

Global adaptation governance: An emerging but contested domain

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Abstract

Adaptation to climate change has steadily risen on global policy agendas and entered a new era with the 2015 Paris Agreement, which established a global goal on adaptation. While this goal responds to calls to strengthen global governance of adaptation, it has not yet been operationalized. Further, few studies take stock of current global adaptation governance to inform the implementation of the goal. Against this background this review asks: To what extent is there global governance of climate change adaptation? Can it be characterized as a strong domain of global governance? In what ways is it contested? Global adaptation governance is defined here as occurring when state and non-state actors in the global (including transnational) sphere authoritatively and intentionally shape the actions of constituents towards climate change adaptation as a public goal. Although empirical evidence is scant, it is proposed here that global adaptation governance is indeed emerging. Yet, its further strengthening appears contested. First, measurement of progress towards adaptation as a public goal at the global level is severely challenged by the ambiguity of adaptation and the lack of distinct metrics. Second, the lack of a clear global-level problem-framing, or recognition of adaptation as a global public good, has meant limited legitimacy of global governance initiatives. A consequence of contestation is that governance forms and functions used so far have not been authoritative in how they seek to shape actions. The review concludes by identifying research needs for advancing science and policy on adaptation.

This article is categorized under:

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KEYWORDS

adaptation, global governance, Paris Agreement

1 | INTRODUCTION

The recent Intergovernmental Panel on Climate Change (IPCC) Special Report on global warming of 1.5°C showed the urgency for societies to accelerate adaptation to climate change, by assessing that levels of risks had increased for four of the five “reasons for concern” compared with Fifth Assessment Report (Intergovernmental Panel on Climate Change, 2018, p. 12). Adaptation has steadily risen on global policy agendas over the last three decades. Whereas it was not addressed in the first IPCC assessment report in 1991 (Bassett & Fogelman, 2013), the 2015 Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) established several adaptation provisions. This included for the first time a global goal on adaptation: “enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2” (Article 7.1). Further, adaptation was explicitly recognized as a “global challenge” (Article 7.2). These provisions have yet to be operationalized, but they suggest a fundamental departure from the traditional idea that “mitigation is global, adaptation is local” (Burton, 2011, p. 481). They open up for the possibility of new institutions, processes, actors and accountabilities to govern adaptation (i.e., to promote, support, incentivize, regulate or impose adaptation actions) from a global level.

However, this problem urgency and these policy developments have not been adequately addressed in the academic literature so far. In contrast to the extensive literature on adaptation governance at sub-global levels, for example, community, local, urban, regional, and national (see, e.g., Biesbroek et al., 2010; Dodman & Mitlin, 2013; Meerow & Mitchell, 2017), there is limited knowledge about adaptation governance as currently exercised at the global level. Furthermore, the literature on global climate governance has typically been strongly, or even exclusively, focused on climate mitigation, rather than climate adaptation. This applies both to studies looking at intergovernmental governance efforts by state actors and to studies examining the role of non-state actors in transnational governance (Bulkeley et al., 2014) or hybrid multilateralism (Bäckstrand, Kuyper, Linnér, & Lövbrand, 2017).

The aim of this review article is therefore to empirically examine and discuss climate adaptation as a global governance domain.¹ To what extent is there global governance of climate change adaptation? Can it be characterized as a strong domain of global governance? In what ways is it contested?

Several strands of literature suggest that these questions and a broad review of global adaptation governance are particularly urgent and overdue. First, with respect to adaptation governance, there are an increasing number of empirical studies that question the assumption that adaptation is (only) a local concern (Liverman, 2015; Moser & Hart, 2015; Nalau, Preston, & Maloney, 2015) and discuss global and transnational dimensions (Benzie & Persson, 2019; Dzebo & Strippel, 2015; Hall & Persson, 2017). A series of normative claims around a perceived governance gap at the global level have also been made. Biermann (Biermann, 2005, 2014; Biermann & Boas, 2010) coined the term and has called for “global adaptation governance.” Khan (2013) calls for “a binding adaptation regime” and “a new norm of adaptation as a global public good.” Magnan and Ribera (2016) propose a “global adaptation framework.” Second, this emerging literature breaks with the strong tendency so far in the large global climate governance scholarship to study adaptation only in a very limited way or not at all, compared with mitigation-related initiatives (Bulkeley et al., 2014; Jordan et al., 2015).² Third, the Paris Agreement's strengthened provisions on adaptation in Article 7, including the global goal (see above), herald a new era and open new questions for research and practice as the provisions are to be operationalized (Lesnikowski et al., 2017; Magnan & Ribera, 2016).

In this review article, I first propose a definition of global adaptation governance that draws on the global governance literature and then review empirical evidence of how and where it is manifested. I propose that there is weak but emerging global adaptation governance. I then identify two causes of how further strengthening is contested. First, the nature of adaptation as a clear, unambiguous and accepted public goal is challenged by the lack of a precise definition and distinct metrics. Second, the lack of a clear global-level problem framing of adaptation, including as a global public good, means that the rationale for global-level governance is not fully accepted. A consequence of contestation is that governance forms and functions used so far have not been authoritative in how they seek to shape actions. This discussion is followed by conclusions and recommendations for further research.

2 | DEFINING GLOBAL GOVERNANCE

In the scholarship on global climate governance, a number of concepts and terms have been introduced to analyze how we have moved away from a single regime (the UNFCCC) consisting of predominantly state actors towards a more complex arrangement, such as regime complex (Keohane & Victor, 2011), networked climate governance (Bäckstrand, 2008),

transnational climate governance (Andonova, Betsill, & Bulkeley, 2009; Bulkeley et al., 2014), transnational regime complex (Abbott, 2012; Widerberg & Pattberg, 2017), and polycentric governance (Jordan et al., 2015; Morrison et al., 2017; Ostrom, 2010). These terms describe the system, while terms such as international cooperative initiatives (Widerberg & Pattberg, 2015) and non-state climate actions (Chan et al., 2015) describe units of study within the system. Whereas the regime complex concept draws attention to the many interacting international regimes (e.g., UNFCCC, trade regime, clubs), the other concepts draw attention to the enhanced role of non-state actors in global governance. Recent work has sought to nuance the claim of a broad shift towards non-state actors leading governance efforts. This literature looks at the interrelationship between actors by examining how states and intergovernmental organizations (IGOs) “orchestrate” transnational initiatives (Hale & Roger, 2014) and how there is in fact a dynamic relationship between transnational initiatives and national-level government policy (Andonova, Hale, & Roger, 2017). “Hybrid multilateralism” is another concept, which aims to capture how non-state actors are in the post-Paris era not only developing initiatives but also overseeing the monitoring and implementation of state commitments (Bäckstrand et al., 2017).

To conceptualize adaptation governance at the global level, I start by using the seemingly broadest concept here: global governance. At this initial stage it is important to capture the entirety of international regimes, state actors and non-state actors involved. Future research should examine which of the above concepts provide most precision and analytical leverage for accurately characterizing and explaining the governance domain and the interrelationships between actors and institutions.

Weiss and Wilkinson (2014, p. 208) explain how the concept of “global governance” emerged as a reference “to collective efforts to identify, understand, or address worldwide problems and processes that went beyond the capacities of individual states.” It thus went beyond the study of international organization and international law. In a similar vein, Lederer (2015, p. 3, citing Zürn 2013) defines global governance as “the entirety of regulations put forward with reference to solving specific denationalized problems or providing transnational common goods.” This suggests that non-state actors can contribute to putting forward regulations within this “entirety”, which is picked up by Biermann et al. in their definition of “global governance architecture” as “the overarching system of public and private institutions that are valid or active in a given issue area of world politics” (Biermann, Pattberg, van Asselt, & Zelli, 2009, p. 15).

Noting a tendency of conceptual stretching over time (see also Weiss & Wilkinson, 2014), Dingwerth and Pattberg (2006) defends the analytical value of global governance by identifying the concept's defining features. First, it is not limited to the international *level* of governance, but “conceives of world politics as a multilevel system in which local, national, regional, and global political processes are inseparably linked” (p. 192). Rosenau (1995, p. 13) went even further to propose it encompasses “systems of rule at all levels of human activity.” Thus, global governance refers not just to the “top-scale” of human activity but to the “sum of all scales of activity” (Dingwerth & Pattberg, 2006, p. 188). Second, it recognizes new *actors* as sources of authority alongside states in a nonhierarchical manner, such as nongovernmental organizations (NGOs), transnational corporations and scientific actors (Dingwerth & Pattberg, 2006, p. 191). Third, it assumes that a wide variety of *forms of governance* coexist, in a nonhierarchical way. According to Weiss and Thakur (2010), these forms encompass both (a) hard rules (laws and treaties) and institutions with administrative structures and (b) informal (e.g., practices, guidelines) and temporary forms (e.g., coalitions of the willing). Rosenau (1995) qualifies his conception of global governance in that the “system of rules” must be intentional.

Despite establishing the term and repeatedly discussing “global adaptation governance,” Biermann has not proposed a functional definition (Biermann, 2005, 2014; Biermann & Boas, 2010). For deriving a working definition that relate to the three defining features above, I draw on Bulkeley et al.'s (2014, p. 14) definition of governance as involving “authoritative attempts to shape the actions of constituents towards some form of public purpose.” Further, I draw on the three common features of global governance definitions identified by Andonova et al. (2009, p. 56): (a) it is concerned with public goals, (b) it involves a process of steering, and (c) it is regarded as authoritative. Using these building blocks, I propose that global adaptation governance occurs *when state and non-state actors in the global (including transnational) sphere authoritatively and intentionally shape the actions of constituents toward climate change adaptation as a public goal.*

3 | THE EVOLUTION OF GLOBAL ADAPTATION GOVERNANCE

In this section, I use the working definition above to describe the extent and character of global adaptation governance to date, and how it has evolved. As a heuristic support, Figure 1 illustrates how it is necessary to specify whether we focus on (a) level of governance, (b) scale of the adaptation problem, or (c) type of actors when examining global governance. These three dimensions can combine in different ways, illustrated by the dotted lines. An adaptation problem that is global in scale does not necessarily have to be governed at the global level only or by actors with global reach only. In this study, however, we are

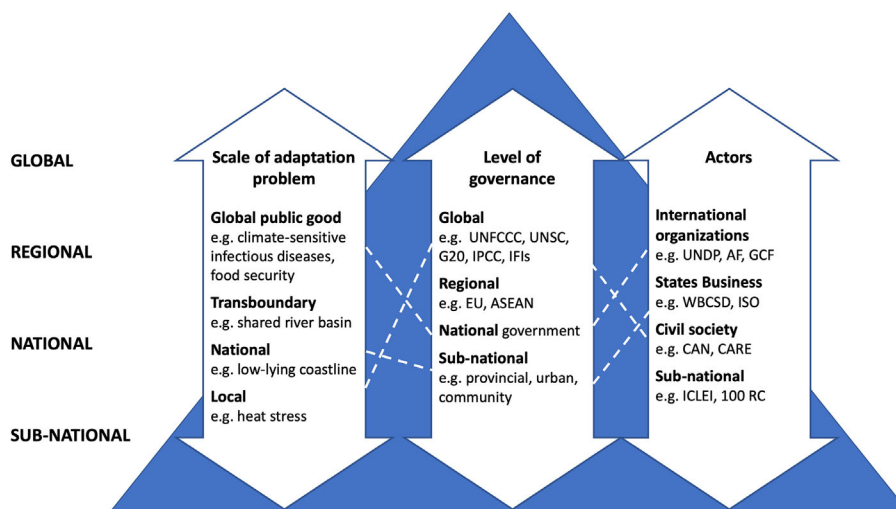


FIGURE 1 Three dimensions for conceptualizing global adaptation governance. Note: United Nations Framework Convention on Climate Change (UNFCCC); United Nations Security Council (UNSC); Group of 20 (G20); Intergovernmental Panel on Climate Change (IPCC); International financial institutions (IFIs); European Union (EU); Association of Southeast Asian Nations (ASEAN); United Nations Development Programme (UNDP); Adaptation Fund (AF); Green Climate Fund (GCF); World Business Council for Sustainable Development (WBCSD); International Standards Organization (ISO); Climate Action Network (CAN); Local Governments for Sustainability (ICLEI); 100 Resilient Cities (100 RC)

interested in the global level of governance (top part of the middle column), which is here seen to include international processes (UNFCCC and IPCC processes and other fora, such as G20, UN General Assembly, Organisation for Economic Co-operation and Development [OECD]) and transnational initiatives (such as those registered in the Global Climate Action Portal). This level may address adaptation challenges at the global scale (left-hand column), but it may also govern how national or local adaptation challenges are to be acted upon (e.g., through multilaterally financed adaptation projects). The relationship between level of governance and scale is further discussed below. Actors (right-hand column), finally, may source their authority and legitimacy at a specific level, but can often choose to engage at various levels. For example, a city government may source their authority at local level, then mobilize in a city network to influence global-level governance decisions, which may then ultimately target the local scale of adaptation. In this way, the notion of “level of governance” is not simple or one-dimensional.

3.1 | The UNFCCC process

Tracing the history of global adaptation governance shows that it was dominated by state actors and some IGOs and strongly concentrated to the IPCC and UNFCCC processes. The history of adaptation under the UNFCCC has been thoroughly documented and analyzed (Ciplet, Roberts, & Khan, 2015; Khan, 2013; Khan & Roberts, 2013; Moore, 2010; Schipper, 2006; Sovacool & Linnér, 2016; Verheyen, 2002). Although adaptation is today pursued by a range of actors and institutions at multiple levels, the UNFCCC regime is still central for shaping governance and politics of adaptation, by defining rules and norms on the division of responsibilities, by creating a demand for adaptation knowledge, and by hosting an arena for showcasing and exchanging adaptation practices.

In brief, Khan and Roberts (2013) identify three distinct phases in international adaptation policy up until 2013. First, there was an “unsteady foundation” laid in the 1990s, where “facilitative” rather than direct action commitments were made by Parties in the 1992 Convention text (see Articles 4.1b,e). A key reason for the limited attention in the first decade of UNFCCC negotiations is that adaptation was for a long time an “overlooked cousin” of climate mitigation (Schipper, 2006), and seen as a “taboo” topic (Pielke, Prins, Rayner, & Sarewitz, 2007) or “defeatist” option, in that it was portrayed as offering an alternative to ambitious mitigation commitments (Khan & Roberts, 2013). Initial commitments to provide adaptation finance were made, but without institutional arrangements.

Second, there was further “stumbling” but a steady rise up the agenda in 2001–2007, as the IPCC presented more evidence of impacts. Adaptation seemed an unavoidable consequence of the US pulling out of the Kyoto Protocol. Advances were made on establishing adaptation funds, introducing National Adaptation Programmes of Action (NAPAs) for least developed

countries (LDCs), and programs on knowledge-sharing. The idea of a separate Adaptation Protocol was raised within the Group of 77, but not negotiated upon (Verheyen, 2002). This idea can be seen as representing a “parallelism” tendency; to seek corresponding provisions and structures for adaptation to those used on the mitigation side (Helgeson & Ellis, 2015).

In the third phase from 2007 onwards, adaptation developed into a “framework,” by becoming institutionalized as an equal pillar to mitigation in roadmaps for negotiating a future global agreement. This was underpinned by a more explicit recognition of adaptation needs in the IPCC Fourth Assessment Report (Intergovernmental Panel on Climate Change, 2007). A quantified climate finance commitment was made by developed countries in the 2009 Copenhagen Accord, and the 2010 Cancun Adaptation Framework established the Adaptation Committee, the Standing Committee on Finance, National Adaptation Plans (NAPs) to be prepared by developing countries, and a work program on loss and damage.

By 2015, the recognition of climate change adaptation as a public goal had thus increased from the weak statement in Article 4.1b in the 1992 Convention, to more forceful statements in the Bali roadmap and Cancun Adaptation Framework. State actors had begun to intentionally shape the actions of constituents, in this case UNFCCC Parties, towards the goal, but the question is: how authoritatively so? The forms of governance accumulating over the pre-2015 time period can be functionally categorized into four groups, each of which contain a variety of “harder” and “softer” rules, norms and principles (Hall & Persson, 2017):

- *Substantive commitments to undertake adaptation*—Parties committed to facilitate or implement adaptation at country level, but unlike for mitigation (with carbon dioxide equivalents) no definition or single metric was been agreed to quantify such commitments.
- *Procedural commitments to plan and report adaptation*—All countries were to report on adaptation planning and implementation in their National Communications, and developing countries were invited and funded to develop NAPAs and NAPs.
- *Commitments and rules on adaptation finance*—Developed countries committed to provide finance and report on it, and, for developing countries as recipients, rules on eligibility and norms on priority activities were agreed by the Parties and fund boards.
- *Knowledge development and sharing*—Several initiatives (e.g., Nairobi Work Programme, Private Sector Initiative, Local Coping Strategies) and databases were set up,³ with the Adaptation Committee as a core institution.

Whereas adaptation finance is typically seen as the most important and by far the most studied form of governing adaptation (see, e.g., Amerasinghe, Thwaites, Larsen, & Ballesteros, 2017; Ciplet, Roberts, & Khan, 2013; Persson & Remling, 2014; Pickering, Betzold, & Skovgaard, 2017; Stadelmann, Roberts, & Michaelowa, 2011; United Nations Environment Programme, 2016; Weiler, Klöck, & Dornan, 2018), all four groups in some way govern whether, how, and to what extent adaptation is undertaken at country level.

Explaining the rise of global adaptation governance, although limited to the UNFCCC process, Khan and Roberts (2013) propose that increasing scientific evidence of climate change and lack of progress on mitigation meant that adaptation simply became unavoidable. Presumably, the discourse on an already existing “adaptation gap” reinforced this (United Nations Environment Programme, 2014). Using a realist perspective, they also point to political conditions that made interests of developed and developing countries converge. With the lack of progress on mitigation and desire to have global participation in a future climate agreement, adaptation became a “winnable” strategy for both sets of Parties despite initial asymmetry in preferences. Adaptation finance was promised as a material concession, to secure support for a mitigation agreement (Ciplet, 2015). In addition, Khan and Roberts argue that supporting preventive adaptation governance became a politically safer option than passivity, as the threat of climate litigation was growing and loss and damage emerged as a separate agenda item. Further, asymmetric preferences on adaptation as development versus adaptation as equity could be reconciled through the technical and politically diffused concept of “adaptive capacity” (Moore, 2010).

With the 2015 Paris Agreement, a new era and fourth phase for adaptation governance started. Outside of the UNFCCC process, adaptation governance had by then progressed at the national and sub-national level, increasing the bottom-up pressure for enhanced global governance. The IPCC Fifth Assessment Report reported more extensively on adaptation (Intergovernmental Panel on Climate Change, 2014).

In the Paris negotiations, developing countries insisted on the same legal nature of all commitments (mitigation, adaptation, finance) (Rajamani, 2015) and a quantified adaptation finance target (Sharma, 2017), whereas developed countries wanted to “skirt” adaptation and pre-empt any legal obligations on finance, compensation and technology transfer and instead focus on an ambitious mitigation deal and transparency (Dimitrov, 2016). The outcome can be seen as a compromise, with a set of

novel provisions on adaptation under Article 7. These include the global goal on adaptation (see above), committing Parties to plan and implement adaptation actions, submitting adaptation communications, enhanced international support to developing country Parties, and using the global stock-take to review adequacy and effectiveness of adaptation and its support and to review progress on the global goal.

Did the Paris Agreement introduce more authoritative means of governing and shaping behavior? Legal scholars considering all elements of the Paris Agreement, find that adaptation provisions are weak (Bodansky, 2016; Dimitrov, 2016; Rajamani, 2016). Most adaptation provisions are expressed as recommendations and understandings, with considerable discretion for Parties how to meet them (“as appropriate”). No quantified adaptation finance target was set. In Sharma's (2017, p. 38) view, “the focus remains once again on planning, assessing, sharing information, and reporting”. Studying the legalization of adaptation before and after Paris, Hall and Persson (2017) note a nominal increase in adaptation-related provisions and forms of governance used under the UNFCCC. They conclude, though, that they are characterized by low obligation and low precision, with the latter seemingly acting as a limiting factor.

Lesnikowski et al. (2017) offer a more positive evaluation and identify several strengths of the Paris Agreement, compared with previous provisions. First, it introduces stronger and more formalized adaptation commitments, which should like mitigation commitments be subject to progression over time (Article 3; see also Rajamani, 2016). Adaptation may be included in National Determined Contributions and adaptation communications are to be submitted. These provisions apply to all countries in a universal way, as compared with NAPAs and NAPs only applying to developing countries.

Second, it introduced the global goal (see above) as a first collective commitment. In the end, a vague and qualitative goal was agreed, rather than a quantified goal with predetermined indicators (including financial support provided; see ActionAid, CARE, & WWF, 2016; Ngwadla & El-Bakri, 2016). Nevertheless, it provides a directionality of effort, especially when coupled with the impetus to review “adequacy and effectiveness” of adaptation as part of the global stock-take every 5 years. Difficult conceptual, methodological and political challenges remain with measuring, aggregating and reviewing adaptation in ways that are comparable and robust, yet context-sensitive (Ford et al., 2015; Lesnikowski et al., 2017), and the Adaptation Committee and LDC Expert Group failed to after Paris find methods to review “adequacy and effectiveness” (United Nations Framework Convention on Climate Change, 2017). But a process is in place and structured approaches to reporting are being developed (United Nations Environment Programme, 2017).

Third, the Paris Agreement is explicit about the multilevel nature of adaptation governance, by, in addition to the global goal, recognizing that “adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions” (Article 7.2). All in all, Kinley (2017, p. 11) argues that, with the Paris Agreement, “adaptation has come into its own.”

3.2 | Other international institutions and governance domains

With a view towards broader global climate governance and expanding the focus from the UNFCCC as an intergovernmental governance process, Lesnikowski et al. (2017, p. 828) argue that the new framing of adaptation as a “global challenge” in the Paris Agreement is more in line with a characterization of the global climate change regime as less state-centric, less top-down and more shaped by diverse actor networks. Below, I first review if and how other international regimes and IGOs have engaged in global adaptation governance, followed by a review of transnational governance initiatives.

Regarding international institutions and IGOs beyond the UNFCCC, no comprehensive, large-*n* and systematic mappings have yet been published. This is surprising considering how well IGO involvement in mitigation governance and other domains of global environmental governance has been mapped (see, e.g., Keohane & Victor, 2011; Widerberg & Strippel, 2016). Preliminary work, however, identified almost 50 IGOs (including, e.g., the Food and Agricultural Organization, the World Trade Organization, the International Energy Agency, the International Labour Organization) currently conducting some form of adaptation governance, such as offering capacity-building, including adaptation in their institutional goals, and developing local and national adaptation projects (Weitz & Persson, 2016). When coding the thematic focus areas of these IGOs and their adaptation governance activities, examples were found in all seven domains of global governance identified as critical to adaptation by Biermann and Boas (2010)—food, water, health, energy, refugees, economic stability, and security. But also additional domains were identified, including disaster risk reduction, infrastructure and technological innovation, nature conservation, and human settlements.

Other studies also conclude that adaptation governance is practiced in various domains, such as development (Ayers & Huq, 2009; Gupta & van der Grijp, 2010), migration (Hall, 2016; Opitz Stapleton, Nadin, Watson, & Kellett, 2017), security (Dellmuth, Gustafsson, Bremberg, & Mobjörk, 2018), and disaster risk reduction (Birkmann & von Teichman, 2010;

Schipper, Thomalla, Vulturius, Davis, & Johnson, 2016). Considering adaptation finance as a specific form of governing adaptation, a range of international institutions that do not have climate adaptation as their primary organizational goal are involved in its design, allocation and implementation (e.g., World Bank, World Food Programme, UN Environment; Bird, Watson, & Schalatek, 2017). There is a clear need for more empirical research, though, on whether and to what the extent institutions and IGOs in different domains are contributing to global adaptation governance.

3.3 | Transnational adaptation governance

Turning to the involvement of non-state actors, Dzebo and Stripple (2015) coined the term transnational adaptation governance and operationalized it by looking at participation in adaptation finance projects funded by the Global Environment Facility. They found limited involvement of non-state actors, but since their study several transnational initiatives have been launched or gained momentum, such as the Global Alliance for Climate-Smart Agriculture, 100 Resilient Cities, InsuResilience, ResilientAfrica Network, Coral Triangle Initiative, the Business Alliance for Water and Climate, and the International Flood Initiative. Private sector actors are showing increasing interest in the adaptation agenda (Surminski, 2013), as seen for example with the Private Sector Initiative under the UNFCCC Nairobi Work Programme (Pauw, Klein, Vellinga, & Biermann, 2016) and with the International Organization for Standardization developing a new adaptation-related standard.⁴

Under the UNFCCC Marrakech Partnership for Global Climate Action, which invites non-state actors, growing emphasis is being placed on adaptation. Almost half of the surveyed initiatives address either mainly adaptation or both mitigation and adaptation. Although the number of actions that mainly address mitigation is still larger, compared to the 2014 UN Climate Summit and the Lima-Paris Action Agenda there is a more balanced consideration of both adaptation and mitigation (UN Climate Change Secretariat, 2017). It should be noted, however, that a review of 52 climate action initiatives launched in 2014 showed that a majority of the initiatives focusing on “climate resilience” (as an objective of adaptation) were still only intentions after 2 years and had yet to produce any outputs (Chan, Falkner, Goldberg, & van Asselt, 2016). Two more recent evaluations have found that effectiveness has been limited (Chan & Amling, 2019; Dzebo, 2019).

3.4 | Summary: An emerging domain

Using the working definition proposed here, it can be concluded that a global adaptation governance has evolved, from non-existent in the early 1990s to a clearly emerging governance domain today. We can observe predominantly state actors, but increasingly also non-state actors, engaging in the global and transnational sphere to intentionally shape the actions of constituents toward climate change adaptation as a public goal. The effectiveness of these efforts for achieving the goal of adaptation, however, appears limited so far but requires more evidence and evaluation.

While the global governance literature does not provide indicators to validate that a new domain has been established, we can draw on governance studies at the national level. Massey and Huitema (2012) have investigated whether adaptation has become a “policy field” in England, noting that analysts often take a policy field as given. In Table 1, I use their three criteria and associated indicators for what constitutes a policy field and apply them to the global level. Assuming we can make such parallels between national policy fields and global governance domains, Table 1 reinforces the conclusion that climate adaptation is a clearly emerging global governance domain.

Yet, the emergence of global adaptation governance has been contested. We saw above how developed countries have generally tried to contain adaptation provisions in the UNFCCC regime and how a global goal was not favored. This stance has been reinforced by a dominant “territorial” framing of adaptation in science and policy, in which adaptation is highly place- and context-specific and does not lend itself easily to generalized global-level governance (Benzie & Persson, 2019). While there is now an increasing recognition that some adaptation problems might be global or transboundary in scale, establishing new global-level governance arrangements has been contested on the basis that they can lead legal over-reach and that existing institutions can be deployed (Banda, 2018). In the remaining of this article, we dig deeper into two grounds for contestation.

4 | UNPACKING GLOBAL ADAPTATION GOVERNANCE: CONTESTED ELEMENTS

As noted above, it can be questioned whether adaptation is really a clear and broadly accepted public policy goal and, as such, merits its own governance domain. Further, is there broad support for expanding the global level of governance in view of

TABLE 1 Indicators for policy fields, with added examples at global level

Substantive authority	Institutional order	Substantive expertise
Indicators (national level)		
Public laws/legislation; policy measures and programs; regulations/rules; procedures/plans; judicial rulings; material resources/government expenditure; hearings and official inquiries	Ministry; ministerial office; agencies; parliamentary committees; special departments	Policy proposals; policy papers; issue papers; research programs; reports and studies; academic articles; nongovernmental advisory bodies; steering groups; task forces; interest/lobby groups; policy/issue networks; academic courses; experts; think tanks; NGOs; unions
Global examples (intergovernmental and transnational)		
UNFCCC Convention, Kyoto Protocol, and Paris Agreement; Adaptation plans/reporting under the UNFCCC; Multilateral adaptation funds (e.g., AF, GCF, LDCF, PPCR, IFAD adaptation for smallholder agriculture program); Bilateral adaptation funds; ISO standard (under development); International funds climate-proofing guidelines; Membership criteria of transnational adaptation networks and initiatives (e.g., 100 resilient cities)	UNFCCC COP and Paris Agreement CMA; SBI and SBSTA; Adaptation Committee, LDC Expert Group, Standing Committee on Finance; UNFCCC Secretariat Adaptation Team; Boards of multilateral adaptation funds; Marrakech Partnership for Global Climate Action; Boards and governing councils of IGOs governing adaptation; Boards and governing councils of transnational adaptation initiatives	IPCC assessment reports; UNFCCC and IGO policy papers, technical reports and technical workshops on adaptation; Nairobi work Programme; NAP global network; UNFCCC constituencies (e.g., RINGO, BINGO, IPO); Global commission on adaptation; academic networks (e.g., adaptation futures conferences) and articles (many journals); NGO networks (e.g., climate action network); think tanks (e.g., WRI, SEI, IIED, ACTS)

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other levels? In this section, I discuss these two grounds for contesting global adaptation governance, followed by a discussion of a consequence; whether governance efforts sufficiently authoritative to effectively steer constituents.

4.1 | Adaptation: A public goal?

Considering broad-based scientific agreement on the need for enhanced adaptation (see, e.g., Intergovernmental Panel on Climate Change, 2014; Stern, 2007; United Nations Environment Programme, 2014) and the codification of political will to act on this, in UNFCCC agreements as well as national policies (see, e.g., Biesbroek et al., 2010; Mimura et al., 2014), adaptation definitely seems accepted as a public goal—at a general and rhetorical level. However, the lack of a politically agreed definition of adaptation under the UNFCCC (Schipper, 2006) and the inherently indistinct and fuzzy nature of the concept (Ford et al., 2015), means that it is still open to many potentially diverging interpretations when it comes to translating it into operational goals and governance approaches.

First, can adaptation be a positive public goal, or is it a fundamentally reactive and involuntarily imposed goal, in that actors and institutions would primarily wish to avoid climate impacts and the need to adapt? This question is apparent in the debate on adaptation strategies. Given the high uncertainty of future climate impacts, “no-regrets” or “low-regrets” adaptation strategies have been promoted, to avoid excessive costs and ensure robustness (Hallegatte, 2009). This approach has a conservative tone and can be contrasted with the notion of “transformational adaptation” which seeks to convey a positive vision of system-wide rather than incremental change (Dupuis, 2018; Gillard, Gouldson, Paavola, & Van Alstine, 2016; Kates, Travis, & Wilbanks, 2012). At the global level, it could be expected that, with more actors to agree, there would be a tendency towards low-regrets approaches, as representing a lowest common denominator. However, as new climate impact science is demonstrating that effective adaptation is increasingly a necessity, it is likely that adaptation shifts from a “low-politics” to a “high-politics” issue. Raising the stakes, this could mean that global governance is either more pursued, by those who support international cooperation, or more contested, by those who wish to protect national sovereignty.

Second, is adaptation a goal in itself or a means to end? In the context of global adaptation governance, the raises questions around institutional design, that is, whether institutions should strive for *adaptability*, as an organizational feature or property, rather than the setting up specific and stand-alone governance initiatives and institutions for *adaptation*. Increased general adaptability of international institutions is essentially what Biermann calls for in his vision of global adaptation governance (see also Dupuis, 2018).

This question echoes a long-standing governance question at national and sub-national levels: whether adaptation is best pursued through a “mainstreaming” approach or a dedicated, stand-alone approach (Runhaar, Wilk, Persson, Uittenbroek, & Wamsler, 2017). The rationale for a mainstreaming approach is quite evident given the highly multi-sectoral nature of adaptation. However, it is also associated with some risks, such as: diffusion of responsibility and poor accountability mechanisms; “policy dilution”, symbolic measures and relabeling of policy within institutions that identify with other primary goals; and reduced political visibility which can impact resource allocation and public support (Dupuis, 2018; Persson & Klein, 2009; Runhaar et al., 2017). It is thus not an easy choice for institutions, regardless of governance level. However, according to Massey and Huitema (2012), approaching global adaptation governance as a specific domain vis-à-vis a cross-cutting “adaptability” norm may be a false choice. They argue that mainstreaming an adaptability norm can be a means of implementation (within a given policy field) under an overall strategy of establishing a domain. In this way, they are reconcilable. With this reasoning, the uptake of adaptation as a norm (or goal) by institutions and actors in established global governance domains can thus be seen as part of an emerging global adaptation governance domains, and not as counteracting forces.

Third, in liberal democracies, a public goal normally comes with an expectation of criteria and metrics for measuring progress, to hold actors and institutions accountable. As mentioned, adaptation is a fuzzy concept and its measurement face difficult methodological and data challenges (including baselines, timing, attribution). This means that a single or small set of metrics have not yet been explicitly agreed in the UNFCCC process or beyond, despite much analytical work underway. A wide set of (sector-specific) metrics were reported by countries in their Intended Nationally Determined Contributions (INDCs) ahead of Paris and ideas circulate on more general and aggregated ones (Table 2). Still, these metrics are far off the comparability of, for example, a unit of carbon dioxide equivalent. The global goal of the Paris Agreement as a “North Star” for a global adaptation governance will therefore have to rely on more complex and diverse metrics and reporting as a basis for accountability. For global adaptation governance, this means that it is hard to measure the extent to which individual actions are contributing to a shared global goal. Unless there are compelling incentives for adaptation action at the local and national level, this might undermine the global call to action.

TABLE 2 Examples of adaptation metrics—based on synthesis of INDCs and added “general” examples

Sector/area	Example metrics
General	<ul style="list-style-type: none"> • Number of people supported in a certain sector or region • Financial resources spent on adaptation in a sector or region • Percentage of populations, sectors, or proportion of GDP at risk • Economic assets saved from destruction by climate change impacts (saved wealth) • Human lives and health protected (saved health)
Water	<ul style="list-style-type: none"> • Ensure full access to drinking water by 2025 • Increase water storage capacity from $x \text{ m}^3$ to $y \text{ m}^3$ in 2015–2030 • Increase desalination capacity by $x\%$ from 2015 to 2025
Agriculture	<ul style="list-style-type: none"> • Convert x million hectare grain fields to fruit plantations to protect against erosion • Increase the amount of irrigated land to x million hectares • Reduce post-harvest crop losses to $x\%$ through treatment and storage
Ecosystems and biodiversity	<ul style="list-style-type: none"> • Protect $x\%$ of marine environments by 2020 • Regenerate $x\%$ of degraded forests and rangelands • Establish x ha marine protected areas
Forestry	<ul style="list-style-type: none"> • Increase forest coverage to 20% by 2025 • Maintain $x\%$ forest coverage • Achieve $x\%$ deforestation rate by 2030
Disaster risk reduction	<ul style="list-style-type: none"> • Ensure that all buildings are prepared for extreme events by 2030 • Reduce the number of the most vulnerable municipalities by at least $x\%$ • Relocate x number of households
Energy	<ul style="list-style-type: none"> • Ensure that hydropower generation remains at the same level regardless of climate change impacts • Increase the proportion of renewable energy to $x\%$ by 2030
Other	<ul style="list-style-type: none"> • Ensure that $x\%$ of national territory is covered by climate change adaptation plans by 2030 • Reduce moderate poverty to $x\%$ by 2030 and eradicate extreme poverty by 2025

Finally, to what extent is adaptation a *public* goal, to be pursued through global governance? The IPCC has for long recognized both autonomous (private) and planned (public) adaptation (Dupuis & Biesbroek, 2013), but this has not really translated into political theory on an appropriate division of responsibility between state, markets, and individuals. Social contract theory has been used to empirically analyze this division in the case of flood management in the United Kingdom and Ireland (W. N. Adger, Quinn, Lorenzoni, Murphy, & Sweeney, 2013), but otherwise this question is dominated by economic analysis. Some economic literature identifies only or primarily private benefits of adaptation (Barrett, 2008; Hasson, Löfgren, & Visser, 2010), while other studies identify a greater potential for public benefits (Cimato & Mullan, 2010; Organisation for Economic Co-operation and Development, 2015). Further theorization from political science and climate governance studies is needed to offer models of when adaptation might be a public goal and when a private goal, to advance agreement and reduce contestation.

Altogether, while adaptation is an accepted public goal *at a general level*, many ambiguities and diverging interpretations remain when it comes to formulating more specific goals and responsibilities. This seems to have hindered the development of more specific, targeted and legally binding governance efforts. Dupuis (2018) concludes that adaptation “hardly comes with univocal expectations about the societal goals to be reached” but instead allows for polysemy. Paradoxically, this unclarity may render it more attractive for new actors and institutions to adopt, since they can use ambiguity strategically (Hall, 2017). It is relatively easy for new actors, whether IGOs or transnational actors, to align their own goals and norms with adaptation and thus contribute to global adaptation governance. In this way, this ambiguity and openness enable global adaptation governance to *expand*, but not necessarily to be *strengthened*, through more specific, targeted and binding governance efforts.

4.2 | Global-level governance: A critical and plausible level?

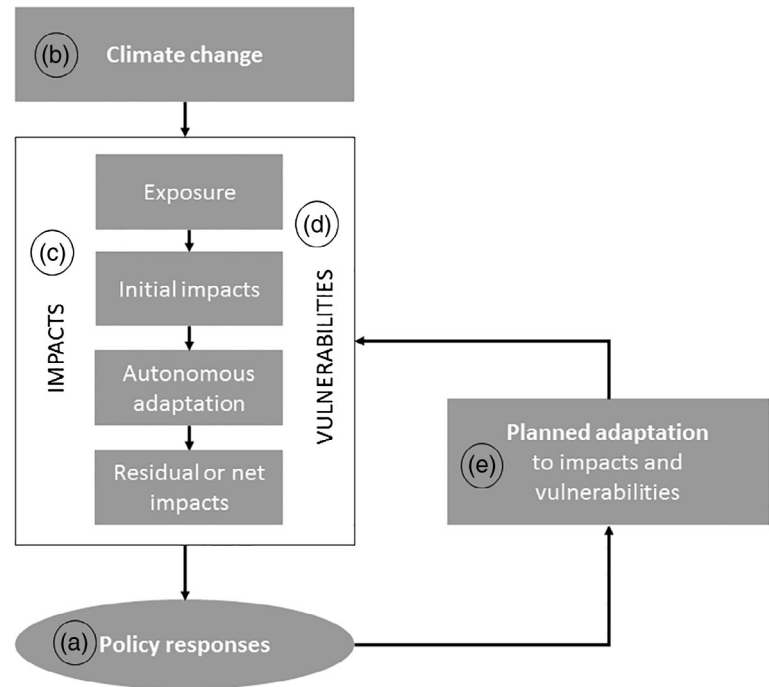
That adaptation is de facto governed at multiple levels is broadly accepted (N. Adger, Arnell, & Tompkins, 2005). This view seems consistent with the conception of global governance as the “sum of all scales” (Dingwerth & Pattberg, 2006). Here, I review literature on the relative significance of levels and the particular role and rationale for the global level, which taps into debates on the nature and scale of adaptation problems (Figure 1, left column). The calls for enhanced global adaptation governance by Biermann, Khan, and Magnan and Ribera start from the observation that adaptation has predominantly been framed as a local and national problem, but that this is insufficient. The question is, does adaptation represent a “worldwide” or “denationalized” problem, so that global governance is warranted (Lederer, 2015; Weiss & Wilkinson, 2014)?

The view that adaptation is a local issue and/or that it should be governed at the local level is widely held, in several disciplinary fields (economics, human geography, policy studies) (N. Adger et al., 2005; W. N. Adger, 2001; Barrett, 2008; Corfee-Morlot, Cochran, Hallegatte, & Teasdale, 2011; Hasson et al., 2010; Howlett & Kemmerling, 2017; Mace, 2005). The IPCC Fourth Assessment strongly focuses on local and national level when reviewing adaptation governance and the local is seen as “constrained” by higher levels of government (Klein et al., 2014; Noble et al., 2014). From a cultural geography perspective, Hulme (2008) has emphasized the place-based nature of climate change and need for local responses. In a systematic literature review of documents commenting on the localness of adaptation, less than a 10th criticized assumption that adaptation is a local issue (Nalau et al., 2015).

However, strongly holding this assumption seems increasingly flawed, for several reasons. Nalau et al. (2015) argue that while adaptation is *practiced* at local level, it does not necessarily follow that it is best *governed* at local level. This is illustrated by the separate columns in Figure 1. Further, from a climate impact point of view, there is a growing literature and evidence base on transboundary climate risks, international spill-overs, teleconnections, cascading risk and global systemic risks (Benzie, Hedlund, & Carlsen, 2016; Challinor, Adger, & Benton, 2017; Galaz et al., 2017; Liverman, 2015; Moser & Hart, 2015; Otto, Willner, Wenz, Frieler, & Levermann, 2017). This view stipulates that a global perspective is needed to understand both exposure to “imported” climate impacts and interdependencies between adaptation efforts across the globe. It begs the question whether adaptation represents a global public good, besides the local or national benefits it provides. Finally, as described above, the Paris Agreement explicitly frames adaptation as a “global challenge,” which means a legal framework is already in place.

How then to understand adaptation as a global challenge? There is a need to organize different perspectives on scale and level, according to what part of the causal chain they address: nature of the problem, implementation of actions, governance and collective action required to secure implementation, scale where benefits of adaptation materialize, etc. The flowchart used in the 2001 IPCC assessment report is simplistic but provides a basis for developing a heuristic tool for the discussion here (Figure 2). In this flowchart, “policy responses” (A) corresponds with our entry point and unit of analysis; governance responses. Here, we are interested in the subset which are introduced at the global level by state or non-state actors

FIGURE 2 Understanding scales and levels of adaptation governance. (Reprinted with permission from Smit and Pilifosova (2001, p. 881, fig. 18-1). Copyright 2001 United Nations Framework on Climate Change)



(e.g., UNFCCC provisions, transnational initiatives to develop best-practice, adaptation funds)—rather than governance responses at regional, national, or local level.

At the broadest level, one argument is that “climate change” (B) is “a problem caused by the world’s nations [and] needs to be solved by the global community” (Khan & Roberts, 2013, p. 186). This argument collapses moral responsibility with development of practical solutions, which does not seem given. Theoretically, financial transfers could be made to vulnerable countries in response to the responsibility question, with no or little active governance of what kind of and how much adaptation to undertake. In terms of matching problem to governance solution, more precision is feasible when looking at “impacts” (C). As described above, a traditional focus on local impacts within local or national borders is gradually being complemented with identification of transboundary and borderless climate risks and impacts, for example, food supply shocks, rapid migration flows, and water insecurity in transboundary river basins. If countries are exposed to such imported impacts, there should be an interest to govern adaptation as close to the source of the impact as possible. Such impacts could be addressed through unilateral, national governance responses, but bilateral, regional and global responses might be more effective and sustainable (e.g., international trade regulations, migration agreements, river basin commissions; Benzie & Persson, 2019). Transboundary impacts thus appear as a clear case for global-level governance.

Global dimensions of vulnerability (D) have also been identified, in that communities may experience “double exposure” to climate change and economic globalization (O’Brien & Leichenko, 2000) and that climate vulnerability can have global drivers. These mechanisms are complex and addressing economic globalization as a driver of local vulnerability risks overloading the concept of global adaptation governance.

“Planned adaptation” (E) is where adaptation actions are implemented. Indeed, most adaptations take place at the local or national level and provide distinct benefits that can be captured at these levels (e.g., healthy people, secured income streams and livelihoods, resilient infrastructure, and ecosystem services). Some planned adaptations, however, might provide global public goods (or avoid global public bads) where benefits are non-excludable and non-rivalrous, and therefore require coordinated responses at global or regional level. Examples include collective investment in plant-breeding research for agriculture, early warning systems for food security, development of transferable infrastructure technologies for coastal defense, underwriting of particular insurance markets, control of climate-sensitive infectious diseases, and modeling of climate impacts (W. N. Adger, 2001; Cimato & Mullan, 2010; Khan, 2016). In these cases, international cooperation within a global governance arrangement becomes a necessary response to secure global-level benefits, similar to how a mitigation agreement is seen to be necessary for reducing emissions and providing a stable climate as a global public good.

The picture is more complex, though, with variants of regional or club goods (Barrett, 2008). Multiple positive externalities, at both global and local scales, might mean that an actor chooses to adapt mainly based on the local benefits derived (Ostrom, 2010). Further, where do we draw the line what constitutes a global public good, for example, peace, security,

financial stability? Khan & Roberts (2013, p. 33) contend that “at some point supporting a series of local and national resilient societies becomes a global public good, measurably enhancing global harmony, peace and security.” The fact that some adaptations can provide global public goods is the most direct justification of strengthened global adaptation governance. So far, however, the UNFCCC process has not picked up the framing of adaptation as a global public good (Hall & Persson, 2017).

There are thus different ways of framing and scaling adaptation as a problem justifying global-level governance, which has meant that there is no conceptually tight narrative on adaptation as a “global challenge.” Overall, the combined literature suggests that the assumption that adaptation is *only* local needs to be refuted and the assumption that it is *mainly* local need to be further tested. In terms of understanding adaptation as a “global challenge” (Paris Agreement, Article 7.2), more research on the nature of transboundary and borderless climate risks and governance responses, as well as instances where adaptation provides global public goods, is needed to inform more effective and targeted global adaptation governance. When is it really critical, and when is it not?

4.3 | Weak governance as a consequence

Our working definition specifies that attempts to steer actions towards adaptation must be “intentional and authoritative.” Do existing governance efforts meet these criteria, or are they weak? An exhaustive analysis is beyond the scope of this study, but the question relates to the consequences of contestation. Bernstein and Cashore (2012) propose a typology of three forms of global governance for influencing domestic actors (market mechanisms not included here, but see Persson, 2011), which is useful for taking stock. First, *international rules* are the traditional form. As described, the UNFCCC regime has relied mainly on facilitative and “soft” forms of governance (Hall & Persson, 2017; Khan & Roberts, 2013; Lesnikowski et al., 2017), and rules have been rare for IGOs (Weitz & Persson, 2016) and transnational initiatives (Dzebo, 2019). When rules exist, procedural rather than substantial rules (i.e., how much and what kind of adaptation constituents should do) have been more common.

Second, *international norms and discourse* frame and regulate appropriate behavior. In the global adaptation governance domain, we find several examples of knowledge dissemination and sharing initiatives as one form of norm-setting and establishing a discourse: for example, the Nairobi Work Programme, Adaptation Committee, IPCC, transnational initiatives, World Adaptation Science Programme). However, more research is needed on the behavioral effects of these initiatives, including if they represent “discursive governance” (Bulkeley et al., 2014), that is, substantively shaping not only discourse but also action among constituents.

Third, global governance arrangements can influence behavior through *direct access to domestic policy-making processes*, for example, through funding and capacity-building efforts. This is a very common form in global adaptation governance, considering the importance of adaptation finance and the associated projectization of adaptation by institutions such as the Adaptation Fund, Global Environment Facility and the Green Climate Fund (Dzebo, 2019; Dzebo & Stripple, 2015). Again, more empirical research, preferably using experimental methodologies, is needed on the steering effect of funding criteria from the multilateral funds on adaptation practices on the ground. However, it can be assumed that these criteria have played a significant role in shaping actions by constituents, considering the central role of the multilateral funds in global adaptation governance.

Overall, governance efforts from the global level appear to have been intentional but not particularly authoritative, if we take the latter to imply binding rules. Although there could be multiple explanations behind this, I propose here that the contestation of adaptation as an unambiguous public goal and as a legitimate global-level governance challenge have significantly contributed to this outcome.

5 | CONCLUSION

In view of current scientific knowledge gaps and recent calls to accelerate climate change adaptation globally, this article has reviewed adaptation as a global governance domain. In light of the research questions and the literature reviewed here, I conclude that global governance of adaptation has indeed emerged since the 1990s, in some way crowned by the global goal on adaptation established by the Paris Agreement. However, while global adaptation governance efforts have *expanded*, they do not appear to so far have significantly *strengthened* this domain of governance. This trend of increasing but weak governance is contested in two ways. First, adaptation is still not an clear public goal, with ambiguities relating to whether adaptation is seen as a positive goal that global actors actively want to pursue through governance efforts, whether it needs a distinct governance domain or is rather a norm to be mainstreamed, the lack of agreed metrics for monitoring and accountability, and

unsettled and locally varying division of responsibility between the public and the private. Second, there is still uncertainty around under what circumstances and to what extent global-level governance of adaptation is required. Justifying global adaptation governance strongly or solely in terms of adaptation as a global public good seems less relevant in a post-Paris, bottom-up climate action world. Multi-level governance will be needed. However, there are two reasons for considering strengthened global governance: (a) transboundary and teleconnected climate risks, and associated interdependencies in adaptation and (b) situations where adaptation has clear global public good properties and need coordinated responses.

Reviewing this literature points to several research needs. This includes the need for theory-driven research to explain the nature of existing (or missing) global adaptation governance and possible future paths. This might include institutionalist approaches to examine similarities and dissimilarities with other global governance domains or interest-based analysis to understand actor preferences and strategies. More comparative research looking at other domains (e.g., health, trade) should be pursued. Considering the urgency to accelerate adaptation in light of impacts predicted already at limited warming (Intergovernmental Panel on Climate Change, 2018), three research needs are particularly important to ensure that science can inform policy: first, how to define, operationalize and institutionalize an adaptability norm across different global governance domains; second, how to ensure that the global stock-take and the global goal on adaptation under the UNFCCC become meaningful, well-informed and effective in governing further adaptation; and third, to analyze and catalogue climate impacts and adaptations that have global scale to facilitate a more nuanced understanding of when international and transnational cooperation is necessary and can be most effective.

CONFLICT OF INTEREST

The author has declared no conflicts of interest for this article.

AUTHOR CONTRIBUTIONS

A.P. is the lead for conceptualization, formal analysis, investigation, writing the original draft, and writing the review and editing this manuscript.

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ENDNOTES

- ¹ Note that global governance is often used as an all-encompassing term, that includes and aggregates all sub-global governance, or it is used synonymously with the term multilevel governance. In this article, however, I wish to draw attention to the under-researched *global* level specifically, which here includes both intergovernmental and transnational/hybrid governance efforts that involve actors from multiple regions.
- ² Searches performed on December 18, 2017 of “global adaptation governance” and “global governance of adaptation” as exact phrases in peer-reviewed publications published in 2000–2017 resulted in less than 10 hits on Google Scholar and Scopus, all of which are cited in this article.
- ³ See http://unfccc.int/adaptation/knowledge_resources/items/6994.php.
- ⁴ See <https://www.iso.org/standard/68508.html>.

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REFERENCES

- Abbott, K. W. (2012). The transnational regime complex for climate change. *Environment and Planning. C, Government & Policy*, 30(4), 571–590. <https://doi.org/10.1068/c11127>

- ActionAid, CARE, & WWF. (2016). Global goal on adaptation: From concept to practice. Retrieved from <http://careclimatechange.org/publications/global-goal-adaptation-concept-practice/>
- Adger, N., Arnell, N., & Tompkins, E. (2005). Successful adaptation across scales. *Global Environmental Change*, 15(2), 77–86.
- Adger, W. N. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development*, 13(7), 921–931. <https://doi.org/10.1002/jid.833>
- Adger, W. N., Quinn, T., Lorenzoni, I., Murphy, C., & Sweeney, J. (2013). Changing social contracts in climate-change adaptation. *Nature Climate Change*, 3(4), 330–333. <https://doi.org/10.1038/nclimate1751>
- Amerasinghe, N., Thwaites, J., Larsen, G., & Ballesteros, A. (2017). *The future of the funds: Exploring the architecture of multilateral climate finance*. Washington, DC: World Resources Institute Retrieved from http://www.wri.org/sites/default/files/The_Future_of_the_Funds_0.pdf
- Andonova, L. B., Betsill, M. M., & Bulkeley, H. (2009). Transnational climate governance. *Global Environmental Politics*, 9(2), 52–73.
- Andonova, L. B., Hale, T. N., & Roger, C. B. (2017). National policy and transnational governance of climate change: Substitutes or complements? *International Studies Quarterly*, 61(2), 253–268. <https://doi.org/10.1093/isq/sqx014>
- Ayers, J. M., & Huq, S. (2009). Supporting adaptation to climate change: What role for official development assistance? *Development and Policy Review*, 27(6), 675–692. <https://doi.org/10.1111/j.1467-7679.2009.00465.x>
- Bäckstrand, K. (2008). Accountability of networked climate governance: The rise of transnational climate partnerships. *Global Environmental Politics*, 8(3), 74–102.
- Bäckstrand, K., Kuyper, J. W., Linnér, B.-O., & Lövbrand, E. (2017). Non-state actors in global climate governance: From Copenhagen to Paris and beyond. *Environmental Politics*, 26(4), 561–579. <https://doi.org/10.1080/09644016.2017.1327485>
- Banda, M. L. (2018). Global adaptation law: Optimizing legal design for multi-level public goods after the Paris agreement. *Vanderbilt Journal of Transnational Law*, 51(4), 997–1026.
- Barrett, S. (2008). Climate treaties and the imperative of enforcement. *Oxford Review of Economic Policy*, 24(2), 239–258. <https://doi.org/10.1093/oxrep/grn015>
- Bassett, T. J., & Fogelman, C. (2013). Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum*, 48(Suppl. C), 42–53. <https://doi.org/10.1016/j.geoforum.2013.04.010>
- Benzie, M., Hedlund, J., & Carlsen, H. (2016). Introducing the transnational climate impacts index: Indicators of country-level exposure—Methodology report (Working Paper No. 2016-07). Stockholm, Sweden: SEI. Retrieved from <https://www.sei-international.org/publications>
- Benzie, M., & Persson, Å. (2019). Governing borderless climate risks: Moving beyond the territorial framing of adaptation. *International Environmental Agreements: Politics, Law and Economics*, 19(4–5), 369–393. <https://doi.org/10.1007/s10784-019-09441-y>
- Bernstein, S., & Cashore, B. (2012). Complex global governance and domestic policies: Four pathways of influence. *International Affairs*, 88(3), 585–604. <https://doi.org/10.1111/j.1468-2346.2012.01090.x>
- Biermann, F. (2005). Between the USA and the South: Strategic choices for European climate policy. *Climate Policy*, 5(3), 273–290. <https://doi.org/10.1080/14693062.2005.9685558>
- Biermann, F. (2014). *Earth system governance: World politics in the Anthropocene*. Cambridge, Massachusetts: MIT Press.
- Biermann, F., & Boas, I. (2010). Global adaptation governance: Setting the stage. In F. Biermann, P. Pattberg, & F. Zelli (Eds.), *Global climate governance beyond 2012: Architecture, agency and adaptation*. New York, NY: Cambridge University Press.
- Biermann, F., Pattberg, P., van Asselt, H., & Zelli, F. (2009). The fragmentation of global governance architectures: A framework for analysis. *Global Environmental Politics*, 9(4), 14–40.
- Biesbroek, G. R., Swart, R. J., Carter, T. R., Cowan, C., Henrichs, T., Mela, H., ... Rey, D. (2010). Europe adapts to climate change: Comparing national adaptation strategies. *Global Environmental Change*, 20(3), 440–450.
- Bird, N., Watson, C., & Schalatek, L. (2017). *The Global Climate Finance Architecture (Climate Funds Update)*. London, England: ODI and Heinrich Böll Stiftung.
- Birkmann, J., & von Teichman, K. (2010). Integrating disaster risk reduction and climate change adaptation: Key challenges—Scales, knowledge, and norms. *Sustainability Science*, 5(2), 171–184. <https://doi.org/10.1007/s11625-010-0108-y>
- Bodansky, D. (2016). The legal character of the Paris Agreement. *Review of European, Comparative & International Environmental Law*, 25(2), 142–150. <https://doi.org/10.1111/reel.12154>
- Bulkeley, H., Andonova, L., Betsill, M., Compagnon, D., Hale, T., Hoffman, M., ... Vandever, S. (2014). *Transnational climate change governance*. New York, NY: Cambridge University Press.
- Burton, I. (2011). Adaptation to climate change: Context, status, and prospects'. In J. D. Ford & L. Berrang-Ford (Eds.), *Climate change adaptation in developed nations* (Vol. 42, pp. 477–483). Dordrecht, the Netherlands: Springer. https://doi.org/10.1007/978-94-007-0567-8_35
- Challinor, A. J., Adger, W. N., & Benton, T. G. (2017). Climate risks across borders and scales. *Nature Climate Change*, 7(9), 621–623. <https://doi.org/10.1038/nclimate3380>
- Chan, S., & Amling, W. (2019). Does orchestration in the global climate action agenda effectively prioritize and mobilize transnational climate adaptation action? *International Environmental Agreements: Politics, Law and Economics*, 19(4–5), 429–446. <https://doi.org/10.1007/s10784-019-09444-9>
- Chan, S., Falkner, R., Goldberg, M., & van Asselt, H. (2016). Effective and geographically balanced? An output-based assessment of non-state climate actions. *Climate Policy*, 18(1), 24–35. <https://doi.org/10.1080/14693062.2016.1248343>
- Chan, S., van Asselt, H., Hale, T., Abbott, K. W., Beisheim, M., Hoffmann, M., ... Widerberg, O. (2015). Reinvigorating international climate policy: A comprehensive framework for effective nonstate action. *Global Policy*, 6(4), 466–473. <https://doi.org/10.1111/1758-5899.12294>

- Cimato, F., & Mullan, M. (2010). Adapting to climate change: Analysing the role of government. Defra Evidence and Analysis Series, Paper 1. January 2010. London, England: Department for Environment, Food and Rural Affairs (defra). Retrieved from <http://archive.defra.gov.uk/environment/climate/documents/analysing-role-government.pdf>
- Ciplet, D. (2015). Rethinking cooperation: Inequality and consent in international climate change politics. *Global Governance*, 21(2), 247–274.
- Ciplet, D., Roberts, J. T., & Khan, M. (2013). The politics of international climate adaptation funding: Justice and divisions in the greenhouse. *Global Environmental Politics*, 13(1), 49–68.
- Ciplet, D., Roberts, J. T., & Khan, M. R. (2015). *Power in a warming world*. Cambridge, MA: MIT Press Retrieved from <https://mitpress.mit.edu/books/power-warming-world>
- Corfee-Morlot, J., Cochran, I., Hallegatte, S., & Teasdale, P.-J. (2011). Multilevel risk governance and urban adaptation policy. *Climatic Change*, 104(1), 169–197. <https://doi.org/10.1007/s10584-010-9980-9>
- Dellmuth, L. M., Gustafsson, M.-T., Bremberg, N., & Mobjörk, M. (2018). Intergovernmental organizations and climate security: Advancing the research agenda. *WIREs Climate Change*, 9, e496. <https://doi.org/10.1002/wcc.496>
- Dimitrov, R. S. (2016). The Paris Agreement on climate change: Behind closed doors. *Global Environmental Politics*, 16(3), 1–11. https://doi.org/10.1162/GLEP_a_00361
- Dingwerth, K., & Pattberg, P. (2006). Global governance as a perspective on world politics. *Global Governance*, 12(2), 185–203.
- Dodman, D., & Mitlin, D. (2013). Challenges for community-based adaptation: Discovering the potential for transformation. *Journal of International Development*, 25(5), 640–659. <https://doi.org/10.1002/jid.1772>
- Dupuis, J. (2018). Climate change adaptation as a new global norm in the water sector? Between symbolism and dilution. In C. Bréthaut & R. Schweizer (Eds.), *A critical approach to international water management trends: Policy and practice* (pp. 177–200). London, England: Palgrave Macmillan.
- Dupuis, J., & Biesbroek, R. (2013). Comparing apples and oranges: The dependent variable problem in comparing and evaluating climate change adaptation policies. *Global Environmental Change*, 23(6), 1476–1487. <https://doi.org/10.1016/j.gloenvcha.2013.07.022>
- Dzebo, A. (2019). Effective governance of transnational adaptation initiatives. *International Environmental Agreements: Politics, Law and Economics*, 19(4–5), 447–466. <https://doi.org/10.1007/s10784-019-09445-8>
- Dzebo, A., & Strippel, J. (2015). Transnational adaptation governance: An emerging fourth era of adaptation. *Global Environmental Change*, 35, 423–435. <https://doi.org/10.1016/j.gloenvcha.2015.10.006>
- Ford, J. D., Berrang-Ford, L., Biesbroek, R., Araos, M., Austin, S. E., & Lesnikowski, A. (2015). Adaptation tracking for a post-2015 climate agreement. *Nature Climate Change*, 5(11), 967–969. <https://doi.org/10.1038/nclimate2744>
- Galaz, V., Tallberg, J., Boin, A., Ituarte-Lima, C., Hey, E., Olsson, P., & Westley, F. (2017). Global governance dimensions of globally networked risks: The state of the art in social science research. *Risk, Hazards & Crisis in Public Policy*, 8(1), 4–27. <https://doi.org/10.1002/rhc3.12108>
- Gillard, R., Gouldson, A., Paavola, J., & Van Alstine, J. (2016). Transformational responses to climate change: Beyond a systems perspective of social change in mitigation and adaptation. *WIREs Climate Change*, 7(2), 251–265. <https://doi.org/10.1002/wcc.384>
- Gupta, J., & van der Grijp, N. (Eds.). (2010). *Mainstreaming climate change in development cooperation: Theory, practice and implications for the European Union*. Cambridge, MA: Cambridge University Press.
- Hale, T., & Roger, C. (2014). Orchestration and transnational climate governance. *The Review of International Organizations*, 9(1), 59–82.
- Hall, N. (2016). *Displacement, development, and climate change: International organizations moving beyond their mandates*. Oxon and New York: Routledge.
- Hall, N. (2017). What is adaptation to climate change? Epistemic ambiguity in the climate finance system. *International Environmental Agreements: Politics, Law and Economics*, 17(1), 37–53. <https://doi.org/10.1007/s10784-016-9345-6>
- Hall, N., & Persson, Å. (2017). Global climate adaptation governance: Why is it not legally binding? *European Journal of International Relations*, 24(3), 540–566. <https://doi.org/10.1177/1354066117725157>
- Hallegatte, S. (2009). Strategies to adapt to an uncertain climate change. *Global Environmental Change*, 19(2), 240–247. <https://doi.org/10.1016/j.gloenvcha.2008.12.003>
- Hasson, R., Löfgren, Å., & Visser, M. (2010). Climate change in a public goods game: Investment decision in mitigation versus adaptation. *Ecological Economics*, 70(2), 331–338. <https://doi.org/10.1016/j.ecolecon.2010.09.004>
- Helgeson, J., & Ellis, J. (2015). The role of the 2015 Agreement in enhancing adaptation to climate change. Climate Change Expert Group Paper No. 2015(1). COM/ENV/EPOC/IEA/SLT(2015)1. Paris, France: OECD and IEA.
- Howlett, M., & Kemmerling, A. (2017). Calibrating climate change policies: The causes and consequences of sustained under-reaction. *Journal of Environmental Policy & Planning*, 19(6), 625–637. <https://doi.org/10.1080/1523908X.2017.1324772>
- Hulme, M. (2008). Geographical work at the boundaries of climate change. *Transactions of the Institute of British Geographers*, 33(1), 5–11. <https://doi.org/10.1111/j.1475-5661.2007.00289.x>
- Intergovernmental Panel on Climate Change. (2007). Summary for policymakers. In M. Parry, O. Canziani, J. Palutikof, P. van der Linden, & C. Hanson (Eds.), *Climate change 2007: Impacts, adaptation and vulnerability. Contribution of working group II to the fourth assessment report of the Intergovernmental Panel on Climate Change* (pp. 7–22). Cambridge, MA: Cambridge University Press.
- Intergovernmental Panel on Climate Change. (2014). In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, et al. (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change*. Cambridge, England/New York, NY: Cambridge University Press.

- Intergovernmental Panel on Climate Change. (2018). Summary for policymakers. In V. Masson-Delmotte, P. Zhai, & O. Portner (Eds.), *Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Geneva, Switzerland: World Meteorological Organization.
- Jordan, A. J., Huitema, D., Hildén, M., van Asselt, H., Rayner, T. J., Schoenefeld, J. J., ... Boasson, E. L. (2015). Emergence of polycentric climate governance and its future prospects. *Nature Climate Change*, 5(11), 977–982. <https://doi.org/10.1038/nclimate2725>
- Kates, R. W., Travis, W. R., & Wilbanks, T. J. (2012). Transformational adaptation when incremental adaptations to climate change are insufficient. *Proceedings of the National Academy of Sciences*, 109(19), 7156–7161. <https://doi.org/10.1073/pnas.1115521109>
- Keohane, R. O., & Victor, D. G. (2011). The regime complex for climate change. *Perspectives on Politics*, 9(1), 7–23. <https://doi.org/10.1017/S1537592710004068>
- Khan, M. R. (2016). Climate change, adaptation and international relations theory. In E. Atkins & G. Sosa-Nunez (Eds.), *Environment, climate change and international relations* (pp. 14–28). Bristol, England: E-International Relations Publishing.
- Khan, M. R. (2013). *Toward a binding climate change adaptation regime: A proposed framework* (1st ed.). London, New York: Routledge.
- Khan, M. R., & Roberts, J. T. (2013). Adaptation and international climate policy. *WIREs Climate Change*, 4(3), 171–189. <https://doi.org/10.1002/wcc.212>
- Kinley, R. (2017). Climate change after Paris: From turning point to transformation. *Climate Policy*, 17(1), 9–15. <https://doi.org/10.1080/14693062.2016.1191009>
- Klein, R. J. T., Midgley, G. F., Preston, B. L., Alam, M., Berkhout, F. G. H., Dow, K., & Shaw, M. R. (2014). Adaptation opportunities, constraints, and limits. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, et al. (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change* (pp. 899–943). Cambridge, England/New York, NY: Cambridge University Press.
- Lederer, M. (2015). Global governance. In K. Bäckstrand & E. Lövbrand (Eds.), *Research handbook on climate governance* (pp. 3–13). Cheltenham, England: Edward Elgar.
- Lesnikowski, A., Ford, J., Biesbroek, R., Berrang-Ford, L., Maillet, M., Araos, M., & Austin, S. E. (2017). What does the Paris Agreement mean for adaptation? *Climate Policy*, 17(7), 825–831. <https://doi.org/10.1080/14693062.2016.1248889>
- Liverman, D. (2015). U.S. national climate assessment gaps and research needs: Overview, the economy and the international context. *Climatic Change*, 135(1), 173–186. <https://doi.org/10.1007/s10584-015-1464-5>
- Mace, M. J. (2005). Funding for adaptation to climate change: UNFCCC and GEF developments since COP-7. *Review of European Community & International Environmental Law*, 14(3), 225–246. <https://doi.org/10.1111/j.1467-9388.2005.00445.x>
- Magnan, A. K., & Ribera, T. (2016). Global adaptation after Paris. *Science*, 352(6291), 1280–1282. <https://doi.org/10.1126/science.aaf5002>
- Massey, E., & Huitema, D. (2012). The emergence of climate change adaptation as a policy field: The case of England. *Regional Environmental Change*, 13(2), 341–352. <https://doi.org/10.1007/s10113-012-0341-2>
- Meerow, S., & Mitchell, C. L. (2017). Weathering the storm: The politics of urban climate change adaptation planning. *Environment and Planning A: Economy and Space*, 49(11), 2619–2627. <https://doi.org/10.1177/0308518X17735225>
- Mimura, N., Pulwarty, R. S., Duc, D. M., Elshinnawy, I., Redsteer, M. H., Huang, H.-Q., ... Rodriguez, R. A. S. (2014). Adaptation planning and implementation. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, et al. (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change* (pp. 869–898). Cambridge, England/New York, NY: Cambridge University Press.
- Moore, F. C. (2010). 'Doing adaptation': The construction of adaptive capacity and its function in the international climate negotiations. *St Antony's International Review*, 5(2), 66–88.
- Morrison, T. H., Adger, W. N., Brown, K., Lemos, M. C., Huitema, D., & Hughes, T. P. (2017). Mitigation and adaptation in polycentric systems: Sources of power in the pursuit of collective goals. *WIREs Climate Change*, 8(5), e479. <https://doi.org/10.1002/wcc.479>
- Moser, S. C., & Hart, J. A. F. (2015). The long arm of climate change: Societal teleconnections and the future of climate change impacts studies. *Climatic Change*, 129(1–2), 13–26. <https://doi.org/10.1007/s10584-015-1328-z>
- Nalau, J., Preston, B. L., & Maloney, M. C. (2015). Is adaptation a local responsibility? *Environmental Science & Policy*, 48(Suppl. C), 89–98. <https://doi.org/10.1016/j.envsci.2014.12.011>
- Ngwadla, X., & El-Bakri, S. (2016). The Global Goal for Adaptation under the Paris Agreement: Putting ideas into action. CDKN. Retrieved from <https://cdkn.org/wp-content/uploads/2016/11/Global-adaptation-goals-paper.pdf>
- Noble, I. R., Huq, S., Anokhin, Y. A., Carmin, J., Goudou, D., Lansigan, F. P., ... Villamizar, A. (2014). Adaptation needs and options. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, et al. (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change* (pp. 833–868). Cambridge, England/New York, NY: Cambridge University Press.
- O'Brien, K. L., & Leichenko, R. M. (2000). Double exposure: Assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change*, 10(3), 221–232. [https://doi.org/10.1016/S0959-3780\(00\)00021-2](https://doi.org/10.1016/S0959-3780(00)00021-2)
- Opitz Stapleton, S., Nadin, R., Watson, C., & Kellett, J. A. (2017). *Climate change, migration and displacement: The need for a risk-informed and coherent approach*. London, England: Overseas Development Institute.
- Organisation for Economic Co-operation and Development. (2015). *Climate change risks and adaptation: Linking policy and economics*. Paris, France: OECD Publishing. <https://doi.org/10.1787/9789264234611>
- Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, 20(4), 550–557. <https://doi.org/10.1016/j.gloenvcha.2010.07.004>

- Otto, C., Willner, S. N., Wenz, L., Frieler, K., & Levermann, A. (2017). Modeling loss-propagation in the global supply network: The dynamic agent-based model acclimate. *Journal of Economic Dynamics and Control*, 83(Suppl. C), 232–269. <https://doi.org/10.1016/j.jedc.2017.08.001>
- Pauw, W. P., Klein, R. J. T., Vellinga, P., & Biermann, F. (2016). Private finance for adaptation: Do private realities meet public ambitions? *Climatic Change*, 134(4), 489–503. <https://doi.org/10.1007/s10584-015-1539-3>
- Persson, Å. (2011). Institutionalising climate adaptation finance under the UNFCCC and beyond: Could an adaptation “market” emerge?. SEI Working Paper No. 2011-03, Stockholm Environment Institute, Stockholm.
- Persson, Å., & Klein, R. J. T. (2009). Mainstreaming adaptation to climate change in official development assistance: Challenges to foreign policy integration. In P. G. Harris (Ed.), *Climate change and foreign policy: Case studies from east to west* (pp. 162–177). London, England: Routledge.
- Persson, Å., & Remling, E. (2014). Equity and efficiency in adaptation finance: Initial experiences of the adaptation fund. *Climate Policy*, 14(4), 488–506. <https://doi.org/10.1080/14693062.2013.879514>
- Pickering, J., Betzold, C., & Skovgaard, J. (2017). Special issue: Managing fragmentation and complexity in the emerging system of international climate finance. *International Environmental Agreements: Politics, Law and Economics*, 17(1), 1–16. <https://doi.org/10.1007/s10784-016-9349-2>
- Pielke, R., Prins, G., Rayner, S., & Sarewitz, D. (2007). Climate change 2007: Lifting the taboo on adaptation. *Nature*, 445(7128), 597–598. <https://doi.org/10.1038/445597a>
- Rajamani, L. (2015). The devilish details: Key legal issues in the 2015 climate negotiations. *Modern Law Review*, 78(5), 826–853. <https://doi.org/10.1111/1468-2230.12145>
- Rajamani, L. (2016). Ambition and differentiation in the 2015 Paris Agreement: Interpretative possibilities and underlying politics. *International & Comparative Law Quarterly*, 65(2), 493–514. <https://doi.org/10.1017/S0020589316000130>
- Rosenau, J. N. (1995). Governance in the twenty-first century. *Global Governance*, 1, 13–43.
- Runhaar, H., Wilk, B., Persson, Å., Uittenbroek, C., & Wamsler, C. (2017). Mainstreaming climate adaptation: Taking stock about “what works” from empirical research worldwide. *Regional Environmental Change*, 18, 1–10. <https://doi.org/10.1007/s10113-017-1259-5>
- Schipper, E. L. F. (2006). Conceptual history of adaptation in the UNFCCC process. *Review of European Community & International Environmental Law*, 15(1), 82–92. <https://doi.org/10.1111/j.1467-9388.2006.00501.x>
- Schipper, E. L. F., Thomalla, F., Vulturius, G., Davis, M., & Johnson, K. (2016). Linking disaster risk reduction, climate change and development. *International Journal of Disaster Resilience in the Built Environment*, 7(2), 216–228. <https://doi.org/10.1108/IJDRBE-03-2015-0014>
- Sharma, A. (2017). Precaution and post-caution in the Paris Agreement: Adaptation, loss and damage and finance. *Climate Policy*, 17(1), 33–47. <https://doi.org/10.1080/14693062.2016.1213697>
- Smit, B., & Pilifosova, O. (2001). Adaptation to climate change in the context of sustainable development and equity. In J. J. McCarthy, O. F. Canziani, N. Leary, D. J. Dokken, & K. S. White (Eds.), *Climate change 2001: Impacts, adaptation and vulnerability: Contribution of working group II to the third assessment report of the Intergovernmental Panel on Climate Change* (pp. 877–912). Cambridge, England: Cambridge University Press Retrieved from http://www.grida.no/climate/ipcc_tar/wg2/pdf/wg2TARchap18.pdf
- Sovacool, B. K., & Linnér, B.-O. (2016). *The political economy of climate change adaptation*. New York, NY: Palgrave Macmillan.
- Stadelmann, M., Roberts, J. T., & Michaelowa, A. (2011). New and additional to what? Assessing options for baselines to assess climate finance pledges. *Climate and Development*, 3(3), 175–192. <https://doi.org/10.1080/17565529.2011.599550>
- Stern, N. (2007). *Stern review on the economics of climate change*. London, England: HM Treasury.
- Surminski, S. (2013, October 29). Private-sector adaptation to climate risk [Comments and Opinion]. <https://doi.org/10.1038/nclimate2040>
- UN Climate Change Secretariat. (2017). *Yearbook of global climate action 2017: Marrakech partnership*. Bonn, Germany: UN Climate Change Secretariat.
- United Nations Environment Programme. (2014). *Adaptation gap report 2014*. Nairobi, Kenya: UNEP.
- United Nations Environment Programme. (2016). The adaptation finance gap report 2016. Nairobi, Kenya: UNEP. Retrieved from <http://web.unep.org/adaptationgapreport/sites/unep.org.adaptationgapreport/files/documents/agr2016.pdf>
- United Nations Environment Programme. (2017). The adaptation gap report 2017. Nairobi, Kenya: UNEP.
- United Nations Framework Convention on Climate Change. (2016). Aggregate effect of the intended nationally determined contributions: An update. FCCC/CP/2016/2. Retrieved from <http://unfccc.int/resource/docs/2016/cop22/eng/02.pdf>
- United Nations Framework Convention on Climate Change. (2017). Recommendations of the Adaptation Committee and the Least Developed Countries Expert Group for addressing decision 1/CP.21 paragraph 41, and, in collaboration with the Standing Committee on Finance, decision 1/CP.21, paragraph 45. FCCC/SB/2017/2/Add.1-FCCC/SBI/2017/14/Add.1. Retrieved from <http://unfccc.int/resource/docs/2017/sb/eng/02a01e.pdf>
- Verheyen, R. (2002). Adaptation to the impacts of anthropogenic climate change—The international legal framework. *Review of European Community & International Environmental Law*, 11(2), 129–143.
- Weiler, F., Klöck, C., & Dornan, M. (2018). Vulnerability, good governance, or donor interests? The allocation of aid for climate change adaptation. *World Development*, 104, 65–77. <https://doi.org/10.1016/j.worlddev.2017.11.001>
- Weiss, T. G., & Thakur, R. (2010). *Global governance and the UN: An unfinished journey*. Bloomington, Indiana: Indiana University Press.
- Weiss, T. G., & Wilkinson, R. (2014). Rethinking global governance? Complexity, authority, power, change. *International Studies Quarterly*, 58(1), 207–215. <https://doi.org/10.1111/isqu.12082>
- Weitz, N., & Persson, Å. (2016). Mapping the global governance of climate change adaptation. Paper presented at the Earth System Governance Conference, Nairobi, December 8–10, 2016.

- Widerberg, O., & Pattberg, P. (2015). International cooperative initiatives in global climate governance: Raising the ambition level or delegitimizing the UNFCCC? *Global Policy*, 6(1), 45–56. <https://doi.org/10.1111/1758-5899.12184>
- Widerberg, O., & Pattberg, P. (2017). Accountability challenges in the transnational regime complex for climate change. *Review of Policy Research*, 34(1), 68–87. <https://doi.org/10.1111/ropr.12217>
- Widerberg, O., & Stripple, J. (2016). The expanding field of cooperative initiatives for decarbonization: A review of five databases. *WIREs Climate Change*, 7(4), 486–500. <https://doi.org/10.1002/wcc.396>

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