmentation.[75] In the same vein, the concept of polycentrism – which suggests that global governance is constituted by self-organising networks acting across different levels and scales – promotes new ways to characterise and think about global environmental governance by moving away from hierarchical, top-down, decision-making towards more tailor-made and decentralised solutions. Ostrom, for example, builds her theories on decades of empirical research in natural resource governance showing how local collective action has been able to successfully preserve a resource such as a forest or water source and avoid a 'tragedy of the commons', which suggests the actions of self-interested individuals ultimately leads to the depletion of common resources.[76]

However, the trend of adopting concepts from natural sciences should be critically examined for a number of reasons. First, the use of concepts from the natural sciences often connotes to self-organising processes and overlooking concepts such as power, interest and justice which have been proven central explanatory variables in International Relation's theory. It often seems to underestimate agency and instead emphasises structural change driven by exogenous factors such as technology or simply 'evolution', rather

73. C.S. Holling, 'Resilience and Stability of Ecological Systems', *Annual Review of Ecology and Systematics* 4 (1973): 1–23; B. Walker, C.S. Holling, S.R. Carpenter and A. Kinzig, 'Resilience, Adaptability and Transformability in Social–Ecological Systems', *Ecology and Society* 9, no. 2 (2004): 5.
74. Carl Folke, S. Carpenter, T. Elmqvist, L. Gunderson, C.S. Holling and B. Walker, 'Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations', *AMBIO: A Journal of the Human Environment* 31, no. 5 (2002): 437–40.
75. Kim Rakhyun, 'The Emergent Network Structure of the Multilateral Environmental Agreement System'; Philipp Pattberg, Oscar Widerberg, Marija Isailovic and Flávia Dias Guerra, *Mapping and Measuring Fragmentation in Global Governance Architectures: A Framework for Analysis* (Amsterdam: IVM Institute for Environmental Studies, 2014).
76. Elinor Ostrom, 'Polycentric Systems for Coping with Collective Action and Global Environmental Change', *Global Environmental Change* 20, no. 4 (October 2010): 550–57; G. Hardin, 'The Tragedy of the Commons', *Science* 162, no. 3859 (1968): 1243–48.

than the result of power asymmetries and configuration of interests. Second, the focus on resilience implies that status quo is desirable. However, drastic change is sometimes needed to address a global problem. Third, the reliance on self-organising units and networks in society bides the question: How to ensure that the aggregate actions are sufficient? This is evident in current global climate governance discussions, where self-organised approaches such as multi-stakeholder partnerships and smaller groups of countries are increasingly being promoted to fill the ambitions gap between national pledges to mitigate greenhouse gas emissions under the UNFCCC and the cuts necessary to put us on a safe path to limit warming to 2 degrees Celsius. However, no one knows if the non-UNFCCC actions are adequate to fill the emissions gap.[77] Fourth, it is unclear if insights gained at local levels or in other disciplines and systems can be aggregated to the global level and the anarchic conditions in world affairs. For example, people living close to a natural resource are arguably more likely to engage in collective action to save a common good than are people for whom the impact of actions are felt far away in time and space.

Conclusions and Future Questions

In this contribution, we have summarised contemporary theorising and conceptualisation to make sense of global environmental governance in the Anthropocene. Our endeavour must necessarily remain piecemeal as the academic field has considerably broadened from its coherent beginnings as the study of international environmental regimes to its current outlines. We summarise our findings along a number of key themes that we believe to be important before we propose three areas for future research.

Interdisciplinarity and Global Governance Research. In the context of governance in the Anthropocene, we observe that a number of fruitful cross-fertilisations have occurred between disciplines involved in studying global change. For one, key concepts from ecology and biology have entered the governance domain, ranging from tipping-points and resilience to the idea of 'populations of governance organisations' that can be studied from the perspective of an organisational ecology. Lending concepts from other disciplines, however, should be carried out with caution and researchers ought to engage in critically examining the validity as well as the normative questions that arises from this behaviour. A central future research theme should thus be to test the assumptions and claims made by, for example, resilience researchers on empirical cases.

Governance, on the other hand, has become a central concept in the broader field of earth system sciences. The popularity of the concept of earth system governance is a key case in point.[78] New methods and approaches such as network analysis and integrated assessment modelling should be further explored to investigate how insights in governance

77. Oscar Widerberg and Philipp Pattberg, 'International Cooperative Initiatives in Global Climate Governance: Raising the Ambition Level or Delegitimizing the UNFCCC?', *Global Policy*, forthcoming.
78. Biermann, ' "Earth System Governance"'.

research can be combined with more formal approaches. For this to happen, there needs to be a continuous collaboration between social scientists and natural scientists from different disciplines.

Performance and Effectiveness of Governance Arrangements. Governance arrangements in the field of the environment have diversified considerably over the last 20 years. Next to multilateral cooperation in the form of binding agreements (e.g. UNFCCC) or political declarations (the Agenda 21), a plethora of new and innovative organisational forms have emerged, utilising various instrumental approaches to globally governing the environment. While there is a broad agreement among scholars of global environmental governance that such novel arrangements as the Forest Stewardship Council, the Carbon Disclosure Project or the C40 Cities Climate Leadership Group have proliferated and become more visible, a conclusive statement about their effectiveness is still missing. What we conclude is that while performance varies considerably among individual initiatives (take, for example, the huge variation in measurable performance among the more than 350 multi-stakeholder partnerships for sustainable development that have been announced after the 2002 Johannesburg Summit), additional and often unintended side-effects of governance beyond the state has been reported in numerous studies. This finding calls for greater initiative to evaluate the 'bigger picture' in transnational governance, moving away from studies that scrutinise performance in isolation from the broader governance context (i.e. the overarching public and private governance architecture of an issue area).[79]

Global Governance as a Conceptual Lens. Provided that the global governance paradigm (or any paradigm for that matter) is applied in a descriptive rather than normative fashion (for a discussion of the different usages of the global governance concept, see Dingwerth and Pattberg),[80] it opens a number of interesting avenues for inquiry about problem-solving in the Anthropocene. First, through its focus on 'governance *that is* global' (see the section 'New Interactions' above), it provides a useful heuristic for studying steering at multiple-levels without losing the necessary systems perspective. Second, by broadening the scope of instruments and approaches beyond formal and legal interventions, the global governance heuristic acknowledges the transformed nature of contemporary politics. While there surely are a number of problematic shortcomings (for an elaboration, see the special forum on global governance in International Studies Review; cf. Overbeek et al.),[81] judging from the immense richness of current research under the governance paradigm, we must conclude that the concept has not yet reached its intellectual zenith.

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79. Biermann et al., 'The Fragmentation of Global Governance Architectures'; Keohane and Victor, 'The Regime Complex for Climate Change'.
80. Klaus Dingwerth and Philipp Pattberg, 'Global Governance as a Perspective on World Politics', *Global Governance: A Review of Multilateralism and International Organizations* 12, no. 2 (2006): 185–203.
81. Overbeek et al., 'Forum'.

Global Governance and the Contemporary Transformation of World Politics. The emerging discussions about fragmentation, regime complexes, organisational ecology, polycentrism and the new bricolage, to name just a few key concepts from this intellectual tradition, illustrate that global governance is a useful overarching frame for studying the inherent complexities of current attempts to change unsustainable development path at a planetary scale. On this account, global governance should not be equated with any purposeful programme of 'managing' global affairs, but rather serve as a reminder that a certain amount of non-coordination, overlap and duplication is a generic trait of human organisation.

Directions for Future Research in Global Environmental Governance. Against this background of key findings, we conclude our argument with outlining three areas for future research. First, we argue that while the study of global environmental governance has been an empirical endeavour all along, a renewed focus on empirical questions (beyond the necessary groundwork of conceptualisation and typologies) is required. While questions about what constitutes public versus private forms of governance are central to any attempt to theorise world politics, we believe that theorising will benefit from well-designed empirical studies that attempt to engage with the precise scope conditions and necessary/sufficient conditions for effective, legitimate and equitable governance ofthe environment in the Anthropocene. Second, we note that a more self-reflective and constitutive scholarship of the global environment is necessary to critically reflect upon the role that the institutionalised academia plays in maintaining or overcoming the current global sustainability crisis. The current focus (if not hype) on the transnational and market-based form of governance might well indicate not only a preferred way of solving environmental problems but also an intellectual hegemony of neo-liberal theorising about environmental problem-solving. And third, given the nature of our subject (human-nature interactions in the Anthropocene), we argue that it is high time to overcome the intellectual silo approach that is dominating global governance scholarship. While for reasons of empirical knowledge and scientific networks a certain division of labour in terms of research topics is necessary, much can be learned by careful comparison and cross-fertilisation across 'problem domains' (such as Environment, Health, Economy or Security). The environmental field is a good illustration. For example, while technical debates about the 'right' governance instruments to combat climate change are intellectually defendable, successful climate governance will crucially depend on our ability to understand the interactions of politics, economics, ideology and the human condition. In short, our current cross-cutting 'deep' problems require holistic theorising.

In sum, our analysis of current trends and topics in theorising global environmental governance in the Anthropocene has presented not a unified and consolidated but a burgeoning and lively field of study. Whether this interregnum is an anomaly that will give way to a more coherent and unified understanding of global governance (or the rejection of this concept) or global governance stays a field of academic contestation remains to be seen.

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