Conclusions: Options for Effective Climate Governance beyond 2012

Biermann, Frank; Pattberg, Philipp; Zelli, Fariborz

Published in:
Global Climate Governance Beyond 2012. Architecture, Agency and Adaptation.

2010

Document Version:
Peer reviewed version (aka post-print)

19

Conclusions: options for effective climate governance beyond 2012

FRANK BIERMANN, PHILIPP PATTBERG
AND FARIBORZ ZELLI

19.1 Introduction

The diversity of the contributions to this volume illustrates the complexity of the challenge. Climate change is a governance problem that needs to be analysed, and addressed, at multiple levels, in multiple sectors, and with a view to multiple actors. In searching for policy options that go beyond current negotiations, the contributions thus addressed issues as diverse as international carbon markets, overlaps between the climate convention and world trade law, the role of non-state actors in technological change, climate refugees, or the vulnerability of the poorest of the poor. The chapters approached these issues from a variety of methodological approaches, showing that the governance challenge of global climate change can be framed very differently.

In light of this complexity, this book did not seek to present a silver bullet for future climate governance. An all-inclusive and perfectly coherent account of policy options would be neither feasible nor would it be desirable given the diversity of interests, perspectives and issues. As Einstein reportedly advised, it is important to simplify a problem to the extent possible – but not more. Instead of applying a structural straitjacket, this book thus offers a broad array of policy options organized under the three research themes of architecture, agency and adaptation. We summarize these options now in Sections 19.2–19.4. Finally, in Section 19.5 we map the policy options according to their political dimensions and institutional settings, illustrating their differences but also the opportunities for joint negotiation and implementation.

19.2 Architecture

A core element of the quest for long-term stable and effective climate governance is the overall institutional architecture. We define the term 'global governance

Global Climate Governance beyond 2012: Architecture, Agency and Adaptation, eds. F. Biermann, P. Pattberg and F. Zelli. Published by Cambridge University Press.

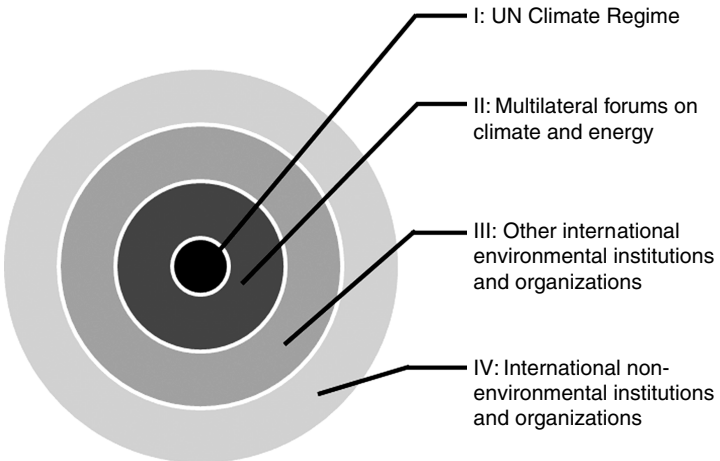

Figure 19.1 Spheres of institutional fragmentation in global climate governance. *I: UN climate regime*: includes for example the Ad Hoc Working Group on Long-Term Co-operative Action under the Convention and the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol. *II: Multilateral forums on climate and energy*: includes for example the Asia–Pacific Partnership on Clean Development and Climate; the Methane to Markets Partnership; the Carbon Sequestration Leadership Forum; the International Carbon Action Partnership; the International Partnership for the Hydrogen Economy; and the Major Economies Process on Energy Security and Climate Change. *III: Other international environmental institutions and organizations*: includes for example the World Meteorological Organization; the Convention for the Protection of the Marine Environment of the North-East Atlantic; the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat; the Convention on Biological Diversity; and the United Nations Convention to Combat Desertification; the World Trade Organization; the International Civil Aviation Organization; the International Maritin.

architecture' as the overarching system of public and private institutions – that is, principles, norms, regulations, decision-making procedures and organizations – that are valid or active in a given issue area of world politics. Architecture can thus be described as the *meta-level* of governance (Biermann *et al*., this volume, Chapter 2).

In policy and academic debates, there is increasing concern for widespread fragmentation of global governance architectures. Global climate governance, in particular, is marked by a plethora of institutions that are not always effectively related to the overarching Climate Convention (see also for example Haas *et al*. 2004; Kanie 2008). Regarding intergovernmental institutions, there are four different spheres of fragmentation in international climate politics, which can be arranged concentrically from 'purely' climate-specific institutions towards regimes and organizations with universal or cross-cutting portfolios (see Figure 19.1 for an overview). If one considers in addition private and public–private initiatives, the global

climate architecture appears even more fragmented (see Chapters 9–13, this volume, on agency beyond the state).

Fragmentation may have advantages (Zelli *et al*., this volume, Chapter 3). One benefit of institutional fragmentation is that it may permit laggards to get to the negotiation table. For instance, the current internal fragmentation or duplication in the UN climate regime – with various parallel tracks for negotiating a future regime – allows for the direct involvement of countries that have not ratified the Kyoto Protocol to participate in discussions about a successor agreement. Notably, the United States participated in the Convention Dialogue in 2006 and 2007 and afterwards in the Ad Hoc Working Group on Long-Term Co-operative Action under the Convention. Similarly, a fragmented governance architecture may provide more venus for including non-state and sub-state actors. For instance, major businesses are involved in multilateral technology initiatives such as the International Partnership for the Hydrogen Economy. Another advantage of fragmentation is the potential for a meaningful division of labour among institutions. Instead of overburdening the UN climate regime, other institutions can take over certain functions. Fragmentation might also allow for deeper or faster agreements by circumventing deadlocks in larger forums. For instance, the 2007 meeting of the Group of Eight was the first multilateral arena where major developed country emitters made (soft) commitments to reduce greenhouse gas emissions by at least 50 per cent by 2050. This agreement also helped to reinvigorate debates in other institutions, by providing a major impetus on the road to the Conference of the Parties 2007 in Bali.

Yet there are also many, and possibly more severe costs involved with heavy fragmentation of governance architecture (Zelli *et al*., this volume, Chapter 3). First, fragmentation of governance architectures gives room for many initiatives that serve only particular interests. The bulk of multilateral partnerships on climate and energy do not include least-developed countries or small island states. They hence largely focus on the interests of the participating industrialized or newly industrializing countries, while sidelining preferences of poorer countries. Notably, adaptation has marginal roles in the Asia–Pacific Partnership and in the first session of the United States-initiated Major Economies meeting. Moreover, fragmentation might increase coordination gaps among institutions. For instance, at present coordination on adaptation is poor between the climate convention and other institutions, for example the United Nations Food and Agriculture Organization or the desertification convention. Regulatory uncertainty is another severe downside of fragmentation, especially where clear price signals and investment security are important. For example, the variety of unlinked emission trading schemes yields a patchwork of different conditions for the generation and transfer of emission credits and permits (Flachsland *et al*., this volume, Chapter 5). Scholars have also pointed to the

imminent danger of 'chill effects' (Eckersley 2004). In light of the strong dispute settlement system under the World Trade Organization, parties might have been reluctant to include further trade-restrictive measures in the UN climate regime, let alone strengthening the regime's own dispute settlement system. Finally, institutional diversity implies the risk of 'forum shopping' (Raustiala and Victor 2004: 280). The Asia–Pacific Partnership for instance has provided a forum for the United States (and initially Australia) to circumvent the UN climate regime. In the same vein, the success of such initiatives might reduce compliance incentives for parties of the Kyoto Protocol (van Asselt 2007).

How can the environmental effectiveness of different scenarios of institutional fragmentation be quantified in both the short and the long term? This has been analysed in detail by Hof *et al*. (this volume, Chapter 4), building on earlier projections made with the FAIR meta-model for different levels of institutional cooperation among countries (Boeters *et al*. 2007) as well as on a review of other quantitative studies about the costs and environmental effectiveness of different universal and fragmented regimes. One of their chief conclusions is that it is more cost-effective to reduce emissions in a universal regime than in a fragmented regime. Even with high participation, fragmentation implies that emission are not reduced where it is cheapest, since emission trading is usually impossible between regions that participate in different agreements. However, despite the higher overall costs, a fragmented regime consisting of multiple agreements could be more feasible to attain, as it limits incentives for free riding.

In sum, in light of the findings from both qualitative and quantitative research, a strongly integrated climate architecture appears to be the most effective solution. However, in current climate governance as well as in many other areas of world politics, such integrated architectures are not always realistic. The second-best solution may thus be a well coordinated 'web of institutions' (IPCC 2007b: 791) that ensures an enhanced division of labour not only among climate-related institutions, but also with institutions from different issue areas, including the world trade regime.

Building on these overall findings, several contributions to this volume study specific institutional overlaps around the UN climate regime. One chapter analyses internal fragmentation within core climate institutions with regard to emissions trading and prospects for a global carbon market (Flachsland *et al*., this volume, Chapter 5). Article 17 of the Kyoto Protocol as specified in the later Marrakech Accords establishes a top–down approach, that is, the implementation of emissions trading through multilateral negotiations. On the other hand, there are so-called bottom–up approaches associated with decentralized decision-making of individual nations or sub-national entities that implement emissions trading systems unilaterally, bilaterally or plurilaterally. Members to the International Carbon Action Partnership – including the EU Commission and several EU Member States, Australia, New

Zealand and some US states – emphasize the implementation and linking of such bottom–up schemes. This would imply a stepwise implementation of a global carbon market, compared to the instantaneous implementation of a Kyoto-type trading system.

Using the REMIND model, Flachsland *et al*. (this volume, Chapter 5) analysed the economic costs of delaying the implementation of a comprehensive global trading system. They found that when a global carbon market is implemented by 2020 instead of 2010, global mitigation costs would increase from 1.3 to 2.8 per cent of the global discounted Gross Domestic Product. If the global carbon market is initiated later (that is, 2025 and after), the model predicts that it becomes impossible to limit global temperature increases to 2 °C.

While a global top–down trading approach under a universal architecture is the best solution to control global emissions but may not be realistic in the short term, the second-best option, similar to the conclusions by Hof *et al*. in Chapter 4, would again be a web of institutions. For emissions trading, such a web implies combining elements of different carbon market architectures. For instance, governments could agree on a system where a group of countries that want to adopt binding economy-wide caps continues the intergovernmental cap-and-trade system implemented by the Kyoto Protocol after 2012. By linking their domestic trading systems within this government-level framework, they can devolve trading to companies, which will enhance the efficiency of the international carbon market. This architecture could be designed as an open system that enables other countries to join later with some or all sectors if their economy. This approach could be environmentally and economically more effective than pure bottom–up approaches and less prone to political stalemates and high transaction costs than the top–down approach (Flachsland *et al*., this volume, Chapter 5).

Another case study analysed fragmentation between the UN climate regime and a non-environmental institution, namely the world trade regime. There are various overlapping policies in both regimes (Biermann and Brohm 2005; van Asselt and Biermann 2007; Zelli 2007), including trade in emission allowances, unilateral policies and measures to level the playing field (for example border tax adjustments, subsidies and technical standards), as well as the transfer of climate-friendly goods, services and technologies. Zelli and van Asselt (this volume, Chapter 6) conducted a theory-guided policy analysis of these overlaps, along with a major international stakeholder workshop jointly organized with the Economics and Trade Branch of the UN Environment Programme in Geneva. One policy option that emerged is to better integrate scientific expertise, for example in the Committee on Trade and Environment of the World Trade Organization, the major forum where environment–trade overlaps are discussed. Another option to involve expertise is the introduction of science-based sustainability criteria for the removal of trade barriers for climate-friendly goods and services. A third policy recommendation is

to broaden coordination across institutions to overcome negotiation deadlocks in this committee. Such a dialogue could cut across ministries instead of continuing separate ministerial gatherings. Moreover, at the governmental level, strategic issue linkages could lead to package deals. One option would be to link positions on farm subsidies, trade barriers for environmental goods and services and trade barriers for biofuels. Concessions on biofuels or environmental goods and services might help reinvigorate the larger debate on farm subsides.

The last two chapters in the first part of this volume addressed the global climate architecture as a whole, emphasizing the North–South dimension. Winkler (this volume, Chapter 7) explored options for long-term cooperation based on the principle of equity. He focused on two possible scenarios for a future architecture. First, he discussed a multi-stage package where countries progress from one level of participation and commitment to another. For this package, equity implies that transitions between stages are based on income levels, population size, historical responsibility and the potential to mitigate. As a second option, Winkler considered an 'ambitious transitional' package. This package has a stronger bottom–up character than the first one, but nonetheless requires more urgent action by all parties, especially in terms of quantifiable commitments. Such architecture not only implies stricter mitigation targets for industrialized countries, but also incentives for enhanced mitigation activities by developing countries. Here, the equity principle requires a differentiated approach, allowing developing countries to take quantifiable actions based on their respective national circumstances. Winkler concludes that both packages should not be seen as alternatives, but as different stages in the evolution of the climate regime over the next years and decades.

A similar perspective is taken by Shrivastava and Goel (this volume, Chapter 8). They emphasize the relevance of technological capability and financial support for developing countries and the need for support from industrialized countries. They suggest a two-tier architecture of global climate governance 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. In their view, these institutional arrangements at the global level would give a strong signal to developing countries and may alleviate their concerns in taking a more active part in global efforts to address climate change.

19.3 Agency

A number of scholars have voiced concerns about the problem-solving capacity of the state and the international state system. Increasingly, scholars and practitioners

alike acknowledge that solutions to the challenges of global change do not exclusively originate from governments and international organizations but are co-produced by a host of actors beyond the state, whose authority is contested and whose legitimacy is questionable. On this account, climate governance is no longer the domain of states and intergovernmental cooperation alone. Instead, scholars observe a growing relevance of non-state actors, such as industry and environmentalist groups, as well as public actors other than central governments, such as cities, local communities or international bureaucracies (Benecke *et al*. 2008; Kolk *et al*. 2008; Kern and Bulkeley 2009; Okereke *et al*. 2009). Increasingly, such actors assume a role in rule-setting institutions that regulate certain sectors, or in market-based mechanisms, such as emissions trading. This emergence of 'transnational' and often 'privatized' climate governance required, first, a detailed conceptualization of this new phenomenon (Pattberg and Stripple, this volume, Chapter 9), which drew on political science and international relations studies of the public/private divide and different spheres of authority (for example Börzel and Risse 2005).

The starting point has been that 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' (Thynne 2008: 329). Especially in climate governance, numerous actors form institutions to address the problem of climate change without being forced, persuaded or funded by states and other public agencies. This transnational institutionalization of climate governance is in line with what Ruggie (2004) has called the reconstitution of a global public domain. As a domain, it does not replace states but 'embed[s] systems of governance in broader global frameworks of social capacity and agency that did not previously exist' (Ruggie 2004: 519). The original claim about 'agency beyond the state' concerns the role and relevance of different actors. The power of individual and collective actors to change the course of events lies increasingly in sites beyond the state and its international organizations (Pattberg and Stripple, this volume, Chapter 9). Based on this conceptualization of the emergent transnational climate governance arena and agency beyond the state in climate governance, Pattberg and Stripple developed a typology that distinguishes different climate governance approaches. These range from governance through markets – including the Clean Development Mechanism and voluntary offsets – to networked governance, which includes public non-state actors such as cities along with transnational corporations and non-governmental organizations.

Subsequently, more detailed research focused on particular elements of the emergent transnational climate governance. First, Pattberg (this volume,

Chapter 10) analysed *networked forms of global climate governance*. Public–private partnerships – that is, networks of different societal actors, including governments, international agencies, corporations, research institutions and civil society organizations – are cornerstones of current global environmental governance, both in discursive and material terms. Within the United Nations, partnerships have been endorsed through the establishment of the Global Compact, a voluntary partnership between corporations and the United Nations, as well as through the 'partnerships for sustainable development' (also known as 'type-2' outcomes) concluded at the 2002 World Summit on Sustainable Development in Johannesburg. Both the 'partnerships for sustainable development' and the Global Compact have been criticized for privatizing parts of the policy response to global change (Biermann *et al*. 2007; Rieth *et al*. 2007). Pattberg (this volume, Chapter 10) analysed public–private partnerships in global climate governance based on three criteria: problem-solving capacity; participation and inclusiveness; and synergies or dysfunctional linkages with international climate governance.

As for problem-solving capacity, several obstacles prevent the realization of the full potential of partnerships. In particular, the geographical bias towards global partnerships indicates that partnerships reflect pre-existing interest structures and therefore seldom deliver benefits that may not have been realized in more traditional multilateral or bilateral implementation arrangements. Regarding increased participation through public–private partnerships, the analysis highlights the overrepresentation of governments in climate partnerships as compared to the total sample of all partnerships for sustainable development registered with the United Nations. Climate partnerships are also largely dominated by states, in terms of both leadership and membership. This finding is in line with the expectation that politically contested areas such as climate politics remain overall under the control of governments. Finally, it appears that a stronger link with the UN climate regime may benefit both the 'partnerships for sustainable development' – by giving them guidance and a clear goal – and the climate regime, by assisting its implementation.

Second, Stripple and Lövbrand (this volume, Chapter 11) analysed the processes that drive the current transformation of current carbon markets. Instead of asking who governs carbon markets, they rather explore by which procedures carbon markets are rendered thinkable and operational in the first place. To this end, Stripple and Lövbrand analysed 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 market value and transformed into various offset currencies. Through the detailed analysis of the global supply chain of two concrete carbon offset contracts, they scrutinized the role of a wide range of actors beyond the state, including investors, developers, managers, auditors, brokers, retailers and buyers as well as individuals.

The analysis suggests that these actors perform a range of governance functions, including enhancing the credibility of offsets, providing information, enabling aggregation, facilitating transactions, influencing regulation and adjudicating conflicts. While their empirical observations signify a shift from hierarchical forms of government to more decentralized forms of regulation, Stripple and Lövbrand (this volume, Chapter 11) did not interpret carbon market governance as a retreat of politics or of the state in favour of the market. Instead, they understood agency beyond the state as a distinct form of political organization that governs social behaviour 'at a distance'.

Third, den Elzen *et al*. (this volume, Chapter 12) modelled mitigation efforts from economic sectors in industrialized and developing countries. They drew on the 'Triptych approach', a method for allocating future greenhouse gas emission reductions among countries under an international mitigation regime that may follow the Kyoto Protocol and be based on technological criteria at sector level. Targets are defined for industry (manufacturing and construction), domestic (including carbon dioxide emissions from the residential, commercial, agriculture and inland transport sectors), power production, fossil fuel production, non-carbon dioxide emissions in agriculture, and waste. Defining targets for separate sectors allows linking real-world emission reduction strategies and makes it possible to take diverse national circumstances of countries better into account. The major advantage of this sectoral approach is that it puts internationally competitive industries on the same level playing field. However, one of the major challenges is establishing reliable, uniform sectoral emissions registrations for all countries, as currently reliable sectoral emissions data for many (especially developing) countries is lacking.

Finally, Alfsen, Eskeland and Linnerud (this volume, Chapter 13) have analysed the role of non-state actors with regard to research and development and technological change. While standard economic theory recommends that governments set a price on emissions, they argued that market imperfections and dynamic inconsistencies may require that in addition governments support far-reaching technological change by means of publicly funded research, development and demonstration. In fact, public funding of research and development and carbon pricing policies are, at least in theory, mutually supportive and should not be seen as alternatives. An international agreement on research and development funding and cap-and-trade systems are mutually supportive precisely because research and development reduces future abatement costs and thus makes it feasible for politicians to agree on tighter caps. With regard to the policy instruments used, Alfsen, Eskeland and Linnerud contend that in the near future, a mix of different policies will coexist, including standards and labelling, instruments that reward not effort but results (for example prizes for a given solution), public procurement as well as research contracting that involves research institutes and industry.

19.4 Adaptation

It becomes increasingly clear that despite all mitigation efforts, some degree of global warming cannot be prevented, and impacts from climate change will become a reality of the twenty-first century. This poses the question of optimal adaptation governance. While a number of research programmes have addressed adaptation governance at local and national levels (including in the ADAM Project: see Hinkel *et al*. 2010; Mechler *et al*. 2010), the chapters gathered here ventured into a largely unexplored research terrain: *global* adaptation governance. How can we build over the course of the next decades systems of global governance that will cope with the global impacts of climate change that require adaptation? What institutions are in need of redesign and strengthening? To what extent, and in what areas, do we need to create new institutions and governance mechanisms from scratch?

As Biermann and Boas (this volume, Chapter 14) illustrate, global adaptation governance will affect most areas of world politics, including many core institutions and organizations. The need to adapt to climate change will influence for example the structure of global food regimes, global health governance, global trade flows and the world economic system as well as many other sectors from tourism to transportation or even international security.

Yet how can the damages of climate change, as well as the possible costs of adaptation, be assessed and, if possible, quantified? Hof *et al*. (this volume, Chapter 15) report on the most recent quantitative research on adaptation costs that underscores the urgency for international action. They combined the FAIR meta-model and the AD-RICE model (de Bruin *et al*. 2009) to analyse the mitigation costs, adaptation costs and residual damages of climate change on a global as well as regional scale. For a 'contraction and convergence' emission allocation regime (with per capita emissions converging in 2050, a climate sensitivity of 3.0 °C and the United Kingdom Green Book discounting method), the projected global adaptation costs are of the same order of magnitude as the recent adaptation cost estimates of the World Bank (2006) and the Secretariat of the Climate Convention (UNFCCC 2007). They show that although the share of adaptation costs in the total climate change costs is relatively small, adaptation plays a major role by reducing potential damages. The extra costs if no adaptation measures are taken (defined as the increase in residual damages minus the decrease of adaptation costs) are projected to amount to USD 30 billion globally in 2010 and increase sharply to USD 3.4 trillion in 2100. Investment in adaptation is therefore very effective: residual damages are on average reduced by about five dollars for every dollar invested in adaptation. Furthermore, adaptation and mitigation cannot be regarded as substitutes, but rather complement each other. Adaptation can effectively reduce climate change damages in the shorter run, but is much less effective in the end since

it does not reduce climate change itself. Mitigation is very effective in reducing climate change damages in the long run. Implementing both adaptation and mitigation gives the best results according to the FAIR meta-model.

Building on these insights, this project analysed three challenges for future global adaptation governance: climate change-induced migration (Biermann and Boas, this volume, Chapter 16); climate-change induced food insecurity (Massey 2008); and the need for coordinated adaptation funding (Klein and Persson 2008). In addition, two specific analyses focused on the perspectives of developing countries as a group of nations (Ayers, Alam and Huq, this volume, Chapter 17) and the interests of the poorest of the poor (Jerneck and Olsson, this volume, Chapter 18).

As for migration, it is likely that climate change will fundamentally affect the lives of millions of people who may be forced over the next decades to leave their villages and cities to seek refuge in other areas. Biermann and Boas (this volume, Chapter 16) defined these people as 'climate refugees': as people who have to leave their habitats, immediately or in the near future, because of sudden or gradual alterations in their natural environment related to at least one of three impacts of climate change: sea-level rise, extreme weather events, and drought and water scarcity. The exact numbers of such future climate refugees are unknown and vary from assessment to assessment depending on underlying methods, scenarios, time-frames and assumptions, and Biermann and Boas (this volume, Chapter 16) concur that estimation methods and assumptions are complex and controversial. Yet despite these remaining uncertainties, a meta-analysis of all available studies indicated that the climate-change-induced refugee crisis is most likely to surpass all known refugee crises in terms of the number of people affected (Biermann and Boas, this volume, Chapter 16).

Yet the current refugee protection regime of the United Nations is poorly prepared, and does not cover climate refugees in its mandate. At a meeting in the Maldives in 2006, delegates proposed therefore an amendment to the 1951 Geneva Convention Relating to the Status of Refugees that would extend the mandate of the UN refugee regime to cover also climate refugees. But such an amendment, as argued by Biermann and Boas (this volume, Chapter 16), leads into the wrong direction. They argue therefore for a separate regime: a legally binding agreement on the recognition, protection and resettlement of climate refugees under the climate convention. This could be a separate protocol under the convention ('climate refugee protocol'), but also integral part of a larger legal instrument, such as a protocol on adaptation, or even a single undertaking that regulates all future measures on climate governance (Biermann and Boas, this volume, Chapter 16). Importantly, the protection of climate refugees must be seen as a global problem and a global responsibility. In most cases, climate refugees will be poor, and their own responsibility for the past accumulation of greenhouse gases will be small. By a

large measure, the rich industrialized countries have caused most emissions in past and present, and it is thus these countries that have most moral, if not legal, responsibility for the victims of global warming. Industrialized countries should hence do their share in financing, supporting and facilitating the protection and the voluntary resettlement of climate refugees.

A second case study focused on a related challenge – food security (Massey 2008). A changing climate will significantly affect many communities that are faced today with hunger and malnutrition. Key impacts on agriculture are a depletion of groundwater, reduced precipitation and changes – primarily a shortening – of the growing season, all of which may reduce yields. For example, the IPCC Fourth Assessment Report suggests that a 2–3 °C range of warming by 2020 could decrease agricultural yields in Africa by as much as 50 per cent (IPCC 2007a: 447–448). Therefore, some form of adaptation must occur to ensure greater food security in the most vulnerable regions. Our research indicates that there needs to be a mechanism that allows for adaptation at the local level to help farmers and communities and at the same time ensures that there is a well-functioning institutional system at the global level that supports the financing and implementation of adaptive measures, including improved farming techniques and technologies.

One potential means of adaptation to meet this challenge could be improved access of farmers in developing countries to state-of-the-art research on farming technologies. So far, developing countries are at a competitive disadvantage as a result of funding for agricultural research in general, including the protection offered to more adaptive crop seeds due to international intellectual property rights. Developed countries as well as the private sector may thus have a special role in aiding the farming sector in developing countries to adapt. This support could come in the form of an adaptation levy to fund agricultural research in developing countries as well as a renegotiation of international intellectual property rights in the domain of agriculture. The overall institutional context could be strengthened through a legally binding agreement on adaptation and food security under the climate convention (Massey 2008). This could be a single agreement – such as a protocol to the Climate Convention – but also be integrated (possibly with the agreement on climate refugees outlined above) into a larger legal instrument, such as an adaptation protocol to the Climate Convention. In addition, as discussed earlier under the 'architecture' domain, discussions on farm subsidies and transfer of technologies could be coupled with adaptation-related concerns, for example through sustainability criteria for trade barrier removals.

Adaptation is clearly a key priority for most developing countries, many of which have contributed only marginally to the build-up of greenhouse gases in the atmosphere but which will be especially affected by climatic change. Ayers, Alam and Huq (this volume, Chapter 17) thus examined the current discourses and

negotiations on adaptation to climate change from the perspective of developing countries. Their analysis also took into account debates on a major workshop on Southern perspectives that the ADAM Project organized in 2008 in New Delhi, India. Ayers, Alam and Huq concluded that although significant progress has been made on empowering the adaptation agenda within the climate governance architecture, this resulted in a framing of adaptation that is inappropriate for addressing the many developing country concerns. First, they argue, adaptation remains under existing frameworks an undervalued policy option relative to mitigation. Second, they see the type of adaptation favoured by the Climate Convention as not conducive to building the broader resilience that is necessary to reduce the vulnerability of developing countries. Third, they view the adaptation discourse under the Climate Convention as largely technical and not open to alternative types of expertise that are locally generated and non-technical. In sum, Alam, Ayers and Huq suggest that it is both necessary and possible to refine the adaptation agenda under the Climate Convention. According to them, more deliberative policy-making processes must be created for adaptation that are better able to engage with vulnerable communities and citizens to create bottom–up, locally meaningful adaptation strategies. This would require a reframing of the adaptation discourse that is more open to non-technical expertise generated from indigenous and locally based knowledge.

In addition to a comprehensive analysis of the perspectives of the developing countries, this research programme also explored the special situation of the poorest people in these countries (Jerneck and Olsson, this volume, Chapter 18). In the context of the poorest of the poor, mitigation is not a priority because their contribution to the global emission of greenhouse gases is miniuscule and their capacity to reduce emissions is low. This makes adaptation their main priority. Today, there are 923 million hungry people worldwide, who are in general also extremely vulnerable to climate change impacts. The already large number of poor people is expected to increase further and remain large for a long time while people exposed to climate change are expected to become even more vulnerable due to increasing incidence of extreme climate events. In relation to the poorest of the poor, adaptation to climate change should thus be seen as a process of profound social change away from livelihoods threatened at their roots by climate change.

Several policy options were considered to increase the adaptive capacities of the poorest of the poor. These include mainstreaming climate change into development assistance; identifying synergies with other mechanisms, such as climate change mitigation, biodiversity or desertification; as well as a number of stand-alone adaptation policies, such as special support for climate refugees (Jerneck and Olsson, this volume, Chapter 18). Regarding new norms and institutions, the study argued for rethinking development from a sustainability perspective rather

than mainstreaming climate change and adaptation into the narrower paradigm of development, even though mainstreaming may be the only option for the medium term.

The integrated assessment modelling of adaptation costs and our studies on climate refugees, food insecurity, the perspectives of developing countries and the needs of the poorest among the poor signal the need for an enhanced and targeted set of funding mechanisms for adaptation. It is thus not only important to better endow existing funds and to add new funds, but to coordinate the various financial mechanisms in order to reach a meaningful division of labour. We therefore also studied adaptation funding, including a participatory appraisal exercise with stakeholders and experts from developing and developed countries in Brussels (Klein and Persson 2008).

19.5 Synthesis

This chapter has summarized a three-year research effort on policy options for stable, long-term climate governance, carried out by seven research institutions in Europe and India. The research reported in this volume focused on three areas of rapid political development as well as increasing concern: the research problem of increasing fragmentation of the overall architecture of global climate governance; the research problem of increasing privatization and marketization of global climate governance; and the research problem of developing new mechanisms for global adaptation governance. All themes are interlinked. For instance, most options discussed under agency and adaptation include elements of a future climate architecture, for example reform of the Clean Development Mechanism, or protocols on climate refugees and food security. Options discussed under the 'architecture' theme involve non-state actors (for example the linking of emissions trading schemes) or may be relevant for adaptation to climate change (for example technology transfer).

This concluding section highlights connections between the various policy options. To this end, Table 19.1 restructures the options in terms of the international institutional environment where they could be pursued: under the UN climate regime, in other international organizations and forums, or in cross-institutional collaboration. Moreover, the table distinguishes options depending on their political and legal dimension: either they suggest new political 'hardware', that is, new norms, treaties or institutions, or they propose specific policies, measures or standards. These two dimensions take into account two crucial aspects to be considered when feeding recommendations into the negotiation process: *where?* (institutional setting) and *what*? (nature of proposal, level of ambition). These criteria are more suitable to structure policy-relevant findings, while the three themes have helped structuring and guiding research.

Table 19.1 *Overview of options for global climate governance beyond 2012*

	UN climate regime	Other international institutions and forums	Cross-institutional collaboration between UN climate regime and others
Norms and institutions	Ambitious comprehensive successor agreement to the Kyoto Protocol with differentiated commitments of countries Strengthened international institutions on adaptation, including: • a legally binding agreement on the recognition, protection and resettlement of climate refugees under the climate convention • an agreement on adaptation and food security under the climate convention • a climate refugee protection and resettlement fund	Cross-ministerial dialogue among environment, trade and development ministries Opening World Trade Organization Committee on Trade and Environment for regular scientific inputs on climate–trade overlaps Public funds to stimulate private research and development Multilateral agreements on research and development of climate-friendly technologies	Open EU emissions trading scheme and link emissions trading schemes bottom–up and top–down International body of experts on technological needs and adaptive capacities Network of technology research and development institutes Fund for technology research, development and diffusion
Policies, measures and standards	Differentiation among Clean Development Mechanism target countries, project types and technologies Sectoral Clean Development Mechanism pilot phase with discounted sectoral credits Sectoral mitigation targets Science-based sustainability standards for Clean Development Mechanism projects	Science-based sustainability criteria for removal of trade barriers for climate-friendly goods and services Issue-linking and package deals on related discussions in the World Trade Organization Doha Round (for example farm subsidies, transfer of environmental goods and services, biofuels) Deliberative adaptation policy-making processes	Focused national, regional and local policies targeting the poorest of the poor – incentivized by international framework

Based on these two dimensions, Table 19.1 highlights the commonalities among policy options that have been analysed under the three research themes. The columns show to what extent some options can be pursued in the same institutional arena and might hence be linked in a comprehensive negotiation approach (for example protocols on climate refugees and food security). Most suggestions fall under the UN umbrella or in the middle column that at least involves the UN regime. This is in line with our general finding that in spite of some benefits of institutional fragmentation, it is pivotal to strengthen the UN regime as the chief institution to address global climate change.

All policies, measures and standards listed in Table 19.1 relate to different institutional settings (inside and outside the UN system), with some sharing features such as sustainability criteria based on scientific advice for both CDM and trade barrier removals. There is an obvious linking potential here, since a scientific body as the IPCC could for instance provide broad expertise to develop criteria across different topics. The distinction between institutional and policy-based options also points to the variant political feasibility of options. Other things being equal, one can expect that agreement on new policies is easier to achieve than on new institutional instruments, for example, an open emissions trading scheme or a food security protocol.

One could also combine the dimensions according to technical or material commonalities, in the attempt to advance options in parallel in negotiations. Consider, for example, issues of funding (climate refugees funds, public research and development funds); scientific advice (for sustainability criteria for CDM and technology transfer and for the World Trade Organization Committee on Trade and Environment); trade (linkage of emissions trading schemes, issue-linking in the Doha Round on world trade); technology (research and development funding, CDM reform proposals, technology transfer); and sectoral approaches (sectoral CDM, sectoral mitigation targets, sector-based emissions trading schemes as part of an open trading system).

In the final analysis, and in light of the complexity of climate negotiations and the multitude of actors involved, it will be important, however, not to 'over-integrate' options before communicating them in the policy process. 'Optimal' yet highly complex and demanding combinations might overburden negotiations. The potential for concrete combinations of options in the governance process will depend on political bargaining as well as on ad hoc opportunities of daily politics. Future climate policy does not only need well-designed strategies for long-term effective, equitable and efficient governance architectures, but also a high degree of flexibility in actual operationalization and implementation. For the better or worse, climate governance, as most areas of policy-making, will always combine long-term vision with short-term incrementalism.

References

Asselt, H. van 2007. 'From UN-ity to diversity? The UNFCCC, the Asia-Pacific Partnership and the future of international law on climate change', *Carbon and Climate Law Review* 1: 17–28.

Asselt, H. van and F. Biermann 2007. 'European emissions trading and the international competitiveness of energy-intensive industries: a legal and political evaluation of possible supporting measures', *Energy Policy* 35: 497–506.

Benecke, G., L. Friberg, M. Lederer and M. Schröder 2008. *From Public–Private Partnership to Market: The Clean Development Mechanism (CDM) as a New Form of Governance in Climate Protection*, SFB Governance Working Paper Series 10. Berlin: Sonderfor\schungsbereich (SFB).

Biermann, F. and R. Brohm 2005. 'Implementing the Kyoto Protocol without the United States: the strategic role of energy tax adjustments at the border', *Climate Policy* 4: 289–302.

Biermann, F., P. Pattberg, S. Chan and A. Mert 2007. *Partnerships for Sustainable Development: An Appraisal Framework*, Global Governance Working Paper No. 31. Amsterdam: The Global Governance Project.

Börzel, T. A. and T. Risse 2005. 'Public–private partnerships: effective and legitimate tools of international governance', in E. Grande and L. W. Pauly (eds.), *Reconstructing Political Authority: Complex Sovereignty and the Foundations of Global Governance*. Toronto: University of Toronto Press, pp. 195–216.

de Bruin, K. C., R. B. Dellink and S. Agrawala 2009. *Economic Aspects of Adaptation to Climate Change: Integrated Assessment Modelling of Adaptation Costs and Benefits*. Paris: OECD.

Eckersley, R. 2004. 'The big chill: the WTO and multilateral environmental agreements', *Global Environmental Politics* 4: 24–40.

Haas, P. M, N. Kanie and C. N. Murphy 2004. 'Conclusion: institutional design and institutional reform for sustainable development', in N. Kanie and P. M. Haas (eds.), *Emerging Forces in Environmental Governance*. Tokyo: United Nations University Press, pp. 263–281.

Hinkel, J., S. Bisaro, T. E. Downing, M. E. Hofmann, K. Lonsdale, D. Mcevoy, J. D. Tàbara 2010. 'Learning to adapt: narratives of decision makers adapting to climate change', in M. Hulme and H. Neufeldt (eds.), *Making Climate Change Work for Us: European Perspectives on Adaptation and Mitigation Strategies*. Cambridge, UK: Cambridge University Press, pp.

IPCC 2007a. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.

IPCC 2007b. *Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.

Kanie, N. 2008. 'Towards diffused climate change governance: a possible path to proceed after 2012', in V. I. Grover (ed.), *Global Warming and Climate Change: Ten Years after Kyoto and Still Counting*. Enfield, NH: Science Publishers, pp. 977–992.

Kern, K. and H. Bulkeley 2009. 'Cities, Europeanization and multi-level governance: governing climate change through transnational municipal networks', *Journal of Common Market Studies* 47: 309–332.

Klein, R. J. T. and A. Persson 2008. *Financing Adaptation to Climate Change: Issues and Priorities*, ECP Report No 8. Brussels: Centre for European Policy Studies.

Kolk, A., D. Levy and J. Pinske 2008. 'Corporate responses in an emerging climate regime: the institutionalization and commensuration of carbon disclosure', *European Accounting Review* 17: 719–745.

Massey, E. 2008. 'Global governance and adaptation to climate change for food security', in F. Zelli (ed.), *Integrated Analysis of Different Possible Portfolios of Policy Options for a Post-2012 Architecture*, ADAM Project report No. D-P3a.2b. Norwich, UK: Tyndall Centre for Climate Change Research, pp. 143–153.

Mechler, R., A. Aaheim, S. Hochrainer, Z. Kundzewicz, J. Linnerooth-Bayer and N. Lugeri 2010. 'A risk management approach to assessing adaptation to extreme weather events in Europe', in M. Hulme and H. Neufeldt (eds.), *Making Climate Change Work for Us: European Perspectives on Adaptation and Mitigation Strategies*. Cambridge, UK: Cambridge University Press, pp.

Okereke, C., H. Bulkeley and H. Schroeder 2009. 'Conceptualizing climate governance beyond the international regime', *Global Environmental Politics* 9: 58–78.

Raustiala, K. and D. G. Victor 2004. 'The regime complex for plant genetic resources', *International Organization* 58: 277–309.

Rieth, L., M. Zimmer, R. Hamann and J. Hanks 2007. 'The UN Global Compact in sub-Sahara Africa: decentralization and effectiveness', *Journal of Corporate Citizenship* 7: 99–112.

Ruggie, J. G. 2004. 'Reconstituting the global public domain: issues, actors, practices', *European Journal of International Relations* 10: 499–541.

Thynne, I. 2008. 'Climate change, governance and environmental services: institutional perspectives, issues and challenges', *Public Administration and Development* 28: 327–339.

UNFCCC 2007. *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries*. Bonn: Climate Change Secretariat. http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/txt/pub_07_impacts.pdf.

World Bank 2006. *Clean Energy and Development: Towards an Investment Framework*. Washington, DC: World Bank.

Zelli, F. 2007. 'The World Trade Organization: free trade and its environmental impacts', in K. V. Thai, D. Rahm and J. D. Coggburn (eds.), *Handbook of Globalization and the Environment*. London: Taylor and Francis, pp. 177–216.