Climate Change as a Threat Multiplier for Human Disaster and Conflict

Policy and Governance Recommendations for Advancing Climate Security

Patrick Huntjens and Katharina Nachbar

Abstract

Climate change and its effects are inextricably linked to complex questions of security. These—collectively termed climate security—have in turn been subject to an increasingly broad debate in both the scientific and the policy community. After a series of focused discussions, the United Nations Security Council (UNSC) lifted the issue to the highest level of political discourse on international peace and security. Relatedly, several governments—the United States, India, Germany, and the United Kingdom—now identify climate change as a national security challenge.

Despite this increase in attention, the ways in which the effects of global warming will affect security at various levels are still far from clear. In this paper, we first examine state-of-the art research and thinking on the implications of climate change for security and then identify the key governance challenges the international system faces. We explore potential pathways for reform, both to make multilevel climate governance more fit for purpose, and to better anticipate and address the predicted security implications of climate change. Specifically, we pose two research questions:

1. What are the key policy and (multilevel) governance challenges at the intersection of climate change and security?

2. How can current policies and governance arrangements (at different levels) be improved to better meet these challenges?

Narrow conceptions of climate change as a threat to state security legitimize certain political measures more than broader notions of security would, for example, the security of people as well as of states. In this paper, we address two broad categories of security: national and international (the security of states) and human (the security of people).

In the final section, we discuss the following key policy implications and governance reform recommendations:

- integrating climate action and international peacebuilding efforts

- building adaptive capacity at multiple levels to advance climate security (including climate-related human security issues)

- developing a conflict-sensitive approach to climate change mitigation and adaptation for preventing inter- and intrastate conflicts

- establishing plans for multilevel and multi-stakeholder climate governance

- developing institutional design propositions for climate governance at multiple levels

The Hague Institute for Global Justice

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About the Authors

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1   Introduction

1.1   Background

The 2011 UNDP Human Development Report and annual IPCC reports provide overwhelming evidence that we are reaching an upper limit to our capacity to emit greenhouse gases (GHGs) without dire consequences.[1] Stabilizing greenhouse gas concentrations in the atmosphere at a level that prevents catastrophic climate change will require an estimated 40 to 70 percent reduction in anthropogenic long-lived GHGs by 2050 from 2010 levels to keep CO_2 from exceeding 450ppm by 2100, and global zero emissions from 2100 onward.[2]

Climate change has often been called the single biggest challenge for humanity over the coming centuries. Given the scale of the problem, its impacts on human life on earth, and the level of coordinated action required to solve it, this statement seems only adequate. After the Intergovernmental Panel for Climate Change (IPCC) published its first assessment report in 1990, it was accused of dramatizing the anthropogenic (man-made) causes as well as the potential effects of global warming; now we know that the researchers had in fact underestimated both causes and effects. Although uncertainty and unpredictability remain, the scientific basis of climate change is now well established. It suggests that change is happening more quickly than previously estimated and no longer can be framed as a distant threat.[3] The past three decades have likely been the warmest thirty years of the last fourteen hundred.[4] The atmospheric concentration of greenhouse gases has increased to a level unprecedented in the last eight hundred thousand years, and their "mean rates of increase" over the past century "are, with very high confidence, unprecedented in the last 22,000 years."[5] Changing precipitation patterns, melting ice caps, rising sea levels, acidification of oceans, and heightened climatic variability are only some of the predictable consequences of a climate destabilized by warming atmosphere and oceans.

The magnitude and acceleration of adverse climate change in the last twenty years testify to the inadequacy of international efforts to address, let alone halt or reverse, these trends. GHG emissions continue to rise and a binding successor agreement to the 1997 Kyoto Protocol, itself only marginally implemented, appears to remain out of reach to many observers. Yet as the 2015 Paris Conference of the Parties (COP) approaches, the ever-growing body of research on the science of climate change and its likely economic, political, and social implications gives rise to a heightened sense of urgency for countervailing action.

Such action entails some combination of *mitigation* (reducing GHG emissions) and *adaptation* (coping with impacts already unavoidable). The EU's recently agreed-on climate change legislation sets concrete measures to reduce EU emissions to 20 percent below 1990 levels by 2020 and may be increased to 30 percent as part of an international agreement in

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1 UNDP, Sustainability and Equity: A Better Future for All (New York: Palgrave Macmillan, 2011); IPCC, Climate Change 2014: Impacts, Adaptation, and Vulnerability, Working Group II, 5th Assessment Report (Cambridge: Cambridge University Press, 2014).
2 IPCC, Climate Change 2014.
3 See, for example, Nicholas Stern, "The Structure of Economic Modeling of the Potential Impacts of Climate Change," Journal of Economic Literature 51, no. 3 (2013): 838–59; IPCC, Climate Change 2014.
4 https://www2.ucar.edu/climate/faq/how-much-has-global-temperature-risen-last-100-years
5 IPCC, Climate Change 2013: The Physical Science Basis (Cambridge: Cambridge University Press, 2013), 11.

which other developed countries agree to comparable reductions. Because long-lasting GHGs such as carbon dioxide (CO_2) remain in the atmosphere for centuries, capping and reducing such emissions will help keep climate change from worsening. However, alleviating its effects in less time will require reductions in emissions of GHGs such as methane and hydrofluorocarbons whose atmospheric concentrations fall more rapidly and—pound for pound—are thirty times more potent heat-trapping substances than CO_2.[6]

1.2   Key Research Questions and Definitions

Climate change and its effects are inextricably linked to complex questions of security. Climate security—as these questions are collectively termed—has been subject to an increasingly broad debate in the scientific as well as the policy community. Despite this increase in attention, the ways in which global warming will affect security at various levels are still far from clear. In this paper, we examine the research and thinking on the implications of climate change for security, and identify the key resulting governance challenges the international system faces. The paper explores potential pathways for reform to make multilevel climate governance more fit for purpose, and to better anticipate and address the predicted security implications of climate change. Specifically, we pose two broad research questions:

1   What are the key policy and (multilevel) governance challenges at the intersection of climate change and security?
2   How can current policies and governance arrangements (at different levels) be improved so as to better meet these challenges?

Security means different things to different groups and individuals and the potential implications of climate change for security are varied and complex. We therefore define the terms as we use them in this paper.

Human security as a concept aims to capture the broad range of factors that determine people's livelihoods and their ability to exercise their human rights and fulfill their potential. The UNDP's 1994 Human Development Report definition argues that the scope of global security should be expanded to include threats in seven areas: economic, food, health, environmental, personal, community and political security.[7]

Climate change is understood as a threat to human security in that it disrupts individuals' and communities' capacity to adapt to changing conditions, usually by multiplying existing or creating new strains on human livelihoods.[8]

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6 Global Commission on the Economy and Climate, Better Growth Better Climate (Washington, DC: World Resources Institute, September 2014), 152.
7 United Nations Development Programme, Sustainability and Equity: A Better Future for All (Oxford: Oxford University Press, 1994).
8 For a discussion of the climate and human security discourse, see Hans Günter Brauch and Jürgen Scheffran, "Introduction," in Climate Change, Human Security and Violent Conflict, ed. Jürgen Scheffran et al. (Heidelberg: Springer, 2012); Jon Barnett and Neil Adger, "Climate Change, Human Security and Violent Conflict," Political Geography 26 (2007): 639–55; Matt McDonald, "Discourses of Climate Security," Political Geography 33, no. 1 (2013): 42–51; Angela Oels, "From 'Securitization of Climate Change to 'Climatization' of the Security Field," in Climate Change, Human Security and Violent Conflict.

2   Climate Change and Security: Examining Possible Links at Multiple Levels

As the scientific evidence has hardened, climate change has increasingly been framed as a security concern. The United Nations Security Council (UNSC) has held a number of debates on the potential security implications of climate change, lifting the issue to the highest level of political discourse on matters of international peace and security. Various governments—such as the United States (US), Germany, and the United Kingdom (UK)—have identified climate change as a national security challenge.[9] Although it seems intuitive to link security to climate change impacts like extreme weather events or resource scarcity, in reality, many different and even conflicting notions and dimensions of security coexist. The climate change–security nexus has been conceptualized in various ways by a variety of actors, entailing different sets of assumptions about who is to be secured and from what threats.[10] This is important because, depending on the logic used to establish such a link, concrete policy decisions and responses flowing from that logic may differ substantially.

Narrow conceptions of climate change as a threat to state security legitimize certain political measures more than broader notions of security would (the security of people as well as states). In the following section, we address two categories: national and international security (the security of states), and human security (the security of people).

2.1   Climate Change and State Security

For the nation-state as the central provider of security, the security threats that climate change poses are regarded primarily as threats to the state and its functions: its institutional capacity, territorial integrity and, ultimately, national sovereignty. Addressing climate change is thus seen as a vital component of state security agendas. One can distinguish, however, between *direct* and *indirect* implications.

The most direct and visible effect would be rising sea levels and storm surges that threaten the existence of Small Island Developing States (SIDS). Although SIDS are and will be most heavily affected by rising sea levels, many low-lying states or their coastal or deltaic regions are likely to face similar threats. Many of the world's major port cities and economic hubs are located in such regions and rising sea levels threaten critical economic infrastructure. If energy production or distribution facilities are damaged or destroyed by floods or other effects of rising sea levels and storm activity, the state's capacity to provide its own economic and potentially military security decreases. As Byravan and Rajan have argued, "for the tens to hundreds of millions of people living in low-lying areas or on small islands, no physical defense is realistically possible or can be fully protective."[11] For such states, climate change mitigation is about nothing less than the survival of their societies as they currently exist.

The most prominent indirect security implication of climate change is the notion of climate change as a *threat multiplier* and driver of violent conflict. With respect to state security, one aspect of this is the potential for confrontation and conflict, a sort of "geopolitical rush" over resources made accessible as a result of climatic change.[12]

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9 McDonald, "Discourses of Climate Security," 42.
10 Ibid., 43.
11 Byravan S, Rajan S. "Providing new homes for climate change exiles," 240.
12 Kathrin Keil, "The Arctic: A New Region of Conflict?" Cooperation and Conflict 49, no. 2 (2014): 162.

In the Arctic region, melting ice caps are one of the most troubling effects of global warming. The last few summers—2012, 2013, and 2014—have seen the lowest ice coverage since the inception of systematic measurement thirty-five years ago.[13] If Arctic summer sea ice and Northern Hemisphere spring snow cover continue to recede at current rates, it is highly likely that ice-free Arctic summers will become a reality over the next few decades.[14] An outcome of this trend will be access to what is anticipated to be vast and so far unexplored stores of hydrocarbons, leading to growing international attention to the potential for exploitation, not only by Arctic littoral states but others farther away, such as China or the European Union.[15] A neorealist line of thinking considers it apparent that the melting ice will lead to competition and conflict over resource reserves, particularly those of oil and gas.[16] The quest for energy security turns into a hard security issue in a region with underdeveloped or ineffective governance structures.[17]

States with an interest in exploiting the Arctic's resources face a range of physical challenges, however, and existing institutional arrangements such as the Arctic Council have a track record of leading to cooperation between the Arctic countries.[18] Nonetheless, the potential security implications of newly accessible Arctic resources have attracted much attention from political and economic actors alike.

The other, and more dominant, hypothesis is that climate change will lead to new or more intense resource scarcities, which in turn will trigger more intense competition and conflict between and within states sharing resources. Proponents of this concept have argued that climate change is likely to reinforce existing vulnerabilities and threats to stability and thus be an indirect impetus to conflict. Climate change may exacerbate existing or create new socioeconomic stresses such as loss of arable land, resource scarcities, and weakening institutions, that may in turn make a violent escalation between or within states more likely.[19]

For example, several UN reports show that from 2006 to 2011, 60 percent of Syria had to deal with the worst prolonged drought and the heaviest crop failures for thousands of years.[20] Because of it, many Syrians faced extreme food insecurity. According to a 2011 UN report,

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13 Ibid.
14 IPCC, Climate Change 2014; Keil, "The Arctic."
15 These are Russia, the United States, Canada, Norway, Denmark and Greenland, Iceland, Finland, and Sweden.
16 See, for example, Hans Gerhardt et al., "Contested Sovereignty in a Changing Artic," Annals of the Association of American Geographers 100, no. 4 (2010): 992–1002; Scott Borgerson, "Arctic Meltdown," Foreign Affairs 87, no. 2 (2008): 63–77.
17 Keil, "The Arctic."
18 The physical challenges include a need for considerable initial investments in infrastructure and state-of-the-art technology as well as regulatory challenges and potentially higher insurance rates; see Keil, "The Arctic." See also Oran R. Young, Creating Regimes: Arctic Accords and International Governance (Ithaca, NY: Cornell University Press, 1998); Njord Wegge, "The Political Order in the Arctic: Power Structures, Regimes and Influence," Polar Record 47, no. 2 (2011): 1–12; Keil, "The Arctic."
19 Thomas F. Homer-Dixon, Environment, Scarcity, and Violence (Princeton, NJ: Princeton University Press, 1999); Maria J. Trombetta, "Climate Change and the Environmental Conflict Discourse," in Climate Change, Human Security and Violent Conflict.
20 Wadid Erian, Bassem Katlan, and Ouldbdey Babah, "Drought vulnerability in the Arab region: Special case study: Syria," Damascus: Global Assessment Report on Disaster Risk Reduction, 2011; Clemens Breisinger et al., "Global and Local Economic Impacts of Climate Change in Syria and Options for Adaptation," IFPRI Discussion Paper no. 01091 (Washington, DC: International Food Policy Research Institute, June 2011). Colin Kelley and his colleagues provide evidence that climate change caused the Syrian drought between 2006 and 2011, which in turn contributed to the conflict in Syria. It was the worst drought in the instrumental record, causing widespread crop failure and a mass migration of farming families to urban centers. "Climate Change in the Fertile Crescent and Implications of the Recent Syrian Drought," Proceedings of the National Academy of Sciences 112, no. 11 (2015): 3241–46.

this left two to three million people living in extreme poverty, pressured farmers to relocate to Syrian cities, and left youth more susceptible to joining extremist groups. The first protests against the Syrian government in early 2011 evolved into the current civil war and has had huge regional consequences.

As key resources such as water or arable land become more scarce because of climate change, states may take certain measures to address the scarcities. However, if such adaptation measures are uncoordinated and largely insensitive to or unaware of potential negative externalities beyond a state's borders, they can become a source of interstate conflict if one state's behavior is perceived by other states as a threat to their national security interests. An obvious example is the issue of shared transboundary waters such as river basins or deltaic regions. If an upstream riparian state decides to implement a major dam project to mitigate the adverse effects of diminishing water supply, downstream states may face even more severe shortages. An example is Central Asia, where tensions between the states of the region have increased as a result of mounting water pressure.[21] Other examples include the Nile, Euphrates-Tigris, Jordan, Ganges-Brahmaputra, and Mekong river basins. Effective water and climate diplomacy requires assurance that shared water resources are managed efficiently, sustainably, and equitably.

The notion that climate change will have direct and indirect implications for state security, be it through conflicts caused by scarcities or competition over newly accessible resources, has increased interest in climate change among national security actors that have long treated it as a low-priority issue. This interest has grown along with a shift in the scientific consensus, away from early linear climate models to those that allow for the possibility of abrupt changes and extreme events.[22] In response, research institutions and think tanks in a range of European countries, India, and the United States have published reports offering scenarios that depict how climatic and environmental change may threaten state security and national interests.[23] Most of these scenarios have framed climate change as a threat multiplier that will exacerbate existing conflict drivers, particularly in fragile states where institutions are weak and governance is poor.[24] Military actors around the world have begun to grapple with the specific challenges that climate change will pose for the defense sector, and to factor such considerations into their military planning.[25] Tellingly, the US government's most recent national intelligence strategy identifies climate change and the potential instability resulting from its impacts as one of the major threats to the United States in the decades to come.[26] Driven by these analyses, the UN Security Council has debated the potential impacts of climate change on the maintenance of international peace and security in two special sessions,

21 International Crisis Group, "Water Pressure in Central Asia," Europe and Central Asia Report no. 233 (Brussels: International Crisis Group, September 11, 2014), i–ii.
22 Trombetta, "Climate Change."
23 Examples for this are a 2007 report compiled by the Swedish Defence Research Agency on The Geopolitics of Climate Change, a 2008 report prepared for the German government by the German Advisory Council on Global Change entitled Climate Change as a Security Risk, as well as several studies commissioned by the American and British defense communities, usually to think tanks or policy-oriented research institutions such as the US Center for Naval Analyses or the British Royal United Services Institute. Many of these studies develop multiple scenarios as to the causal chains that may link climate change and instability, often with a focus on violent conflict, military infrastructure, preparedness and planning. See also Trombetta, "Climate Change"; Academic Foundation, Security Implications of Climate Change for India, report of the Institute for Defence Studies and Analyses Working Group (New Delhi: Academic Foundation, 2009).
24 Oli Brown, Anne Hammill, and Robert McLeman, "Climate Change as the 'New' Security Threat: Implications for Africa," International Affairs 83, no. 6 (2007): 1143.
25 Worldwide, 110 militaries have identified climate change as a national security threat. See Andrew Holland and Xander Vagg, "The Global Security Defense Index on Climate Change" (Washington, DC: American Security Project, 2013)
26 Shane Harris, "Water Wars," Foreign Policy, September 18, 2014, http://foreignpolicy.com/2014/09/18/water-wars/.

in 2007 and 2011. Another Arria Formula meeting, "The Security Dimensions of Climate Change," co-chaired by the UK and Pakistan, was held in February 2013.[27] Although these discussions have not led to any concrete decisions, they illustrate that, as our understanding of its potential implications for state and international security has grown, climate change has moved from the periphery of global concerns to the center of attention.

This securitization of the climate debate has also triggered concerns among scholars as well as within the global policy community. Paramount is the fear that conceptualizations of climate change as a "new" threat to global stability and national security may lead states to resort to "old" responses that are defensive and isolationist rather than collaborative. Debates in the Security Council have ended in controversy precisely because some states, jointly with the academic community and civil society organizations, are worried that an international discourse focused on the security of the state and the maintenance of the international status quo may present those most vulnerable to climate change as threats rather than populations in need of protection.[28] In line with the Copenhagen School's securitization theory, defining something as a threat to state security inevitably produces a need for "exceptional measures and a set of practices legitimated by the logic of survival."[29] In other words, defining something as a nail automatically makes reaching for a hammer more likely. Such a response to climate change is potentially and especially problematic because climate change cannot be mitigated or averted by any one state, let alone militarily. Those suspicious of the increased attention by security actors to climate change fear that the securitization discourse—given its overly simplistic assumptions about environmental change, resource competition, and conflict—will soon come to dominate the international agenda, thereby pushing other, more collaborative approaches to the periphery.[30]

2.2   New Climate Constituencies

Although references to climate change in national security strategies and defense planning documents have certainly increased, little evidence so far suggests that a securitization of climate change has led to the kind of unilateral defensive action that many have warned of. In fact, most strategic documents that have established a link between climate change and state security have also emphasized the need for disaster preparedness and measures aimed at building resilience in countries at risk of climate-induced conflict.[31]

Other scholars have argued that any spotlight directed at climate change as the ultimate threat to humanity is preferable over a continuation of ignorance and inaction. Some have even spoken of a climatization of the security sector, that is, transforming existing security practices to climate policy and introducing new ideas and practices to traditional security policy.[32] From such a perspective, "new" climate constituencies from the realm of traditional security may not only hold risks, but also offer opportunities. For example, the defense and intelligence communities may be best equipped to predict or manage climate-induced

27 The Arria Formula is an informal arrangement that allows the UN Security Council greater flexibility to be briefed about international peace and security issues. It has been used frequently and assumed growing importance since it was first implemented in March 1992. What's In Blue, "Arria Formula Meeting on Climate Change," February 14, 2013.
28 McDonald, "Discourses of Climate Security."
29 One of the most prominent figures of the Copenhagen School is Ole Wæver. See, for example, Wæver, "Securitization and Desecuritization," in On Security, ed. Ronnie Lipschut, 46–88 (New York: Columbia University Press, 1995); Trombetta, "Climate Change."
30 Trombetta, "Climate Change."
31 Michael Brzoska, "Climate Change as a Driver of Security Policy," in Climate Change, Human Security and Violent Conflict, 175.
32 Angela Oels, "From 'Securitization of Climate Change to 'Climatization' of the Security Field: Comparing Three Theoretical Perspectives," in Climate Change, Human Security and Violent Conflict, 185.

disasters in a way that enables the international community to prevent large-scale conflict. Moreover, the kind of high-level political attention signified by the UN Security Council debates held on the issue may help mobilize the necessary national and international political will for more forceful international action on climate change mitigation and adaptation.[33] Ultimately, "the threat of climate change is posed to both people and states as components of a broader conception of international society."[34] Although framing climate change as a threat to states and global order has become more prevalent, no trend toward greater militarization of climate action is evident. Broader conceptions of climate security as human security have prevailed.

2.3   Protecting the Most Vulnerable: A Human Security Lens

Agreement is strong in both academic and policy communities that climate change will most heavily affect those least able to adapt to it. Climate insecurity is seen as closely tied to vulnerability and resilience, which are themselves functions of exposure to hazards, institutional capacity, availability of alternative livelihoods, and various other factors. These may each greatly vary within states and across social strata. Although climate change is predicted to most heavily affect the Global South, climate insecurity will certainly not be confined to arbitrary distinctions such as between North and South, or between developed and developing countries. As climate change interferes with present ways of life across the world, the security of individuals and communities (as opposed to that of states and the international system) has shifted to the center. This is in line with an overall reconceptualization of security as human rather than territorial or state, as the UN Development Programme (UNDP) first articulated in its 1994 Human Development Report.[35] The term *human security* emerged in after the Cold War as a way to link various humanitarian, economic, and social issues to better alleviate human suffering and assure security. The issues human security addresses include, but are not limited to,

- organized crime and criminal violence,
- human rights and good governance,
- armed conflict and intervention,
- genocide and mass crimes,
- health and development, and
- resources and environment.

Human security as a concept aims to capture the broad range of factors that determine people's livelihoods and their ability to exercise their human rights and fulfill their potential. Climate change is understood as a threat to human security in that it disrupts the capacity of both individuals and communities to adapt to changing conditions, usually by multiplying existing or creating new strains on human livelihoods.[36] The diverse ways of interaction between a warming climate and the socioeconomic variables on which human livelihoods depend render predictions on the impact of climate change on human security highly complex. Nonetheless, in an attempt to induce more rigorous scientific research on this issue,

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33 Ibid., 201.
34 McDonald, "Discourses of Climate Security," 48.
35 UNDP, New Dimensions of Human Security (New York: Oxford University Press, 1994).
36 For a discussion of the climate and human security discourse, see, for example, Hans Günter Brauch and Jürgen Scheffran, "Introduction: Climate Change, Human Security, and Violent Conflict in the Anthropocene," in Climate Change, Human Security and Violent Conflict; Barnett and Adger, "Climate Change, Human Security"; McDonald, "Discourses of Climate Security"; or Oels, "From 'Securitization.'"

the IPCC's Fifth Assessment Report has for the first time devoted an entire section to the linkages between climate change and human security.[37]

2.4   Climate Change, Human Insecurity, and Social Conflict

As noted earlier, little systematic evidence backs up one-dimensional scenarios of a future dominated by climate conflicts, that is, conflicts directly caused by climate change impacts such as extreme weather events or diminishing resources. Scholars have quantitatively measured the direct correlation between climatic and resulting environmental change on the one hand, and armed conflict or organized violence on the other, but results have been mixed.[38] Given this lack of evidence, and the complexity of how human systems interact with natural ones, the view that climate change will most likely magnify existing socioeconomic stresses and thereby threaten human security has gained the greatest traction among both academics and policymakers.[39] Awareness is growing that "climate change is more likely to lead to small-scale communal violence," in most cases without the direct involvement of the state.[40] From this perspective, shifts in climatic conditions may contribute to the risk of violent intrastate conflict by eroding the conditions on which livelihoods depend, especially in states with little institutional capacity to adequately respond to such changes. Violence is not a necessary outcome of such processes, many of which are gradual rather than abrupt, but it is a possibility.[41]

Contemporary intrastate conflicts are overwhelmingly in developing countries, many of which are also under significant environmental stress and acutely exposed and vulnerable to climate-induced hazards. As climate change disrupts the conditions for sustaining traditional ways of life, poverty and marginalization may both hinder adaptation and heighten relative deprivation as resources become more scarce. How diminishing resources are redistributed among communities may be determined by existing power structures and political influence within a society. Socioeconomic marginalization or discrimination based on group membership may thus be equally important in determining vulnerability to climate change as the environmental changes themselves. Structural inadequacies or a lack of institutional provisions to alleviate negative impacts, such as increased inequality and relative deprivation, seems equally important. If the potential effects of climate change on livelihoods are not addressed, such as by establishing an adequate social safety net or facilitating alternative ways of life, an escalation in violent conflict may well be the outcome.[42]

Some of the negative impacts are relatively straightforward. It is not difficult to imagine how land degradation, chronic droughts, and repeated crop failure will erode agricultural production and threaten livelihoods. Secondary effects may be equally important drivers of social conflict, however. Infectious disease resulting from malnutrition or water shortage may be less visible but would be an equally powerful determinant of poverty, socioeconomic exclusion, and—ultimately—conflict.[43]

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37 IPCC, Climate Change 2014.
38 See, for example, Halvard Buhaug and Ole Magnus Theisen, "On Environmental Change and Armed Conflict," in Climate Change, Human Security and Violent Conflict.
39 Dennis Tänzler, Alexander Carius, and Achim Maas, The Need for Conflict-Sensitive Adaptation to Climate Change (Berlin: Adelphi, 2013).
40 Jürgen Scheffran, Tobias Ide, and Janpeter Schilling, "Violent Climate or Climate of Violence? Concepts and Relations with Focus on Kenya and Sudan," International Journal of Human Rights 18, no. 3 (2014): 372.
41 Barnett and Adger, "Climate Change, Human Security."
42 Ibid.
43 Aaron Sayne, "Climate Change Adaptation and Conflict in Nigeria" (Washington, DC: United States Institute of Peace, June 2011); Trombetta, "Climate Change."

The IPCC's fifth assessment report clearly demonstrates that climate change will affect water security and is likely to cause more tensions related to access to water, food security, and energy supplies (hydropower). The main impacts will be related to changes in precipitation patterns. The tendency is for the dry regions to become dryer and wet regions to become even wetter. Both the EU Council and the US intelligence community have noted that tensions and conflicts over access to water are likely to become more frequent in the coming ten years and could endanger international peace and security.[44] Recent research shows little evidence for an increase in interstate water conflicts but a growing risk of subnational conflicts among water users, regions, ethnic groups, and competing economic interests.[45] Data from the Water Conflict Chronology show these intrastate conflicts to be a larger and growing component of all water disputes. In addition, traditional international mechanisms for addressing them, such as bilateral or multilateral treaties, are not as effective.[46]

2.4.1 Climate-induced migration

Natural disasters have become a primary cause of forced migration, and the effects of climate change are expected to intensify such disasters and accelerate displacement rates in upcoming decades. The number of storms, droughts, and floods has increased threefold over the last thirty years and the effects on vulnerable communities have been devastating, particularly in the developing world. Over the past five years, an average of nearly twenty-seven million people have been displaced annually by natural hazard-related disasters.[47]

The links between climate change and migration are usually far from simple and direct. Although gradual and sudden environmental changes are already resulting in substantial population movements, climate-specific factors are often difficult to isolate from other environmental challenges. It is therefore important to look at a broader migration and environment nexus. Other factors, such as conflict, governance and levels of development, also play important roles.

Climate change–induced migrations clearly pose new challenges to the international system, from an increase in irregular migration, to strains on existing asylum systems, to protection gaps for certain migrants affected.[48] Yet the related legal and normative framework and institutional roles and responsibilities remain poorly developed.[49]

The complexity of climate-induced migration is well illustrated by Small Island Developing States (SIDS). As SIDS populations face increasing hardship due to natural disasters and other climate change impacts, which undermine development gains and well-being, and as territories are submerged or otherwise rendered uninhabitable, the movement of people is inevitable.

Also in the EU, the debate on environmental migration is intensifying, especially in light of the dramatic consequences and enormous number of fatalities among boat refugees in the Mediterranean. The debate on climate-induced migration has been considered a way to

44 Council of the European Union, "Council Conclusions on EU water diplomacy," Foreign Affairs Council meeting, Brussels, July 22, 2013; Defense Intelligence Agency, "Intelligence Community Assessment on Global Water Security," ICA 2012-08 (Washington, DC: US Department of State, February 2, 2012).
45 Pacific Institute, "The Water Conflict Chronology and Database," The Pacific Institute, 2015.
46 Ibid.
47 Internal Displacement Monitoring Centre (IDMC), "Global Estimates: People Displaced by Disasters" (Geneva: IDMC, September 2014).
48 Susan Martin, "Climate Change, Migration, and Adaptation" (Washington, DC: German Marshall Fund of the United States, June 2010).
49 Ibid.

promote environmental actions and new forms of governance of migration inspired by solidarity and human security.[50] The development of such forms of governance would be quite relevant, given the role of the EU in both migration and environmental policy and its emphasis on nontraditional instruments to ensure security. At the same time, critics have warned about the problems associated with framing climate-induced migration, and migration more generally, as security issues.[51] Appeals to security are likely to reinforce the notion of "fortress Europe" and a negative conceptualization of migration.[52]

2.5   Climate Change Adaptation and the Risks of Maladaptation

Mitigation efforts remain central to the long term, but a certain degree of global warming and its consequences are already irreversible. It is thus not surprising that adaptation efforts have also become a core concern in international climate negotiations. If certain impacts can no longer be averted, communities need to be equipped to cope with them by lowering their vulnerability and increasing their capacity to develop alternative personal livelihoods. In the context of security, successful adaptation may even serve as a conflict prevention measure by minimizing destructive social disruption and beginning positive transformation processes instead.[53] In a human security context, climate change adaptation in many respects overlaps with more traditional development practices, which are usually also aimed at building community resilience in the face of environmental and socioeconomic stresses.

Climate change adaptation has long been treated as a technical challenge, related to concepts such as technology transfer, knowledge sharing, or skills training (crop rotation or reforestation practices, for example).[54] Only recently, the potential negative effects of misguided adaptation efforts have received greater attention. That "adaptation measures raise not only technical and financial questions, but political questions as well, especially when such measures are implemented in fragile states" has become increasingly clear.[55] Adaptation programs are at best a way to effectively reduce human insecurity: they may also threaten human security if they are designed and implemented without sensitivity to the socioeconomic context. If adaptation measures have negative unintended consequences, they may contribute to instability, social tensions, and even conflict.[56] This is true even for relatively peaceful societies, but the risks are likely to be greatly magnified in social conflict, whether recent or ongoing. If the social and political contexts of adaptation are poorly understood or ignored, adaptation measures and funding may trigger resistance and social competition. Such contention is not restricted to fragile and conflict-affected states, of course, but peaceful mitigation is disproportionately more challenging. A sense of disproportionate benefits and of exclusion may sow mistrust between communities and lead to an erosion of established social structures. Because of the increasingly blurry lines between climate change

50 Andrew Geddes and William Somerville, "Migration and Environmental Change in International Governance: The Case of the European Union," Environment and Planning C: Government and Policy 30, no. 6 (2012): 1015–28.

51 Jef Huysmans, The Politics of Insecurity: Fear, Migration and Asylum in the EU (Abingdon: Routledge, 2006); Betsy Hartmann, "Rethinking Climate Refugees and Climate Conflict: Rhetoric, Reality and the Politics of Policy Discourse," Journal of International Development 22, no. 2 (2010): 233–46.

52 Trombetta, "Climate Change."

53 Scheffran, Ide, and Schilling, "Violent Climate," 376.

54 Tänzler, Carius, and Achim Maas, The Need for Conflict-Sensitive.

55 Ibid., 6.

56 For a discussion of several examples for such maladaptation, see Philipp Babcicky, "A Conflict-Sensitive Approach to Climate Change Adaptation," Peace Review: A Journal of Social Justice 25, no. 4 (2013): 480–88.

adaptation and development assistance, a number of scholars have pointed out that the "do no harm" principle formulated to prevent unintended negative consequences of development programs is equally applicable to climate adaptation projects.[57] Climate change agencies and practitioners are still at the beginning of exploring what works in climate change adaptation and what does not. Although the lesson that complex sociopolitical dynamics cannot be ignored when designing and implementing adaptation programs has already been learned, how adaptation may serve as a stepping stone toward human security rather than a driver of instability remains poorly understood.

2.6   Integrating Climate Action and International Peacebuilding Efforts

If we accept that notion that climate change will act as a threat multiplier, that is, exacerbate existing socioeconomic stress factors in societies with high exposure, high levels of poverty, and little institutional capacity to mitigate or adapt to climate change, it seems logical that successful mitigation and adaptation strategies will have to be a critical component of future peacebuilding work. However, almost no efforts have been made so far to integrate the realms of climate action and peacebuilding.[58] This is even more surprising given that many of the countries currently predicted to be most heavily affected by the adverse effects of global warming are also at the top of the list to receive international peacebuilding support. The reconceptualization of security as human rather than state security was a key driver of the more integrated approach that has become the norm in international peacebuilding work. Despite the significant overlap between climate action and development work, especially at the subnational level, the climate dimension has not yet been incorporated into development initiatives. Despite the obvious appeal of the integration model, volatile funding cycles have meant that peacebuilding missions are already overburdened. Nonetheless, recent insights on climate change as a human security threat and the rapid pace of climatic change in general, suggest benefits to moving beyond this compartmentalization. In the future, consolidating peace after conflict may well require peacebuilding actors to factor in climate change induced developments and thus benefit from greater cooperation between the two sectors.[59]

2.7   Multilevel Governance Challenges

Most specialists agree that states face many institutional inadequacies when mitigating or adapting to climate change impacts and that new governance mechanisms are needed to improve climate governance at multiple levels. The concept of multilevel governance is an effort to collectively solve public problems by involving a series of relevant actors from the local to the global level, such as institutions, states, civil society, and business. Governance challenges, whatever countries' institutional settings and context, are significant and critical.

The term *multilevel* governance is used to characterize the relationship between public actors situated at different administrative and territorial levels. This creates layers of actors who interact with each other: (1) across different levels of government (vertical coordination); (2) among relevant actors at the same level (horizontal coordination at central or at subnational

57 Tänzler, Carius, and Achim Maas, The Need for Conflict-Sensitive; ibid.
58 Richard Matthew, "Integrating Climate Change into Peacebuilding," Climatic Change 123, no. 1 (2014): 83–93.
59 They are starting to do so. See UNEP, "From Conflict to Peacebuilding: The Role of Natural Resources and the Environment" (Nairobi: UNEP, 2009); see also USAID, "Technical Publications on Conflict Management and Mitigation," 2015, at http://www.usaid.gov/what-we-do/working-crises-and-conflict/technical-publications; Matthew, "Integrating Climate Change."

level); or (3) on a networked basis. This relationship exists regardless of constitutional system (federal or unitary) and affects the implementation of public policy.[60]

Debates over scaling powers within multilevel governance have become widely discussed in several related academic subdisciplines, including economic federalism, political geography, EU studies, and international public policy.[61] For example, conflicts over the appropriate scale or institutional level of policymaking characterize multilevel governance.[62]

Under certain circumstances, experience gained and solutions found at one level of a certain scale might be appropriate to solve a problem at either a higher or a lower level of that scale. Thus scaling is a concern when searching for solutions to multiscale and multilevel systems such as linked social-ecological systems. On the other hand, caution in transferring institutional arrangements is critical because an arrangement that fit one setting of a problem might not be suitable on another level or scale.[63]

Within this paper, we propose several recommendations for addressing multilevel governance challenges for climate governance, including integration of important bottom-up processes of learning with top-down policy strategies, vertical integration across levels, horizontal integration across policies, and adaptive or polycentric governance.

2.8   Institutional Design for Climate Governance

As climate action is operationalized, considerations and local perceptions of justice must be taken into account in designing mitigation and adaptation programs. Social justice in climate action also means inclusiveness: those who are supposed to benefit from climate action must be included in the decision-making process to ensure that mitigation and adaptation measures do not reinforce existing perceptions of injustice or produce new tensions. For this reason, vulnerability and risk assessments are needed to avoid *mal-adaptation*, given that adaptation actions might well increase vulnerability rather than reduce it. Some examples are sea level rise or flood protection infrastructure that disturb the natural dynamic nature of coastal and river systems, or cooling or water supply technologies that increase energy consumption. Interventions can shift the distribution of benefits or involuntary risks from one group to another.[64] Adaptation may even exacerbate injustice, such as when actions in the logic of protecting national assets and interests render some disadvantaged groups even more vulnerable. Hence, a better understanding is required of the underlying processes of climate change adaptation pertaining to trust building, conflict resolution, and pursuits of social justice among vulnerable parties.

If under present conditions climate variability is already important to successful management of water and natural resources in many parts of the world in that it drives processes of local,

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60 Huntjens, Patrick. "Water management and water governance in a changing climate: Experience and insights on climate change adaptation in Europe, Africa, Asia and Australia." Eburon Academic Publishers, 2010

61 On federalism, see, for example, Wallace Oates, "Environmental Policy in the European Community: Harmonization or National Standards?" Empirica 25, no. 1 (1998): 1–13; on political geography, see David Delaney and Helga Leitner, "The Political Construction of Scale," Political Geography 16, no. 2 (1997): 93–97; on EU studies, see Liesbet Hooghe and Gary Marks, "Unraveling the Central State, but How? Types of Multi-level Governance," American Political Science Review 97, no. 2 (May 2003): 233–43; on international public policy, see Young, Creating Regimes.

62 Young, Creating Regimes.

63 Ibid., 10.

64 Louis Lebel et al., "Adaptation to Climate Change and Social Justice: Challenges for Flood and Disaster Management in Thailand," in Climate Change Adaptation in the Water Sector, ed. Fulco Ludwig, Pavel Kabat, Henk van Schaik, and Michael van der Valk, 125–41 (London: Earthscan, 2009).

national, and regional adaptation, then climate change adds to the existing complexities of achieving just socioeconomic development that involves multiple uses of water among growing numbers of users in fair and sustainable ways.[65] Proactive integration of climate change adaptation, disaster risk reduction, and sustainable development strategies is often needed. However, we know as yet little about the politics of how strategies actually work, whether in regard to trust building, conflict resolution, how which different interests are weighed against each other, or some other way.

Patrick Huntjens and his colleagues provide an evidence-based contribution to understanding processes of climate change adaptation in the Netherlands, Australia, and South Africa that builds on the work of Nobel Prize Winner Elinor Ostrom on institutional design principles for local common pool resources systems. [66] In dealing with complexities and uncertainties related to the impacts of climate change, the authors argue, additional or adjusted institutional design propositions are needed to facilitate learning processes. [67] This is especially true in addressing complex, cross-boundary and large-scale resource systems, such as river basins and delta areas in the Netherlands and South Africa or groundwater systems in Western Australia. Huntjens and his colleagues provide empirical support for a set of ten refined and extended institutional design propositions for the governance of adaptation to climate change (see box 1).[68] Together they capture structural, agency, and learning dimensions of the adaptation challenge and provide a

> **Box 1. Institutional Design Principles for Climate Change Adaptation**
>
> 1) Clearly defined boundaries
> 2) Equal and fair (re)distribution of risks, benefits and costs
> 3) Collective choice arrangements
> 4) Monitoring and evaluation
> 5) Graduated sanctions
> 6) Conflict prevention and resolution mechanisms
> 7) Minimal recognition of rights to organize
> 8) Nested enterprises or polycentric governance
> 9) Robust and flexible processes
> 10) Policy learning
>
> *Source:* Ostrom, 1990; Huntjens, 2010; Huntjens et al. 2012.

strong initial framework to explore key institutional issues in the governance of adaptation to climate change. These propositions support a *management as learning* approach to dealing with complexity and uncertainty. They do not specify blueprints, but encourage adaptation tuned to the specific features of local geography, ecology, economies, and cultures.

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65 Margaret Palmer et al., "Climate change and the world's river basins: Anticipating management options," Frontiers in Ecology and Environment 6, no. 1 (2008): 81–89; Stéphanie Hallegatte, "Strategies to adapt to an uncertain climate change," Global Environmental Change 19 (2009) 240–47; Louis Lebel and B. T. Sinh, "Politics of floods and disasters," in Democratizing Water Governance in the Mekong Region, ed. Louis Lebel, J. Dore, R. Daniel, and Y. S. Koma, 37–54 (Chiang Mai: Mekong Press, 2007); Lebel et al., "Adaption to Climate Change."

66 Patrick Huntjens et al., "Institutional design propositions for the governance of adaptation to climate change in the water sector," Global Environmental Change 22, no, 1 (2012): 67–81; Elinor Ostrom, Governing the Commons: The Evolution of Institutions for Collective Action (New York: Cambridge University Press, 1990); "A Diagnostic Approach for Going Beyond Panaceas," Proceedings of the National Academy of Sciences 104, no. 39 (2007): 11581–87.

67 Huntjens et al., "Institutional design proposition for the governance of adaptation to climate change in the water sector."

68 Marcus Wijnen et al., "Managing the Invisible: Understanding and Improving Groundwater Governance" (Washington, DC: World Bank, Water Partnership Program, 2012).

All parties—donor community, government, civil society, and others—must be aware that developing context-specific arrangements for all these elements is critical. The arrangements should take into account the environment in which local governmental and nongovernmental stakeholders have to operate, focusing on effective cooperation between them, the required capacity building and training of staff, joint information production and exchange, how to deal with corruption, and how to provide a positive incentive structure that stimulates accountability and responsiveness.[69]

The design principles have several potential uses in practice. First, by taking into account the issues they highlight, making and evaluating steps at different levels of governance can be made more adaptive. In this type of application, the design principles can be seen as diagnostic tools rather than blueprints for institutional reform. The specific solutions are almost always highly context dependent.

Second, the principles should be useful for exploring new and refining existing adaptation strategies by focusing more attention on their governance—in particular, how decisions about particular strategies are reached. This can help overcome the frequent neglect of power relations and interests in the making of adaptation policy.

Third, the principles may be useful not only to planning agencies and government processes but also to community-based organizations and the private sector actors interested in working with other stakeholders in proactive approaches to adaptation. Several of the roles implied by the design principles may be taken up effectively in some situations by nonstate actors and multistakeholder bodies.

3   Conclusion

Climate change has often been called the single biggest challenge for humanity over the coming centuries. Given the scale of the problem, its impacts on human life on earth, and the level of coordinated action required to solve it, this statement seems only adequate.

Our planet suffers from increasing pressure from population growth, economic development, and climate change. As a consequence, basic needs such as food, water, health, and shelter are in danger. Catastrophic weather events, variable climates that affect food and water supplies, new patterns of infectious disease outbreaks, and emerging diseases linked to ecosystem changes, are all associated with global warming and pose health risks. The ramifications of not responding adequately are far greater than any earlier threat to humanity in recent history.

Rejecting climate change because one does not like the possible causes, has the inherit danger of ignoring the devastating effects the real phenomenon has. Causes are in a way less relevant to map the possible impact of a changing climate and consequent erratic weather patterns. Research shows climate change has such an impact it is a threat multiplier for human disaster, security and ultimately conflict.

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69 Huntjens, Patrick, Claudia Pahl- Wostl, Benoit Rihoux, Maja Schlüter, Zsuzsanna Flachner, Susana Neto, Romana Koskova, Chris Dickens, and Isah Nabide Kiti, "Adaptive Water Management and Policy Learning in a Changing Climate: A Formal Comparative Analysis of Eight Water Management Regimes in Europe, Asia, and Africa," Environmental Policy and Governance 21, no. 3 (2011): 145–63.

Increasingly, climate change is framed as a security concern. Through a number of debates on the potential security implications of climate change, the European Council and the United Nations Security Council (UNSC) lifted the issue to the highest level of political discourse on matters of international peace and security. Also a number of governments, like the United States, India, Germany and the United Kingdom, identify climate change as a national security challenge.[70]

Many and even conflicting notions and dimensions of security coexist. Each entails a different set of assumptions about who is to be secured and from what threats. Depending on the logic used to define such links, concrete policy decisions and responses flowing from that logic may differ substantially.

This paper has addressed two broad categories of threats and related political measures: institutional security, both national and international, and human security.

One dominant threat is that climate change will lead to new or more intense resource scarcities, which, in turn, will trigger more intense competition and conflict between states and local communities sharing common resources.

Some of the negative impacts that climate change will have on human livelihoods are relatively straightforward. It is not difficult to imagine how land degradation, chronic droughts, and repeated crop failure will erode agricultural production and threaten the security of communities' livelihoods. Secondary impacts, however, may be equally important drivers of social conflict. Water shortages or malnutrition, for example, often lead to infectious diseases, which may be less visible but is an equally powerful determinant of poverty, socioeconomic exclusion, and conflict.

Natural disasters are now a primary cause of forced migration, and the effects of climate change are expected to intensify such disasters and accelerate displacement in the decades to come.

In short, climate change may exacerbate existing or create new socioeconomic stresses such as loss of arable land, resource scarcities, forced migration and weakening institutions, all of which could make a violent escalation of inter- and intrastate conflicts more likely.

Addressing increased scarcity of key resources caused by climate change, climate-induced migration and other impacts, demands measures by governments at all levels. It requires political measures focusing on policy and governance reform for advancing climate security. Precautions to prevent the potential devastating impact of climate change as a threat multiplier are urgently needed. Increased adaptive capacity at multiple levels is vital to improving the systemic ability to anticipate and respond to change rather than simply reacting to threats.

To be effective, multi-level governance and context-specific arrangements are critical. These arrangements need to take the environment in which local government and other stakeholders have to operate into account. It requires a focus on effective cooperation across levels, stakeholder participation, capacity building and staff training, joint information production

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70 McDonald, M (2013) Discourses of climate security. Political Geography 33 (2013) 42-51, page 42.

and exchange, how to deal with corruption, and how to provide a positive incentive structure, which stimulates accountability and responsiveness.

All the progress, capabilities and wisdom available to mankind needs to be deployed to its limit, and far beyond, if we want to survive and leave a healthy planet for the coming centuries.

4   Policy and Governance Recommendations

Based on our analysis, we identify the following key policy and governance reform recommendations for advancing climate security:

- **Integrate climate action and international peacebuilding efforts.**
  Current knowledge of links between climate change, human security, and social conflict indicates a need to integrate climate change mitigation and adaptation strategies with more general peacebuilding efforts. Peacekeeping and peacebuilding programs are usually not designed to build resilience against climate change impacts. However, as global warming progresses and communities come under increased strain, successful adaptation strategies have to be an important component in future peacebuilding strategies.

- **Build adaptive capacity at multiple levels, human as well as state, to advance climate security.**
  Climate change is understood as a threat to human security because it disrupts individuals' and communities' capacity to adapt to changing conditions. Increased adaptive capacity at multiple levels is vital to improving the systemic ability to anticipate and respond to change rather than simply reacting to threats.

- **Develop a conflict-sensitive approach to climate change mitigation and adaptation for preventing inter- and intrastate conflicts.**
  Eroding conditions for livelihoods caused by shifts in climatic conditions may contribute to the risk of violent intrastate conflict, especially in states unable to respond adequately to such changes. To prevent inter- and intrastate conflict, a conflict-sensitive approach to climate change mitigation and adaptation is needed. Best practice examples show that participatory approaches have reduced greenhouse gas emissions, built resilience, and adapting to the impacts of a changing climate.[71] The vital common denominator in all these examples is the empowerment of the poor as "solution owners."

- **Establish multilevel and multi-stakeholder climate governance.**
  To be effective, climate governance needs to include the macro level (intergovernmental and international), the meso level (regional, national, and subnational), and the micro level (municipal, local, and community). It also and especially needs to be nonterritorial (corporate, industrial, transnational, and transboundary).

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71 Ting Zhang, "A Conflict-Sensitive Approach to Climate Change Mitigation and Adaptation in the Urbanizing Asia-Pacific" (working paper no. 7, The Hague Institute for Global Justice, 2015).

Multilevel governance is needed to create the necessary linkages, by means of participation and deliberation, informed by context in order to incorporate political and public support, and verify and accredit activities on the ground. This in turn entails fine-tuning bottom-up learning processes with top-down policy strategies and visions.

Formulate institutional design proposals for climate governance at multiple levels.
The institutional design propositions for the governance of adaptation to climate change capture structural, agency and learning dimensions of the adaptation challenge. They also provide a strong initial framework to explore key institutional issues in the governance of adaptation. Context-specific arrangements are critical. These arrangements need to take the environment in which local government and other stakeholders have to operate into account. It requires a focus on effective cooperation, capacity building and staff training, joint information production and exchange, how to deal with corruption, and how to provide a positive incentive structure, which stimulates accountability and responsiveness.

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