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Global Climate Governance beyond 2012: an Introduction

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Published in:

Global Climate Governance Beyond 2012. Architecture, Agency and Adaptation

2010

Document Version:

Peer reviewed version (aka post-print)

[Link to publication](#)

Citation for published version (APA):

Biermann, F., Pattberg, P., & Zelli, F. (2010). Global Climate Governance beyond 2012: an Introduction. In *Global Climate Governance Beyond 2012. Architecture, Agency and Adaptation* (pp. 1-12). Cambridge University Press.

Total number of authors:

3

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Global climate governance beyond 2012: an introduction

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Future historians might remember the period 2009–2012 as a turning point in the political response to global warming and climate change. The 1980s were a time of agenda-setting in which climate change became accepted as a political problem; the 1990s saw the first institutionalization through adoption of the United Nations Framework Convention on Climate Change in 1992 and its Kyoto Protocol in 1997. The 2000s marked the period of ratification of the protocol and further institutionalization of its means of implementation. Yet the Kyoto Protocol was merely a first step, and its core commitments expire in 2012. Even full compliance with the Kyoto agreement will not prevent ‘dangerous anthropogenic interference with the climate system’ – the overall objective of the climate convention. Concentrations of greenhouse gases in the atmosphere are rising, while drastic reductions of emissions are needed according to current scientific consensus (IPCC 2007).

These years are thus a crucial moment for human societies to change current economic, social and political development paths and to embark on a transition to new ways of production and consumption that emit less carbon – or to adapt to a world that is substantially warmer and hence different from the world that human and natural systems have been adapted to so far. At the planetary level, this is the quest for long-term, stable and effective ‘global governance’. The term governance derives from the Greek work for navigating, and this challenge of turning around the wheel and charting a new course is indeed what is at stake in current negotiations on climate change.

Yet what is this new course that societies should navigate? What is the direction to follow? What systems of governance will promise to deliver the steering mechanisms needed to achieve drastic cuts in greenhouse gas emissions? These are the main questions and motivations underlying this book, which seeks to chart new directions for global climate governance beyond 2012, when the commitments of the Kyoto Protocol expire and new agreements are needed.

Within the large array of important issues that need to be addressed in shaping global climate governance beyond 2012,¹ the contributions in this book focus on three issues that are, we believe, pivotal for any new governance structure.

First, we look into different options for the overarching architecture of global climate governance beyond 2012. While the term governance ‘architecture’ is found in policy debates in a variety of meanings, we use it here for a specific empirical phenomenon: the overall system of often overlapping, not always coordinated and at times conflicting institutions, norms and decision-making procedures in the area of climate governance (see Biermann *et al.*, this volume, Chapter 2). We are interested in particular in assessing whether higher or lower degrees of fragmentation of this overall architecture promise to be more effective in steering societies towards lower emission levels of greenhouse gases. We also look into whether more centralized governance – organized around and steered by a central treaty, for example a new comprehensive protocol to the climate convention – will increase overall effectiveness, or whether pluricentric, diverse and possibly redundant systems of governance would bring better outcomes. This question, which is at the centre of the first part of this book, has major policy implications, since governments are constantly confronted with different demands and must define strategies that may point towards centralization and integration, or rather towards fragmentation, diversity and pluricentric governance.

Second, this book looks into the role of a particular type of actors, and of a particular type of institutions, that have taken a more visible and possibly more relevant place in global climate governance in recent years: non-state actors and, more generally, governance beyond the state (see the conceptualization by Pattberg and Stripple, this volume, Chapter 9). These agents include a vast array of purely private actors, such as environmentalist groups, business associations or scientific networks. They also include public actors beyond central governments, for example cities, provinces or intergovernmental bureaucracies. Importantly, the question of agency beyond the state embraces new types of institutions and networks that assume governance functions with no or only marginal involvement of central governments, for instance the many ‘partnerships for sustainable development’ that have been agreed around the 2002 World Summit on Sustainable Development. Last but not least, governance beyond the state is governance beyond traditional means of public policy and intergovernmental rule-making. Especially in climate governance, market-based approaches have become prominent elements of many programmes and strategic proposals, from the hybrid Clean Development Mechanism that combines public and private steering to regional emissions trading

¹ For overviews of the many proposals on future global climate governance see Baumert *et al.* 2002; Bodansky *et al.* 2004; Aldy and Stavins 2007; Kuik *et al.* 2008.

and the many voluntary schemes for ‘offsetting’ emissions. How can we better understand the role and relevance of this increasing trend towards privatized and market-based governance mechanisms for climate change mitigation and the host of private actors that surrounds these new mechanisms? To what extent, and under what conditions, do private or public–private transnational governance mechanisms produce policy outcomes that are comparable, or even superior, to (traditional) forms of intergovernmental cooperation? To what extent should policies beyond 2012 include, or rely on, private and market-based governance? These questions are analysed in more depth in the second part of this book.

The third part of this volume studies global adaptation governance, building on the assumption that despite all mitigation efforts, some degree of global warming cannot be prevented. Adaptation to climate variation has always been a factor in human development, and adaptation to global warming is today part of discourses and decisions in many nations, in both North and South (see for example Jordan *et al.* 2010 on European policies in this field). Yet what is still uncertain is the global response to the myriad local problems of adaptation. The expected climate changes are likely to affect many core areas of global society, from the world economic system to global health, food security, trade, the provision of water, energy and other basic services, up to major humanitarian crises through climate-related migration or violent conflicts (see the conceptualization by Biermann and Boas, this volume, Chapter 14). Global adaptation governance must thus be part of climate governance beyond 2012. For many countries, notably the low-lying or semi-arid developing countries, global governance in support of local adaptation may evolve as one of the most crucial issues in this century. But what are promising policy options for the adaptation of regions, countries and international institutions to the impacts of climate change? To what extent do effective adaptation policies require global regulatory mechanisms, as opposed to local policy-making? To what extent does effective adaptation governance require the integration of adaptation policies in the overall climate governance architecture, and/or in other policy domains? These questions are the focus of the third part of this book.

These three core research themes – the *architecture* of global climate governance; *agency* in climate governance that goes beyond the central nation state; and *adaptation* to climate change at the level of global institutions and organizations – are not mutually exclusive. For instance, questions of architecture are also relevant when developing institutions for future adaptation governance, and non-state actors are important for adaptation as well. Instead of providing a clear-cut taxonomy, the three themes rather provide diverse lenses to approach the complexity of global climate governance and to direct attention to key issues and trends.

The selection of the three themes has been informed by current political processes, but also by broader debates in international relations and international law,

for example on globalization, transnationalization, fragmentation and legitimacy (Ruggie 2001; Rosenau 2003; Hafner 2004; Börzel and Risse 2005). Linking research on climate governance to these broader theoretical and conceptual discourses in the social sciences (such as the role and relevance of the state versus non-state actors) increases understanding of contemporary climate governance while also contributing to theory consolidation within and across disciplines.

In addition, this book is part of two larger research programmes. First, our research is an integral contribution to the European research programme 'Adaptation and Mitigation Strategies: Supporting European Climate Policy' (the 'ADAM Project'), funded by a major grant from the European Commission. The ADAM Project is characterized by a high degree of interdisciplinarity that brought together more than 100 experts in disciplines as diverse as economics, engineering, political science or climate modelling. The project is also innovative in its focus on combining research on mitigation and adaptation in one integrated research design. The research in this volume presents the core results of one work package within this larger project, concentrating on 'Post-2012 Options in Global Climate Governance' (see Hulme and Neufeldt 2010 on the overall results of the ADAM Project; as well as Jordan *et al.* 2010 on European climate governance and Gupta and van der Grijp, 2010 on the relationship between climate governance and development cooperation).

Second, this volume is one of the first publications that respond to the science and implementation plan of the Earth System Governance Project, a new long-term research programme on governance and institutions under the auspices of the International Human Dimensions Programme on Global Environmental Change, which will last from 2009 to 2018 (Biermann *et al.* 2009). This science and implementation plan of the Earth System Governance Project identifies five core analytical problems, three of which are studied in this volume: different architectures of global and local governance, the role and relevance of different types of agents and agency in earth system governance, and the adaptiveness of governance systems.

As part of both the ADAM Project and the Earth System Governance Project, this book draws on the systematic and comprehensive integration of different disciplinary bodies of knowledge and of different methodological tools and approaches, from international law, political science and global governance studies to place-based development research and computer-based scenarios and modelling exercises. In particular, the three research themes of architectures, agency and global adaptation have been analysed from the perspective of three methodological approaches, each contributing to a comprehensive examination:

First, we analysed each theme by means of policy analysis. These studies advanced understanding of opportunities and barriers for policy-making at different stages of the policy process, as well as of institutional interlinkages and barriers to rule-making. We covered criteria of inclusiveness and legitimacy (regarding the

participation of different types of actors), social acceptability, and political feasibility. These methods helped determine the viability and the legal and political effectiveness of policy strategies, that is, their chances to materialize as concrete legal provisions (for example new rules under a future climate regime) and to change the compliance incentives of actors. Theoretical approaches applied in our research include institutional theory and global governance research, bargaining and game theory, international law analysis and economic analysis.

Second, the use of modelling tools helped to create a structured and quantitative framework for analysis. These methods focus less on political or legal implications but rather on criteria of long-term effectiveness and efficiency of policy options. They assist in determining the structural effects of selected strategies on both the global climate and social systems, for example regarding long-term emission reductions or effects on national incomes. Methods applied in this research include the FAIR meta-model, developed by the Netherlands Environmental Assessment Agency (Hof *et al.*, this volume, Chapter 4). FAIR is a stylized multi-region formal model that integrates modelling of the climate system (the relation between greenhouse gas emissions, concentrations and temperature) with the social-economic system (costs of mitigation, emissions trading and effects of climate change on national income). A second model employed is REMIND, developed by the Potsdam Institute for Climate Impact Research. REMIND is a hybrid model designed to integrate macroeconomic, energy system and climate modules. It is a multi-region endogenous economic growth model that can focus on regional interactions such as trade flows, foreign investments or technological spill-over.

Third, many contributions to this volume draw on participatory assessment approaches. Such tools give voice to stakeholders' perspectives. They allow for a critical examination of policy recommendations against the interests and concerns of key stakeholders, and can assist in refining recommendations into feasible and socially robust strategies. Participatory assessments hence complement the examination of political feasibility criteria provided by policy analysis. Participatory methods applied here include a series of structured international workshops with experts and policy-makers; regular consultations with an advisory group of senior experts and policy-makers; and a major survey of Southern policy-makers, academics and representatives of non-governmental organizations. The participatory appraisal exercises were held in New Delhi, India, on developing country perspectives; in Geneva, Switzerland, jointly with the Economics and Trade Branch of the UN Environment Programme, on climate and trade policies; in Lund, Sweden, on the reform of the Clean Development Mechanism; in Brussels, Belgium, on adaptation funding; in Brussels, Belgium, jointly with the Centre for European Policy Studies, on the overall research results; and finally a dialogue-event at the thirteenth conference of the parties of the climate convention in Bali.

The research in this volume has been policy-relevant in orientation while remaining academic in nature. Most efforts were directed at scoping or developing policy options that could provide a basis for future climate governance, and at appraising these options through multi-disciplinary assessment methodologies. While many of these policy options are derived from current debates, their appraisal took a much broader, long-term perspective, in a search for solutions that may be relevant and viable long after the current negotiations have ended. Also, while core elements of this research drew on local facts and findings – for example in studies on vulnerabilities of the poorest of the poor – our focus remained at the global level and at the most important elements of an overarching governance architecture for mitigating, and adapting to, global climate change.

This book is structured along the three research themes of architecture (Part I, Chapters 2–8), agency (Part II, Chapters 9–13) and adaptation (Part III, Chapters 14–18) (Table 1.1). We conclude with a summary of our research results and a number of concrete policy recommendations for global climate governance beyond 2012 (Biermann, *et al.*, this volume, Chapter 19).

Part I addresses the problem of governance architecture. In this part, Biermann and colleagues (this volume, Chapter 2) first conceptualize global governance architectures as the overarching system of public and private institutions – that is, organizations, regimes and other forms of principles, norms, regulations and decision-making procedures – that are valid or active in a given issue area of world politics.

Based on this understanding and a comprehensive qualitative policy analysis, Zelli and colleagues (this volume, Chapter 3) appraise the consequences of different degrees of fragmentation for climate governance. They argue that different types of fragmentation are likely to have different degrees of performance. While synergistic fragmentation may bring both costs and benefits, there are hardly any convincing arguments in favour of more conflictive fragmentation.

Hof and colleagues (this volume, Chapter 4) complement this qualitative analysis with a quantitative assessment of different types of global climate architectures. They apply the FAIR meta-model to different governance scenarios and review quantitative studies about the costs and environmental effectiveness of universal and fragmented regimes. With this overview, they close a crucial research gap: in recent years, scholars have devised numerous proposals on universal and fragmented regimes. Yet while many of these proposals have been quantitatively assessed, no attempt has yet been made to compare cost estimates of these studies for specific regions under different architectures.

Flachsland and colleagues (this volume, Chapter 5) similarly provide a quantitative account of different fragmentation scenarios, focusing on emissions trading. Based on the REMIND model, they analyse different integration scenarios for

Table 1.1 *Research themes and methodologies*

	Architecture	Agency beyond the state	Adaptation
Policy analysis	<p>Institutional fragmentation (<i>institutional theory, bargaining theory, international law</i>)</p> <p>UN climate regime and world trade regime (<i>institutional theory, bargaining theory, international law</i>)</p> <p>Equity-based architecture for North–South cooperation (<i>qualitative policy analysis</i>)</p>	<p>Transnational climate governance (<i>institutional theory</i>)</p> <p>CDM reform (<i>institutional theory</i>)</p> <p>Research and development, and technological change (<i>economic analysis</i>)</p>	<p>Climate refugees (<i>institutional theory, international law</i>)</p> <p>Food insecurity (<i>institutional theory</i>)</p> <p>Adaptation funding (<i>qualitative economic analysis</i>)</p> <p>Interests and perspectives of developing countries (<i>institutional theory, international law</i>)</p> <p>Vulnerability of the poorest of the poor (<i>socio-economic analysis</i>)</p>
Modelling	<p>Institutional fragmentation (<i>FAIR meta-model</i>)</p> <p>Linking of emission trading systems (<i>REMIND model</i>)</p>	<p>Sectoral mitigation (<i>FAIR meta-model</i>)</p>	<p>Cost–benefit interlinkages between adaptation and mitigation (<i>FAIR meta-model</i>)</p>
Participatory approaches	<p>Institutional fragmentation (<i>side-events at conferences of the parties, UNEP workshop, policy workshop in Brussels, developing country conference in Delhi, interviews, survey</i>)</p> <p>UN climate regime and world trade regime (<i>UNEP workshop, policy workshop in Brussels, interviews</i>)</p> <p>Southern perspectives (<i>developing country conference in Delhi</i>)</p>	<p>Transnational climate governance (<i>interviews, survey</i>)</p> <p>Reform of Clean Development Mechanism (<i>policy workshop in Lund, policy workshop in Brussels</i>)</p> <p>Market-based mechanisms and developing countries (<i>developing country conference in Delhi, survey</i>)</p>	<p>Climate refugees (<i>side-events at conferences of the parties, policy workshop in Brussels, interviews</i>)</p> <p>Food insecurity (<i>side-events at conferences of the parties, developing country conference in Delhi, policy workshop in Brussels, interviews</i>)</p> <p>Adaptation in developing countries (<i>developing country conference in Delhi</i>)</p> <p>Adaptation funding (<i>policy workshop in Brussels, interviews</i>)</p>

carbon markets – for top–down trading schemes, like the one established by the Kyoto Protocol, but also for linking bottom–up schemes with decentralized decision-making systems that are emerging in the United States, Canada and other countries. In examining these different scenarios, they quantify likely changes in global and regional mitigation costs.

In Chapter 6, Zelli and van Asselt concentrate on a related aspect of the fragmentation of the global climate governance architecture, namely overlaps between the climate convention and the World Trade Organization. Both arenas address similar topics such as emissions trading or the transfer of climate-friendly goods, services and technologies. This duplication of debates and the associated lack of legal clarity may imply detrimental ramifications for the climate regime. For instance, parties to the climate convention that fear incompatibility with WTO rules might refrain from implementing ambitious domestic climate policies. Based on the results of a joint workshop with the United Nations Environment Programme, Zelli and van Asselt explore a range of policy options to tackle such negative implications.

While these chapters focus on particular components of the global climate governance architecture and its fragmentation, Winkler (this volume, Chapter 7) explores options for a future global architecture from the perspective of North–South cooperation and the principles of equity and common but differentiated responsibilities. In his qualitative analysis, he assesses different approaches and concludes that there is not just one option for compromise, but a number of feasible ways to strike a balance between developing and industrialized countries. He therefore suggests conceptualizing options for future climate governance architecture as a continuum of feasible scenarios and negotiation packages. Winkler explores two of these compromises in further detail.

Shrivastava and Goel (this volume, Chapter 8) also review the options for an effective and equitable architecture of global climate governance from a perspective of the developing countries, yet from a different angle that focuses on technological capability and financial support from industrialized countries to developing countries. They see it as critical that the future global governance architecture is guided by national requirements of developing countries. To this end, they suggest as best policy option a two-tier architecture with two distinct but integrated components: a set of institutions, policies and programmes at the national level to identify the direction of technological development within the country; and a network of global institutions, financial mechanisms and technological programmes to support the institutions, policies and programmes in developing countries.

Part II of this volume deals with non-state agency in global climate governance. Pattberg and Stripple (this volume, Chapter 9) first map this multifarious and complex emerging transnational arena of global climate governance, in which

agency is constructed, maintained and challenged not only by central governments but also by a host of other actors such as non-governmental organizations, business actors, scientists and sub-national governments.

In more detail, Pattberg (this volume, Chapter 10) then discusses different forms of networked climate governance and evaluates their impacts with regard to problem-solving capacity, the democratic legitimacy of global environmental governance and the nature of their linkage to the international climate regime. Empirical illustrations include global city networks, public–private partnerships concluded within the context of the World Summit on Sustainable Development, and disclosure-based corporate social responsibility schemes.

Stripple and Lövbrand (this volume, Chapter 11) complement this study by offering a detailed case study on the creation and transformation of carbon markets. Rather than asking which entities govern carbon markets, they address the question of how and by which procedures carbon markets are rendered thinkable and operational in the first place. To that end, they study baseline-and-credit markets in particular, where a complex measurement of counterfactuals (current emissions vis-à-vis a business-as-usual scenario) enables reductions of carbon dioxide-equivalents to be assigned a market value and be transformed into various ‘offset currencies’.

Den Elzen and colleagues (this volume, Chapter 12) take a different perspective by focusing on the Triptych approach that differentiates allocation of emissions reductions based on sectoral targets that involve non-state actors through economic sectors in greenhouse gas mitigation. They argue that decomposing targets according to sectors provides for a more direct involvement of non-state actors in emission reduction targets. The framework also allows for discussions on sectors that compete worldwide. The disadvantage is that it requires projections of sectoral growth rates for each country.

In Chapter 13, Alfsen and colleagues address the question of innovation by looking at research-and-development policies and the role of agency therein. They argue that international agreements are best suited to boost research and development on climate friendly technologies, and that research-and-development agreements and cap-and-trade agreements are mutually supportive because research and development reduces future abatement costs and thus allows politicians to agree on tighter caps. Cap-and-trade strengthens a research and development programme because the latter becomes more efficient when a price on emissions stimulates innovation. Research and development and cap-and-trade should thus not be seen as alternatives or substitutes, but as mutually supportive elements in an effort to tackle climate change.

Part III of this volume then presents the core findings of this research programme on global adaptation governance.

First, Biermann and Boas (this volume, Chapter 14) map the challenge of global adaptation governance. They emphasize the difficulties in designing effective

research designs that appraise the performance of governance options for future climate change impacts that are merely predicted, but in essence unknowable in type and degree of harm. Also, they sketch the core areas of global governance that are likely to be negatively affected by the impacts of global warming in the twenty-first century. Chapter 14 thus serves as an outline of a major research effort on global adaptation governance. Chapters 15–18 present first findings from the ADAM Project in this field, all of which require further research and refinement.

Hof and colleagues (this volume, Chapter 15) present a state-of-the-art study on adaptation in integrated assessment models. They start with the observation that the explicit consideration of adaptation is still in its infancy in integrated assessment models that aim at supporting climate policy by analyzing economic and environmental consequences and by formulating efficient responses. Hof and colleagues try to fill this gap in integrated assessment models by integrating adaptation and residual damage functions from the AD-RICE model with the FAIR model. This version of the FAIR model (called AD-FAIR) allows analysis of the interactions between mitigation, emission trading, adaptation and residual damages on a global as well as regional scale. Adaptation is modelled here explicitly as a policy variable, which provides insights in the economic consequences of adaptation.

The question of the costs of climate change is addressed from a different perspective also by Biermann and Boas in Chapter 16. This chapter presents a policy analysis of possible governance systems to recognize, protect and resettle millions of climate refugees that may have to give up their homes over the course of this century due to sea-level rise or water scarcity. Biermann and Boas study a number of existing governance mechanisms and conclude that new approaches and institutions are needed. In particular, they sketch a proposal for a new intergovernmental agreement on the recognition, protection and resettlement of climate refugees that could be adopted as a protocol or otherwise integral part of futures climate agreements.

Chapter 17 reviews the debate on global adaptation governance – similar to Chapters 7 and 8 – from the perspective of developing countries. Ayers, Alam and Huq (this volume, Chapter 17) argue that past policies resulted in a framing of adaptation that is inappropriate for addressing the myriad developing country concerns in this field. What is needed, according to Ayers, Alam and Huq, is thus a reframing of the adaptation agenda to ensure that developing country priorities can be met comprehensively and consistently. In particular, they argue that adaptation must be taken as seriously as mitigation and that a more comprehensive and operational approach to adaptation must be taken, including substantial and mandatory financial commitments and a legal framework for adaptation. Eventually, they suggest that adaptation concerns may better be achieved under a different type of international architecture, outside mitigation governance. This could be an independent ‘adaptation protocol’, with a more flexible definition of adaptation

and operationizable targets and guidance on adaptation funding and action, which is in line with proposals by Biermann and Boas (this volume, Chapter 16) for a climate refugee agreement.

Jerneck and Olsson (this volume, Chapter 18) complement these reflections on the Southern perspective by adding a particular emphasis on the poorest of the poor, described as the ‘bottom-billion’ of human society. As they analyse in detail, it is these people who are likely to be the most affected by the impacts of climate change, who are the least responsible for the causation of the problem, and who have the least means to respond to the emerging crisis. Jerneck and Olsson thus focus on the South–North conflict in climate governance but add another perspective of those people in the developing world that are likely to suffer most. They suggest that policies intended for poverty eradication may have unintended consequences in marginalizing some groups, strengthening social stratification of the poor and contributing to the reproduction of ‘the poorest of the poor’. Policy-making for adaptation must thus seek to avoid such marginalization. Jerneck and Olsson eventually call for a rethinking of development from a sustainability perspective rather than mainstreaming climate change and adaptation into the narrower paradigm of development.

Finally, in Chapter 19 the editors provide an extensive summary and review of the overall results of this three-year research effort that involved more than 30 researchers. There is no single answer but a patchwork of findings. The overall findings of this programme, as summarized in Chapter 19, reflect the diversity of the problem by offering a diversity of elements that can point to more effective and equitable governance beyond 2012. The findings emphasize the benefits of more integrated governance architectures as opposed to more fragmented architectures; emphasize problems of privatization in terms of possibly lower performance, legitimacy and equity, while acknowledging also some benefits of the privatization of parts of global climate governance; and emphasize the need for better integrated, focused and financed systems of global adaptation governance. Last but not least, this book shows the urgent need not only for new governance, but also for new and additional governance research. We hope this volume will make a contribution to this important debate on developing policy options for effective, equitable and legitimate climate governance beyond 2012.

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