

Conclusion: Policy Implications of ESG–Agency Research and Reflections on the Road Ahead

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Chapter Highlights

- While the state remains a key actor across stages of the policy process, it does so alongside and in partnership with diverse actors. The role of the state as an agent of earth system governance has become more complex, contingent, and interdependent.
- In some instances, participatory and collaborate processes have contributed to more effective, equitable, and legitimate environmental governance outcomes. However the reality of participation, particularly in contexts of power asymmetry between actors, is far more complicated. Analyses of these processes should be situated within a broader governance perspective, which recasts questions of policy change around questions of power and justice.
- The complexity and normative aspects of agency in earth system governance requires new forms of policy evaluation that account for social impacts (e.g. legitimacy, accountability, and democracy) as well as the ability of governance systems to adapt within changing contexts.
- While Earth System Governance (ESG)–Agency scholars have made exemplary advances in empirical research, we note that many of the core analytical concepts, such as agency, power, authority, and accountability, remain under-theorized. In addition, some types of actors, including women, labor, non-human agents, those who work against earth system governance, and many voices from the Global South, remain largely hidden in ESG–Agency scholarship.
- To address the geographic imbalance in ESG–Agency research, scholars need to develop research projects and collaborations in understudied regions while also recruiting and supporting scholars in those regions to engage with this research agenda.

15.1 Introduction

We began this volume by noting that the advent of the Anthropocene, with humans now driving the earth system transformation, creates unprecedented governance challenges. Decision makers from the global to the local level must find ways to limit human impacts on biochemical and geophysical cycles that sustain life on Earth and advance long-term sustainability goals by changing political, economic, social, and legal systems at multiple scales (Biermann, 2007; Galaz et al., 2012a, 2012b). The analytical problem of Agency recognizes that governing changes in the Earth's system effectively requires the consent and involvement of a broad range of actors.

Collectively, the contributions to *Agency in Earth System Governance* provide a state-of-the-art understanding of how diverse actors engage with environmental decision-making and exercise authority. In many cases, they are steering society towards a more sustainable future and developing their capacity to deliver effective, legitimate, and equitable earth system governance. Drawing on a systematic analysis of 322 journal articles published in the period 2008–2016 within the context of the Earth System Governance (ESG) Project (see Chapter 1 and the Appendix), the chapters offer an accessible synthesis of this broad body of literature and a valuable orientation to some of the field's major questions and debates. The chapters went further and examined the relation between these bodies of literature and the wider literatures that relate to earth system governance across the social and natural sciences and the humanities.

Overall, we find a richness and diversity of ESG–Agency research covering a wide range and issues across geographic settings (Chapter 4) and levels of governance (Chapter 9) from varying theoretical perspectives and methodological approaches (Chapter 3). This work highlights the power and influence of diverse agents (Chapters 2, 5, and 14) in advancing sustainability goals in the face of unprecedented earth system transformation.

In this final chapter, we outline how ESG–Agency scholarship can inform decision-making across the policy process. We highlight the complex, fragmented, and multiscalar nature of environmental governance systems as well as the challenges of developing participatory processes that truly empower stakeholders and account for diverse interests. We then reflect on what we have learned about ourselves as a research community. While ESG–Agency scholars have made exemplary advances in empirical research, we note that many of the core analytical concepts, such as agency, power, authority, and accountability, remain under-theorized. In addition, some types of actors, including women, labor, non-human agents, those who work against earth system governance, and many voices from the Global South, remain largely hidden in ESG–Agency scholarship. We conclude by

suggesting next steps for future research and connecting our findings from the past decade of ESG–Agency research to the ESG Project’s new Science Plan (Earth System Governance Project, 2018a).

15.2 What Are the Policy Implications of ESG–Agency Scholarship?

The findings of this volume have a wide range of implications for policy, as highlighted by many of the case studies in our dataset, and specifically related to the implementation of the Sustainable Development Goals, climate and ocean governance, biodiversity governance, and governance of cities, among others. These implications span all aspects of policy processes, including agenda-setting, design, implementation, diffusion, entrepreneurship, coalitional dynamics, evaluation, and interplay with broader governance systems and society. Further, the findings also have implications for normative aspects of policy, particularly in light of rapid global change and unfolding earth system transformations.

Collectively, a key message arising from the chapters of this volume is the sheer complexity and plethora of agency-related aspects within earth system governance, which spans both state and nonstate actors across all scales from local to global. In Chapter 2, Michelle Scobie, Tabitha Benney, Calum Brown, and Oscar Widerberg document the diversity of actors that have been studied by ESG scholars over the past decade, including states, intergovernmental organizations, subnational governments, nongovernmental and civil society organizations, and businesses. Subsequent chapters elaborate on the diverse ways in which these agents engage with earth system governance from scientists and academics shaping the coproduction of knowledge (Chapter 7) and the development of global norms (Chapter 10) to resource-dependent communities trying to balance conservation goals with livelihood opportunities (Chapter 11). In Chapter 14, Sander Chan and Ron Mitchell observe that ‘influence flows from networks and relations as much as from single actors’ (p. 170) and emphasize the importance of understanding synergies between actors working collectively and across scales (see also Chapter 9).

ESG–Agency scholarship over the past decade reveals that the role of the state has become much more complex, contingent, and interdependent. For example, Michele Betsill and Manjana Milkoreit (Chapter 6) find that while the state remains essential in performing many governance functions, it increasingly does so alongside and in partnership with other types of actors (Bäckstrand, 2008; Castán Broto and Bulkeley, 2013; Merme et al., 2014; Papa and Gleason, 2012). These findings have implications for the entire policy process. For instance, while the role of state in policy development and implementation does not disappear, it becomes difficult due to the need to deal with numerous diverse interests, claims, and sites of

authority (Bell and Hindmoor, 2009). Betsill and Milkoreit identify a wide variety of governance functions where agency of the state is central and that cut across all aspects of policy development and implementation (Weible and Sabatier, 2017). For example, the ‘convening and facilitating participation’ function relates to policy design and implementation, as does the ‘knowledge generation, provision and sharing’ function relate to policy diffusion and evaluation (see also Chapter 8). However, we call for greater attention to the comparative geographies of policy processes, as all the aforementioned aspects of policy processes will be conditioned by political systems, sociopolitical cultures, and administrative practices and traditions, which vary across contexts (Chapter 4). Considering internal and external political dynamics shaping policy processes, and effects of policy processes on broader governance systems and on socioeconomic and political contexts are worthy of further research by earth system governance researchers.

Given this complexity, a key question arises concerning the ‘character’ of policy development and implementation needed to advance earth system governance. Participatory and collaborative forms of policymaking are often touted as a way of reconciling diverse and competing interests, whereby different actors (such as citizens, businesses, agencies, nongovernmental organizations [NGOs]) are able to interact and identify mutually acceptable solutions (e.g. Ansell and Gash, 2008). ESG–Agency scholarship over the past decade reveals the rapid rise of participatory and collaborative forms of governance and highlights instances in which such processes have contributed to more effective, equitable, and legitimate outcomes. For example, knowledge coproduction processes can help different actors build capacity to participate in and shape governance processes (Bowen et al., 2015; Lebel et al., 2015; Chapter 7). Such processes provide openings for incorporating new forms of knowledge (e.g. indigenous or local) and knowledge-based authority (Gerhardinger et al., 2009; Chapters 7 and 11). In some instances, multilevel governance processes can enhance the ability of actors to exercise agency in earth system governance by increasing the participatory capacity and the implementation ability of nonstate local agents and private actors (Burch et al., 2013; Fujisaki et al., 2016; Mauerhofer et al., 2015; Chapter 9).

However, a recurring theme across the chapters in this volume is that the reality of participation, particularly in contexts of power asymmetry between actors, is far more complicated (Cooke and Kuthari, 2007). Certain actors may exert agency to maneuver or manipulate policy processes to their own ends (Brisbois and de Loë, 2015; Karlsson-Vinkhuyzen and McGee, 2013). For example, Chapter 5 (Agency and Power) discusses the extensive ways in which power and agency interact in earth system governance research (see also Ansell and Gash, 2008). In Chapter 7, Manjana Milkoreit, Jennifer Bansard, and Sandra van der Hel note that exercising agency based on indigenous or local knowledge requires that other agents provide

a platform and/or recognize the value of such knowledge in governance processes (see also Chapter 2). When analyzing agency through the lens of scale, Michelle Scobie, Michele Betsill, and Hyeyoon Park (Chapter 9) observe that expanded scope of actors in multilevel governance structures can disadvantage local communities in efforts to protect their interests (Mathur et al., 2014; Taylor and Cheng, 2012). In addition, shifting governance from the national level to the local level allows for effective public participation and local policy implementation only when local actors have sufficient capacity and resources (Liu et al., 2013; Mulyani and Jepson, 2015; Qi and Zhang 2014; Thaler and Leuin-Keitel, 2016; Young et al., 2012; Chapters 9 and 13). In their review of ESG–Agency literature on accountability (Chapter 13), Calum Brown and Michelle Scobie found that more often than not, involving stakeholders in governance processes failed to make them more democratic or legitimate (Gulbrandsen and Auld, 2016; Kramarz and Momani, 2013; Papadopoulos, 2014).

Yet, how are diverse interests to be addressed in earth system governance, if not through greater attention to participation? An alternative approach is to view policy development and implementation as a political activity, thereby casting question of agency through a prism of political decision-making; for example, which actors are involved in policy processes, in what ways, and with what consequences? While a variety of models of policy change exist (e.g. Weible and Sabatier, 2017), the value proposition for earth system governance is to situate these processes within a broader governance perspective, which recasts questions of policy change in fundamentally new ways, perhaps around questions of power or justice, and other concepts relevant to earth system governance research.

Considering the effects of policy processes brings normative questions to the fore, as both environmental and social evaluation criteria are often likely to be important. For example, Calum Brown and Michelle Scobie argue in Chapter 13 that policy evaluation should include not only the extent to which specific sustainability problems are solved, but also broader social performance concerning legitimacy, accountability, and democracy (see also Chapter 14). Furthermore, James Patterson implies in Chapter 12 that policy evaluation also needs to include the ability of governance systems to adapt within changing contexts (e.g. flexibility, anticipation, and reflexivity). Moreover, ESG–Agency scholarship also indicates a need to evaluate against equity and justice outcomes (Chapters 5 and 11). It is unlikely that single policies will address all these aspects, which means that policy evaluation also needs to look at these aspects within policy systems involving multiple policies and their combined effects. This highlights the need to develop new methods that account for the complex and contingent effects of agency in earth system governance (Chapters 3 and 14).

Lastly, what are implications for individual policymakers and policy implementors, particularly in the context of rapid global change, which spurs the need for urgent action (e.g. IPCC, 2018; Mace et al., 2018; Nerini et al., 2018; Tortajada and Biswas, 2018)? A first implication is the politically laden nature of policy development and implementation work, which probably comes as no surprise to practitioners involved in such activities, but is important because it indicates potential for influence across potentially all aspects of policymaking and implementation. For example, ‘institutional work’ involving both strategic and day-to-day activities may have effects that cumulate into much larger changes within governance systems (Chapters 6 and 8) (Beunen and Patterson, 2016). How organizations and policy actors learn about the nature of ESG challenges and collectively develop solutions to these challenges will play an important role in policy implementation (Heikkila and Gerlak, 2013, 2019).

A second implication is the importance for those involved in policy development to think aspirationally beyond specific policy problems to align policy with larger earth system governance challenges (Chapter 12). At the same time, it may be useful for policy evaluation to critically examine how policy activities contribute to addressing these larger problems, even if indirectly (e.g. policy experimentation opening up new actor configurations or imaginations, catalytic effects across policy and problem domains, ‘diffusion of inspiration’ across contexts) (Bernstein and Hoffmann, 2018; see also Chapters 7 and 14). A final, broader, implication concerns the enduring value of the state as a critical source of ideas, action, and authority for addressing societal problems (Chapter 2). From a policy perspective, the state arguably retains potential as an authoritative anchor for collective action, even though earth system governance is more and more dispersed. Despite being heavily critiqued over the last decade or more, the role of the state is experiencing somewhat of rapprochement in recent years in some lines of thinking, such as arguments about the need for ‘mission-oriented innovation policy’ to support collective action in addressing major societal challenges (Mazzucato, 2017). This opens up new avenues for agency in policy development for shaping societal transformations towards sustainability.

15.3 What Have We Learned about Ourselves as a Community?

Through the ESG–Agency Harvesting Initiative, we have learned that ESG scholars have broadened and deepened our understanding of agents and agency in earth system governance through innovative empirical research. We have documented the diversity of actors engaged with issues such as climate change, deforestation, freshwater conservation, energy governance, and biodiversity protection and highlighted the rise of participatory processes and stakeholder engagement as

a platform for the exercise of agency. We have come to understand that agents perform many different functions that can shape multiple aspects of governance architectures and policy processes. At the same time, we have come to have a more nuanced understanding of agents and agency, recognizing that their operation and effects are often contingent and context dependent. This demands greater attention to interactions and networking between agents, power relations, and multilevel and multiscale dynamics.

That said, it is important to reflect on some notable gaps that came to light in the course of our review. First, we find that several different types of actors and perspectives are underrepresented (if not entirely absent) in ESG–Agency scholarship between 2008 and 2016. For example, Gabriëlsson and Ramasar’s (2013) study of widows in the context of food and water security in Kenya was one of the only articles in the ESG–Agency Harvesting Database with an explicit focus on women and a gendered perspective. Other identity-based groups (e.g. racial and ethnic minorities; children) were virtually absent in this body of scholarship. While business has received considerable attention as an agent of earth system governance, other types of actors within the political economy of earth system governance have been overlooked. This includes workers who can be understood both as an organized interest with a vested stake in earth system governance as well as individuals who may be affected by the environmental impacts of economic activities and/or shifts to a low-carbon economy.

In addition, investments from private philanthropies increasingly underlie many of the world’s sustainability efforts from the global to the local level. Their flexibility and willingness to take risks may be essential in speeding up a transition to a sustainable future, but their role in earth system governance raises challenging questions about democracy, justice, and power dynamics. Within the context of the Anthropocene, it becomes more essential to incorporate non-human agents including nature, technology, and planetary systems into our analyses of Agency. Most importantly, given the rise of populism and rapidly changing political dynamics around the world, it is essential to pay greater attention to agents and agency that operate against earth system governance. We found very few critiques of these groups within the literature. Finally, we find an underrepresentation of agents based in and perspectives from the Global South.

Second, we observe that some of the core concepts of earth system governance remain under-theorized. For instance, while a large number of scholars aim to understand various agents and agency in earth system governance, often agency is assumed rather than explained (Chapter 2). While assuming agency is a practical stance that has not prevented excellent agency-centered (often case-based) research; earth system scholarship should not eschew the theoretical work to understand how actors become agents or how their authority is exercised and

restricted. In this sense, a decade of ESG research has not diminished the relevance of (preceding) calls for greater theoretical reflection about the nature of agency and authority (Eisenstad, 1989; Kelly and Adger, 2000; Shove, 2010). The lack of theoretical reflection, while not preventing the build-up of (case-based) knowledge of manifestations of agency, could perpetuate and amplify methodological and geographic biases, and prevent a better understanding of principles that underlie different forms of agency.

Similarly, power is under-theorized. For instance, power is frequently used as an explanatory variable in describing environmental governance dynamics and outcomes without specifically developing what is meant by the term. Power is often linked to normative issues such as justice, equity, and inclusion that are associated with the quality of governance processes and outcomes (e.g. Jodoin et al., 2015; Robinson and Makupa, 2015). However, the failure to clearly define what power is and how it operates weakens the persuasiveness of these normative arguments and makes them difficult to measure or count in policy terms. This gap may be related to the low prevalence of critical theoretical perspectives in ESG–Agency research (Chapter 3).

Where power is examined in ESG–Agency research, it tends to be conceptualized as either power ‘to’ (e.g. the ability of the less powerful to influence outcomes), or power ‘over’ (e.g. structural constraints that make it impossible for marginalized actors to fully realize their interests) (Chapter 5). This results in analyses with a tendency to produce either overly optimistic or pessimistic assessments of the ability of actors to exercise agency in earth system governance processes. However, an increasing number of works do move beyond this dichotomy (e.g. Clapp and Fuchs, 2009; Newell, 2012). Further, there are a number of rich conceptualizations of power in ESG contexts (e.g. Bernstein, 2011; Brisbois and de Loë, 2016; Bulkeley, 2012; Zeitoun et al., 2011). Nevertheless, these insights have not been widely integrated or developed in ESG–Agency scholarship. Rather, the ESG community appears reluctant to interrogate the socioeconomic and market structures that shape the power to determine governance outcomes, even where those structures are noted as problematic. There is considerable room for further conceptual development that builds upon existing work and critically examines the sources and modes of power that shape governance, even when this produces scholarship that is political in nature.

Further, we observe division within the ESG community around questions of power and authority. Although there seems to be a consensus in the ESG–Agency literature that globalization has increased the power of nonstate actors such as scientific experts, NGOs, and firms, there is a disagreement on whether their power goes along with authority. For Max Weber, power can be defined as the mere ‘probability that one actor within a social relationship will be in a position to carry

out his own will,' whereas authority 'is the probability that a command with a given content will be obeyed by a given group of persons' (Max Weber, quoted in Coleman, 1997, p. 31). As authority rests on the consensual acceptance of super- and subordination, it is empirically perceived as legitimate (Steffek, 2004). The exercise of authority is usually associated with democratic decision-making procedures (Bernstein, 2011, pp. 21–2). Power, in contrast, describes a 'merely factual relation' which may or not be perceived as legitimate (Coleman, 1997, p. 32).

Despite the many possible concepts of power, in earth system governance scholarship, many authors assume that environmental governance can be justified by its outputs, (i.e. its contributions to the conservation of nature and the prevention of climate change [Breitmeier et al., 2011]). However, they also assume that the lack of democratic controls must be counterbalanced by stricter standards for accountability, responsiveness, and transparency (Bernstein, 2011; Jodoin et al., 2015). Other authors, however, argue that the power of transnational actors is ultimately rooted in the highly unequal structures of the global political economy (Bulkeley and Schroeder, 2012; Spagnuolo, 2011). These two camps in the ESG literature tend to speak past each other. Against this background, we think that scholars should devote more attention to the question of whether and how shifting power constellations can be reconciled with authority in order to increase the legitimacy of global environmental politics.

Finally, we can reflect on how ESG–Agency scholarship has engaged with and contributed to the broader environmental governance literature as well as agent–structure debates in the social sciences. As noted in Chapter 1, the ESG Project represents a unique approach to the study of environmental governance. This volume highlights how ESG–Agency research intersects with several of the key themes in the environmental governance literature, including scale (Chapter 9), adaptiveness (Chapter 12), learning and knowledge (Chapter 7), accountability (Chapter 13), and equity and justice (Chapter 11). Despite hopes that the ESG Project's planetary perspective would foreground challenges such as the global food crisis and climate migration, we find that ESG–Agency research has focused on fairly 'traditional' issues such as climate change, forests, and freshwater (Chapter 4). We do see that ESG–Agency researchers have embraced the ESG Project's normative commitment to sustainable development, which appears to have shaped the research agenda by emphasizing the creation of new institutions and enabling the role of architecture in agency (Chapter 8) and focusing largely on the most visible actors working towards a sustainable future (Chapter 2).

Throughout this volume, contributors find that the ability of actors to become agents as well as how agents interact with governance process is shaped by the structural context in which they operate. For example, forms of governance (hierarchical, market-based or networked) and multilevel/multiscalar dynamics

can enable or constrain the ability of agents to perform governance functions (Chapters 6 and 9). In Chapter 8, James Patterson focuses on this interplay, noting that agency shapes structure (Architecture) through the creation, maintenance and disruption of institutions. He concludes that structure often enables agency by providing new sites of contestation while acknowledging that structures may also constrain agency through limitations on authority as in the case of the High-Level Political Forum (Abbott and Bernstein, 2015) or weak institutional capacity to support stakeholder processes (Dunlop and Corbera, 2016). Finally, Mike Angstadt and Ina Möller's discussion of the link between agency and norms (Chapter 10) identifies one strand of research that defines norms as part of the structural environment with a focus on both the constraining and catalytic effects on agency (e.g. Coolsaet and Pitseys, 2015; Naess et al., 2015).

15.4 Where Should We Head with ESG–Agency Scholarship?

By discussing agency across the breadth of earth system governance scholarship, this volume can be useful for individual scholars to position themselves, build on, and critically reflect on relevant work. This involves reflecting on possible biases in agency research on earth system governance. For instance, we observe that scholars have a strong normative commitment to sustainable development, assuming governance functions such as norms and standard-setting, providing a knowledge base and building capacity to help society advance sustainability (see Chapter 7). Such commitment, while laudable, has led to a relative neglect of agency *against* earth system governance. We see, however, opportunities to make the systematic uncovering of possible biases a recurring endeavor in agency-centered research, applying approaches that sift through a large body of predominantly case-study research (see Chapter 8). Although there may be fewer incentives for meta-studies of existing case studies, adopting a meta-study approaches can help uncover biases and inconsistencies in a more systemic manner and also place individual contribution in the context of rich and ongoing discussions.

Although our examination of methodological approaches showed a clear preference for qualitative and multimethod qualitative research, we also observed a slowly growing methodological pluralism. Pluralism in research can occur across research methods and the number of methods used, the qualitative and quantitative divide, and from a single case to many cases (Campbell et al., 2015). Inherent in the practice of methodological pluralism is the belief that all research methods add value, none are superior to the others, and that varied perspectives all add information about the phenomena at hand. Some emerging research reports that diversity in a range of fields produced positive outcomes. Studies have shown that diverse teams tend to perform better than similar teams (Ellison and Wallace, 2014). Others

find that inclusive teams make better business decisions 87% of the time (Sherbin, 2017).

In earth system governance research, exploring important topics from various perspectives can help to triangulate or confirm findings; illustrate new thresholds, mechanisms, or variables; and improve overall confidence in the research findings. Owing to the sheer size, importance, and complexity in ESG–Agency research, it seems imperative that a range of perspectives should be encouraged to address urgent environmental and social change. Methodological pluralism is an important strategy for producing researchers who can work in inter- and multidisciplinary settings and share information, thus increasing the speed of innovation and impact.

The 2018 ESG Science Plan (Earth System Governance Project, 2018a, p. 69) reaffirms that methodological diversity is expected to produce a better, more durable outcome or resolution when multiple perspectives are considered. However, securing the gains from methodological pluralism requires more than just awareness. As with all types of imbalances, efforts must be made to assure methodological rigor from a broader range of methodical approaches. Innovative methods and theoretical frames must remain a priority if ESG–Agency research is to advance and make important contributions to earth system governance. This can be accomplished through training; dedicated panels; and sections focused on advanced methods, mixed methods, and innovative synthetic methods. The widening of the ESG network, in this regard, could prove an opportunity to engage scholarship that works with underrepresented methodologies such as three-dimensional computer modeling or other complex methods.

Growing awareness of, and reflection on, agency could help individual researchers situate their contributions in the broad field of environmental governance. However, by themselves, they will run into difficulties in realizing interdisciplinarity and transdisciplinarity, which the 2009 ESG Science Plan and many scholars since, have since pointed out as crucial in advancing earth system governance. The scholarly community around earth system governance thus face a triple challenge: (1) to continue and to deepen disciplinary research; (2) to link across disciplines; and (3) to build transdisciplinarity. The role of scholarly networks in general, and the ESG Project specifically, have an important role to play, both through dyadic linkages between scholars with different backgrounds within these networks, as well as through facilitating linkages across different sites of knowledge in both theoretically and in applied settings.

Deeper disciplinarity may seem the stronger fit within ESG scholarship, considering the continuing orientation toward case studies. Nonetheless, many disciplines of social sciences are increasingly concerned with questions of causality, and the regularities of social life (see Mounk, 2016). Within political science, for instance, the number of scholars interested in explaining particular (irregular)

events through descriptions and interpretations has been dwindling, while the number of scholars, academic programmes and journals focused on understanding the world through largely comparative and quantitative research is increasing. Recent methods, however, may open up different pathways for deeper disciplinaryity. For instance, Bruno Latour's Actor–Network Theory (ANT) could inform contemporary ethnographies of social practices in earth system governance. Process tracing could help earth system governance scholarship uncover causal mechanisms in the real world and compose rich and in-depth case studies (e.g. Beach, 2018). We could also apply these methods to ourselves as communities of earth system governance scholars, to explore our (academic) agency – and to detect possibly self-reinforcing feedbacks that perpetuate the types of research we do and the biases that we tend to replicate.

Interdisciplinarity could be thought of as the acknowledgment of relevance of agency across different scientific disciplines: the idea that cocreated outputs of research are often superior to disciplinary orthodoxy. A decade of implementation of the 2009 ESG Science Plan was marked by social and economic upheaval that was often met by incomprehension with the very disciplines that were seen as best-equipped to understand these changes. For instance, the 2008 financial crisis was not anticipated by most economists who often used mathematical models that failed to capture the agency of financial institutions (Colander et al., 2009). Similarly, the rise of populism and the shock election of President Donald Trump, or the UK vote to leave the European Union, was not anticipated by the majority of political scientists. Through a combination of deeper disciplinaryity and interdisciplinary collaboration, the complex world marked by nonlinear systemic linkages may be better grasped. Not only does a broader representation of people with different skills and knowledge backgrounds bring different theoretical perspectives into the understanding of contemporary events and developments, but there is also real scope for furthering earth system governance as a whole through cocreating research and research agendas between scholars of different disciplines.

Fortunately, interdisciplinary research has increased substantially over the past decade (see Chapter 3), which has been expressed in a rich variety of theoretical approaches, and methodological pluralism. However, interdisciplinary collaborations are unevenly distributed in the ESG–Agency community. While significant collaboration is found between a few social sciences (e.g. political science and economics), some disciplines are rare in collaborations, including humanities and law. Interdisciplinary collaboration between natural and social scientists is even rarer, as discussed in Chapter 14. Moreover, despite significant system-based theory building, methods have barely kept up with the scrutiny of the complexity of earth systems. In this regard, the envisaged collaboration between social and natural sciences in the 2009 ESG Science Plan (Biermann et al., 2009) remains

rare. In other words, there is still a lack of studies that apply integrates ESG–Agency research and complex models or mixed methodologies (see Chapter 3). This should not be reason to rush into applying (new) sets of methodologies, but to contemplate the complexity and multifaceted questions we ask in earth system governance. Instead, we aim to consider the strength and limitations of existing methods, and to build new partnerships across disciplines and with researchers that can enrich a systems perspective of social, ecological, and economic change.

Similarly, reflexivity and disciplinary humility are key to *transdisciplinarity*, which could be thought of as the acknowledgement of different types of knowing within and beyond academia, and the appreciation of the perspective of others, especially the under-represented. Transdisciplinarity can enrich knowledge creation and help avoid theoretical myopia. For instance, by engaging stakeholders in the practice of sustainability governance not only as research subjects, but also as knowledge cocreators, scholars can reconsider or reexamine the questions they seek to answer or the data they seek to obtain. Such transdisciplinarity will allow the weaving in of views of interconnectedness into research designs, between the social and the natural, and between knowledge communities, as well as include a significant degree of reflexivity and awareness of positionality. Researchers should not be limited in their investigation of fundamental and theoretical questions, being largely publicly funded, they also need social legitimacy.

To stimulate transdisciplinarity, it will be necessary for scholars of earth system governance to consider positionality and reflexivity. Transdisciplinary processes will require the consideration of positionality of earth system governance research itself, researchers will need to clarify *their* values and positions (Armitage et al., 2012; Milkoreit et al., 2015). Chapters 6 and 8 emphasized such need to understand agency and architecture interplay in the Anthropocene; the same, however, also applies to the architecture and agency of the scholarly community of earth system governance and academia in general. Reflexivity will require a focus beyond mere performance, but also an investigation in the scope conditions and contexts that inform the questions we ask, the credibility of our position as researchers and whether and to which extent research should respond to, and interact with social and environmental change (see Chapter 8).

Credible communication of science-based recommendations is one area where earth system governance scholars need to continue to engage. Indeed, on the ‘output side’ of academia, clear communication and translation of relevant findings to and with audiences beyond specific disciplines require much work. Much is changing in this regard, scholars often facilitate interconnections between research and science and policymaking; research funders and journals are encouraging to highlight policy relevant findings, and panels with nonacademic experts are no exception anymore at scientific conferences. Scholars have played, and continue to

play, an important part in communicating the urgency of global environmental change as they have most recently in the IPCC Special Report on 1.5 C and the March 2019 Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on the state of global biodiversity.

For many scholars of earth system governance, the urgency emanating from research spills into other spheres of life. A normative commitment to sustainable development compels them not only to communicate urgency to communities beyond their discipline, but also to critically observe their own role in affecting change. From the unease of frequent academic traveling, to low-carbon diets at research meetings and building green universities, scholars in earth system governance increasingly question their own role beyond the confines of their research work. In this regard, the main concern about a lack of interdisciplinary and multi-disciplinary work is that these are crucial to understand and improve the practice of earth system governance and realizing sustainable development (Chapter 14).

A specific shortcoming, in terms of the positionality of ESG–Agency research, is that the majority of research is conducted in the Global North, and researchers with developing country backgrounds remain underrepresented. Engagement of South-based partners and stakeholders in knowledge creation at an early stage in research design is commendable, but there may be a need to understand why such geographic imbalances might be there in the first place. Is it a question of limited capacities; or are research and problem statements primarily shaped by and funded by North-based perceptions and interests? In this regard, we note that linguistic differences may structure ESG–Agency research. While ‘agency’ might conjure a more or less common understanding among English-speaking researchers, the very notion may not translate or carry the same connotation outside the English-speaking world. For instance, contributors to this volume of very diverse background noted that the word ‘agency’ does not seem to have a precise equivalent in German, Dutch, Korean, or Chinese. Such linguistic differences may constitute a challenge in international research on agency. However, cross-cultural collaboration may also enrich and broaden the scope of research on agency by reflecting on the many proximate understandings of agency that may bring in new perspectives, and help uncover possible biases relating to an increasing English-dominated academia.

Early engagement of scholars from emerging and developing countries in the design and proposal phase may also bring in much needed perspectives and problem framings beyond the Global North. In this regard, the ESG project, despite shortcomings, can actually serve as an example. Particularly, the project has aimed at geographically distributed advisory and implementation roles, in particular through ESG lead faculty and the Global Alliance of Earth System Governance Centres. A strategic focus on redressing geographic imbalances across all phases of

research, from fundraising and proposal writing, to the implementation of research and communication of findings, through globally distributed networks could help facilitate researchers to connect and to codesign.

Finally, the urgency of global environmental and social change compels the ESG scholarly community to develop communication strategies and networks to advance knowledge of sustainable development across disciplines and with practitioners and policy makers. We see a translation and dialogue challenge, particularly to communicate current research to different languages and to different audiences thereby, reducing the transaction costs of transdisciplinary cooperation. We challenge the ESG community to face and tackle this challenge head on.