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Global climate adaptation governance: what is governed and why?

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Abstract

In the last decade there has been a significant shift in the framing of climate governance. The UN Framework Convention on Climate Change (UNFCCC) has moved from an explicit focus on mitigation, to also include adaptation. Climate change is no longer simply about reducing emissions but also about enabling countries to deal with its impacts – be it on development, migration, or health. Yet most studies of the climate regime have focused on the evolution of mitigation governance, not adaptation. This tendency is partly because adaptation was considered a ‘taboo’ topic in the UNFCCC as many states did not want to concede that climate change was occurring, or did not want it to be considered a substitute for mitigation. In short, global adaptation governance is understudied and poorly conceptualized.

In this paper, we ask: what constitutes and characterizes global adaptation governance? We attempt to characterize governance efforts in terms of what, who and how adaptation is governed. We examine: the constituent parts of an emerging regime (principles, norms, rules, decision-making procedures), the institutions involved, and how these parts have been manifested in concrete modes of governance (standards and commitments, operations, finance, knowledge and networking). To aid this mapping, we use the mitigation regime as a heuristic for comparison. We find that there is indeed an emerging global regime around adaptation, although **characterized by ‘soft’ procedural and facilitative modes of governance**. Furthermore the institutional complexity and fragmentation we see in global adaptation governance arises for different reasons than for the mitigation regime. Namely the epistemic ambiguity around adaptation, including its scalar framing, and the power politics around controlling donor funds for adaptation. This paper contributes to our understanding of the shift in framing of global climate governance, from mitigation to adaptation, and the coherence of this regime.

Keywords: global governance; climate change; adaptation;

Introduction

In the first decade of global climate governance, formalized in 1992 with the United Nations Framework Convention on Climate Change (UNFCCC), climate change adaptation was considered a ‘taboo’ topic (Pielke et al. 2007), or the ‘overlooked cousin’ of mitigation (Schipper 2006). It was seen as offering an immoral substitute to taking mitigation action, or as a secondary step to achieving ambitious mitigation commitments. Since the early 2000s, however, the issue of adaptation has gradually but firmly ascended on the negotiation agenda and international climate politics at large (Khan 2013; Khan and Roberts 2013; Biermann 2014; Ciplet, Roberts, and Khan 2013; Helgeson and Ellis 2015; Sovacool and Linnér 2016). This rise of adaptation has been explained in terms of the increasing evidence of actual or unavoidable climate impacts and urgency for action regardless of mitigation commitments, as well as successful strategies of vulnerable developing countries to increase their political weight in climate negotiations. Today, the evidence base on the need for adaptation ranges from on-the-ground observations, with communities around the world witnessing change, through to top-down global economic modelling of impact and adaptation costs of billions of dollars (see e.g., OECD 2015a; Burke, Hsiang, and Miguel 2015). Together with increased knowledge about climate impacts and adaptation needs, the practice and multi-level governance of adaptation has advanced quickly, with a wealth of planning tools and concrete measures available to decision-makers and an established epistemic community (IPCC 2014).

While the rise of adaptation and its milestones in the UNFCCC negotiations have been well documented (see e.g., (Khan 2013; Helgeson and Ellis 2015), there is a lack of analytical studies evaluating whether we can now speak of an ‘international regime’ or ‘global governance’ around adaptation, and if so, what are its constituent parts and what shaped it. At least three strands of literature help provide a partial analysis, but fail to offer a full answer – something this paper attempts to do.

First, the increasing literature on international adaptation politics, with a few recent exceptions, largely or exclusively focus on adaptation finance and how it can and should be governed, allocated, and generated (Stadelmann, Roberts, and Michaelowa 2011; Ciplet, Roberts, and Khan 2013; Bodnar, Brown, and Nakhouda 2015; Dzebo and Stripple 2015). Arguably, financial transfers represent a very important mode of governing adaptation practices on the ground from an international level, but not the only one. Is there a more comprehensive regime, and if so, what are other constituent parts than commitments on finance?

Second, while ‘adaptation governance’ has steadily emerged as a research field, it has to a large extent focused on local or national levels of governance, and associated modes and actors (Adger 2001; Biesbroek et al. 2010; Massey and Huitema 2012; Mimura et al. 2014; OECD 2015a). This reflects the scalar framing of adaptation as an individual, local, or at most national, concern, yielding mainly private, local or national benefits (see e.g. Barrett 2008; Persson 2011).

Third, the recent and large literature on international/global climate governance – studying climate change as a regime complex (Keohane and Victor 2011), as transnational governance (Andonova, Betsill, and Bulkeley 2009; Bulkeley et al. 2014), as polycentric governance (Jordan et al. 2015) and as characterized by institutional complexity (Zelli and van Asselt 2013) – has almost exclusively focused on mitigation and not adaptation. As an example, the database of ‘transnational climate governance initiatives’ compiled by Bulkeley et al. (2014) includes only two adaptation-related initiatives out of a total of 60.

This leaves a knowledge gap which this paper will address. It should be emphasized that we do not argue that mitigation and adaptation necessarily *should* be conceived as two separate regimes (complexes). However, at this point in time and given the knowledge gaps, it is timely to focus special attention on the adaptation dimension of climate governance.

Adding to this empirical gap, it is also timely to take stock and analyse the possible regime and governance architecture considering various normative calls. Ahead of the post-2012 negotiations, Biermann and Boas (2010) called for more research on ‘global adaptation governance’. They proposed that “global adaptation governance will affect most areas of world politics” (p. 223) and their core institutions, such as food, water, health, energy, migration, and economic governance. A similar perspective has been voiced by the UN Secretary General, in that there is not a single organization in the UN responsible for adaptation and all UN organizations should be working on it. In contrast with this approach that essentially welcomes ‘mainstreaming’ of responsibilities and resulting institutional complexity, Khan (2013) makes a strong case for stronger and more centralized global governance, in particular more binding agreements on adaptation within the UNFCCC climate regime. His argument rests on ethics and equity principles (polluter-pays), but also recognizes that the scalar framing of adaptation as a mainly local concern is in need of reconsideration.

In a similar vein, Magnan, Ribera, and Treyer (2015) argue that a global goal framework for adaptation is now warranted, to ensure that globally concerted adaptation efforts will ‘add up’. Underlying their argument, is the idea that there should be ‘parallelism’ between mitigation and adaptation (see also Helgeson and Ellis 2015), i.e. that adaptation and mitigation should be balanced in terms of political weight and that adaptation could mimic the current governance approach towards mitigation with a global goal, national commitments, and a tracking system. This argument echoes earlier calls to adopt a specific Adaptation Protocol, on par with the Kyoto Protocol (Verheyen 2002; Schipper 2006). Other proposals have been made arguing that the adaptation issue should be removed from the UNFCCC altogether and placed within more development-oriented UN institutions, and framed as ‘climate-resilient development’. In particular, in the early 2000s the development community was actively getting to grips with how to mainstream adaptation and adaptive capacity.

Against this backdrop, we ask can we speak of global adaptation governance and the formation of an international regime? If so, what aspects of adaptation are governed and not? To what extent is it characterized by institutional complexity and fragmentation? And what explains the current shape of global adaptation governance? To answer these questions we examine what, who and how adaptation is governed and use the mitigation regime as a heuristic for comparison. We examine the constituent parts of the emerging adaptation regime, the institutions involved, and the concrete modes of governance (standards and commitments, operations, finance, knowledge and networking). We find that there are indeed principles, norms, rules and decision-making procedures under the UNFCCC that collectively constitute an international adaptation regime, however these elements have so far largely been of a procedural rather than substantive nature. In addition, the problem structure, the epistemic ambiguity, and the power politics of framing adaptation have led to the ongoing fragmentation of the adaptation regime, as well as the tendency to agree on mainly procedural modes of governance. This paper contributes to our understanding of why regimes become fragmented and how adaptation is globally governed.

To answer these questions, we use a two-step methodology. First, we do a functional analysis of the constituent parts of the adaptation regime as espoused under the UNFCCC solely. Such an analysis is not available in existing literature, hence it constitute a first necessary step. Second, we start outlining a mapping of the wider regime complex, or governance architecture, around climate adaptation at the global level. As a next step beyond this paper, such a mapping exercise is intended to facilitate an analysis of the degree, causes and consequences of fragmentation. The data feeding into these two stages of mapping are based on analysis of UNFCCC documents, website searches, available databases and literature on climate governance initiatives and institutions, and participant observation at climate negotiations and other meetings involving some of the key international organizations in this field.

In this paper, we first review existing conceptions of international regimes, governance modes and regime fragmentation. In the following section, we propose an analytical framework to identify elements of a global adaptation regime, and then apply it to the UNFCCC. After a discussion of the regime characteristics, we discuss approaches and questions for further analysis of a global adaptation regime complex and its degree, causes and consequences of fragmentation. Then follows a discussion of possible explanations to the current state of global adaptation governance, with a few tentative concluding remarks.

Theoretical background: regimes, governance, fragmentation

To analyse global adaptation governance, we draw on existing concepts and theory on regimes, governance, institutional complexity and fragmentation. It is useful here to depart from Biermann et al. (2009 p. 15) definition of ‘global governance architecture’: “the overarching system of public and private institutions that are valid or active in a given issue area of world politics. This system comprises organizations, regimes, and other forms of principles, norms, regulations, and decision-making procedures”. Focusing in on regimes, they have been defined as “implicit or explicit principles, norms, rules and decision-making procedures around which actors’ expectations converge in a given area of international relations” (Krasner 1983). Scholars have noted how regimes vary, over time or across cases, in terms of their centralization, complexity, and/or fragmentation (Biermann et al. 2009; Keohane and Victor 2011; Zelli 2011; Zelli and van Asselt 2013).

We could add in here other dimensions of governance – ie procedural vs substantive; hard vs soft law (see Snidal)

For an international regime to be robust, we expect to see convergence, or tight coupling, across the four constituent elements that define a regime and shape regime members’ expectations and behavior: its principles, norms, rules, and decision-making procedures (Krasner 1983). A *comprehensive regime* occurs when the "interests of essentially all the most powerful actors are sufficiently similar, across a broad issue-area, that they 'demand' international institutions as ways to achieve their objectives through reducing contracting costs, providing focal points, enhancing information, and therefore credibility and monitoring compliance" (Keohane and Victor 2011 pp. 8-9). Hence, when identifying a potential new or emerging regime, such as one addressing climate change adaptation, we would look for convergence on principles, norms, rules and decision-making procedures relating to this new issue-area.

In order to understand how a regime presumably governs the decisions and behaviour of actors, including at sub-global level, there is a need to clarify the notion of governance. We here use the definition of Bulkeley et al. (2014 p. 14) that governance “involves authoritative attempts to shape the actions of constituents towards some form of public purpose”. Further, Andonova, Betsill, and Bulkeley (2009) identify the following common features of the multiple definitions of (global) governance: i) it is concerned with realizing public goals, ii) it involves a process of steering a particular constituency of actors, and iii) it is regarded as authoritative.

Regarding the second and third qualification, instances of steering is what will be empirically analysed below, but it is fair to expect that steering will be less explicit, formal and binding for adaptation than mitigation. Here, it is useful to consider not just governance as rule-setting but also the bigger ‘grey area’ of norm-setting and norm diffusion. Importantly, governance can also involve “more discursive and normalizing practices whereby the exchange of knowledge, ideas and beliefs are also a critical means through which transnational governance has effect” (Bulkeley et al. 2014 p. 13).

Drawing on public policy literature to further understand the act of ‘steering’, Howlett (2000) has made a useful distinction between procedural and substantive instruments. His analysis has been developed primarily for national-level policy-making, but can also inform analysis of the practice of global governance and modes of governance employed within regimes. ‘Substantive instruments’ refer to traditional instruments such as regulations, taxes and subsidies. With the ‘hollowing-out’ and loss of autonomy of the state and associated loss of legitimacy and trust, “the subject of political conflict often shifts from the actual substantive content of government actions towards a critique of the processes by which those actions are determined” (p. 422). Hence, ‘procedural instruments’ emerge which “indirectly affect outcomes through the manipulation of policy processes” (p. 413), more specifically the relationships among actors involved. Procedural instruments include education, training, institution creation, formal evaluations, etc.

In this way, both Bulkeley et al. (2014) and Howlett's (2000) accounts provide a more nuanced analysis of alternative and more indirect modes or functions of governance that can be employed within regimes, as a complement to traditional, substantive rules regulating regime actors.

Going back to the architecture of global governance and regimes, it has been suggested that, in reality, strong convergence is often elusive. Many scholars have observed the frequency of regime complexes or “loosely coupled sets of regimes” (Keohane and Victor 2011). A regime complex occurs “[w]hen patterns of interests (shaped by beliefs, constrained by information and weighted by power) diverge to a greater or lesser extent, major actors may prefer a regime complex to any feasible comprehensive, highly integrated, institution” (Keohane and Victor 2011 p. 4). Regimes may also become more complex over time as fragmentation, a common feature in international relations, occurs.

Fragmentation exists when there are a “patchwork of international institutions that are different in their character (organizations, regimes and implicit norms), their constituencies (public and private), their spatial scope (from bilateral to global), and their [predominant] subject matter” (Biermann et al. 2009 p. 16). Essentially, fragmentation means the regime’s constituent elements are not fully linked or integrated (ibid. p. 17) and the principles, norms, decision-making procedures and actors’ interests may be disconnected or conflict. Regime fragmentation occurs along a spectrum from synergistic regimes (highly

integrated institutions in which core norms align) to conflictive regimes (where there are loosely integrated institutions with different member states, different interests and core norms conflict).

So how do we identify when a regime has become fragmented? Following on from Bierman et. al (2009) we would expect to see: institutions that have different core issue-areas, spatial scope (national, bilateral and/or global), constituencies and character governing adaptation. It is the intention to develop an empirically grounded analysis of fragmentation in the global adaptation regime complex as a next step for the research presented in this paper.

It should be emphasised that fragmentation is not inherently a problem. Decentralisation and differentiated institutions may enable systems to be more adaptive to local needs (Keohane and Victor 2011; Ramalingam 2013), a point strongly argued also in the literature on polycentric governance (Ostrom 2010; Jordan et al. 2015). States can also forum-shop between the institutions that best serve their interests. Furthermore fragmentation may not always make it difficult to turn ideas into action, especially if such action does require extensive coordination between different entities. Fragmentation may even foster effective action by giving agents maximum autonomy to translate norms into appropriate operating rules.

One important limitation of the existing literature is that it does not examine variation across institutions in their authority, or modes of governance. In other words, the regime complexity and fragmentation literature tends to map out all the various institutions involved but not examine how comparatively powerful they are, and what role they play in governing the issue-area (Victor and Keohane 2011). Yet as we know institutions have very different levels of authority and play different roles, even in a regime complex where there is no set hierarchy.

Analysing Global Adaptation Governance

Applying these concepts and theory, what can we learn about the current state of global adaptation governance? Briefly, the notion of climate change adaptation was originally picked up by the Intergovernmental Negotiating Committee (INC) when developing the UNFCCC text in 1991, despite being contested through its origins in evolution theory (Schipper and Burton 2009). It was quickly framed as part of a dichotomy, adaptation vs. mitigation, which was reproduced both in scientific and policy debates. According to (Schipper 2006), it was “not without reason” that early climate change policy became synonymous with mitigation policy, considering the original framing of these two as substitutes and mitigation as the more preventative and urgent option.

As we shall see below, adaptation has not yet been defined under the UNFCCC, but the IPCC definition is frequently referred to and is used as a working definition also in this paper: *“The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate*

adjustment to expected climate and its effects.” (IPCC 2014) p. 1758).¹ While conceptually clear, trying to operationalize this definition into specific activities reveals how broadly applicable it is. As argued by (Shardul and Samuel 2008 p. 77): “[a]daptation is a rather nebulous concept, whose boundaries have not yet been clearly defined”. Ford et al. (2015 p. 967) further observe that there is still much debate over what counts as ‘adaptation’, “arising from the indistinctiveness of the concept, lack of clarity in its usage and continuous rebranding of policies as ‘adaptation’”. Despite this long-standing epistemic ambiguity, there is arguably a tacit understanding of what adaptation means in practice emerging that is being codified in key synthesis analysis (IPCC 2014; UNEP 2014) and practical guidance material (UNEP 2014; OECD 2015a). Against this background, we now turn to the question whether there is an adaptation regime.

Conceptualizing and Identifying the Global Adaptation Regime under the UNFCCC

The evolution of adaptation within the UNFCCC is well described (Schipper 2006; Khan 2013; Khan and Roberts 2013; Sovacool and Linnér 2016; Helgeson and Ellis 2015), but existing literature has not focused on identifying its constituent parts. We examine if there is an adaptation regime by examining the principles, norms, rules and decision-making procedures which globally govern adaptation (and all emanate from the UNFCCC). To operationalize this broad definition of a regime we set out eleven indicators on what a global governance regime could hypothetically encompass, together with their presumed steering effects. These are listed in the table below in the first column and include indicators such as decisions, norms or rules: justifying why there is a need for governance of the issue-area through to reporting mechanisms for actions taken. For illustrative purposes, we compare the constituent parts of the current the adaptation regime with the mitigation regime, where what is governed is often taken for granted.

Table 1: Identifying constituent parts of an international regime on climate adaptation under the UNFCCC

Principles, norms, rules and decision-making procedures regarding...	Steering effect	Key adaptation provisions, decisions and institutions	<i>For reference: Key mitigation provisions, decisions and institutions</i>
I. Objective and rationale for cooperation	Legitimising subsequent principles, norms, rules and decision-making procedures that govern the behaviour of Parties	<ul style="list-style-type: none"> • Not an objective under UNFCCC • Bali Action plan (2007) • Cancun Adaptation Framework (2010) 	<ul style="list-style-type: none"> • UNFCCC Article 2 “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system” (1992)
II. Operational/technical definition	Delimiting and specifying what activities can be governed under the regime	<ul style="list-style-type: none"> • No definition agreed • IPCC definition referred to 	<ul style="list-style-type: none"> • UNFCCC Article 1 (emissions, GHGs, sources, sinks) • KP elaborates on categories of mitigation activities
III. A metric for monitoring implementation and evaluating success	Metrics steering selection of activities to ensure favourable	<ul style="list-style-type: none"> • No metric agreed 	<ul style="list-style-type: none"> • Tonnes of CO2 eq or C

¹ Note that adaptation has in the latest and previous IPCC reports been further categorised along a number of spectra or dichotomies: whether it is incremental or transformative; public or private; planned or autonomous; human systems or natural systems; anticipatory or reactive.

	performance		
IV. A measurable collective target	Specifying the collective level of ambition for Parties to consider	<ul style="list-style-type: none"> No target <i>Pre-COP21 proposals for global goal</i> 	<ul style="list-style-type: none"> 2 degrees C target agreed in Cancun Agreements (2010)
V. Individual commitments/obligations	Specifying the level of ambition for individual Parties	<ul style="list-style-type: none"> No obligations or commitments 	<ul style="list-style-type: none"> KP legally binding QELROs INDCs (2014) NAZCA registry (non-state actors)
VI. Planning: commitment and procedures/guidance	Agenda-setting, framing and normalizing function	<ul style="list-style-type: none"> UNFCCC Article 4 NAPAs (2001) NAPs (2010) Undertakings in adaptation planning as part of INDC (1/CP.20, para 12) (2015) Supporting institutions: Adaptation Committee; LDC Expert Group 	<ul style="list-style-type: none"> National Communications INDCs <i>Other?</i>
VII. Guidance and information exchange on good practice	Agenda-setting, framing and normalizing function	<ul style="list-style-type: none"> Nairobi Work Programme Adaptation Committee Adaptation Exchange 14 databases 	<ul style="list-style-type: none"> GHG data interface REDD Web Platform IPCC guidance on national GHG inventories Portal on cooperative initiatives Etc.
VIII. Reporting on actions taken	Reporting requirements steering selection of activities	<ul style="list-style-type: none"> National Communications NDCs Undertakings on adaptation planning (1/CP.20) 	<ul style="list-style-type: none"> National Communications National GHG inventories Biennial reports
IX. Obligations/voluntary commitments to provide financial support	Steers use of public resources of donors and resource availability for public investments for recipients	<ul style="list-style-type: none"> Article 4.4 Copenhagen Accord (2009) Standing Committee 	<ul style="list-style-type: none"> Article 4.4 Copenhagen Accord (2009) Standing Committee
X. Means and channels of delivery of financial support	Steers who can make funding allocation and based on what criteria	<ul style="list-style-type: none"> LDCF, SSCF AF GCF Article 11.5 allowing ODA 	<ul style="list-style-type: none"> LDCF, SSCF GCF
XI. Activities eligible and prioritized for receiving financial support	Steers the design of projects and activities	<ul style="list-style-type: none"> LDCF, SSCF AF GCF 	<ul style="list-style-type: none"> LDCF, SSCF GCF

Sources: www.unfccc.int and other websites; (Verheyen 2002; Khan 2013; Helgeson and Ellis 2015; Å. Persson et al. 2009). And mention it's compiled by the authors (ie you ☺)?

What rules, principles, norms and decision-making procedures does it comprise and what has not been addressed so far? How have they influenced Parties to do adaptation, how much to do it and how? Let's take each indicator in turn.

Regarding signals whether adaptation is important to pursue at all and to pursue jointly, adaptation would need to be considered a **fundamental objective (I)**, as a premise for and way of legitimizing the subsequent imposition of norms, principles, rules and decision-making procedures on adaptation to be undertaken. However, it was not strongly or explicitly expressed as a fundamental objective from the outset. In contrast, mitigation was identified in the objective (Article 2) of the UNFCCC: “*stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*”. The ‘demand’ for an international institution (cf. Keohane and Victor 2011) was thus not premised on the joint interest in and benefits from tackling adaptation together. Although the need to support vulnerable developing countries in their adaptation to adverse effects was certainly recognised both in other provisions of the Convention (particularly principles set out in Article 4) and in other agreements (Schipper 2006; Sovacool and Linnér 2016), a milestone for making adaptation a fundamental objective was not reached until 2007. The 2007 Bali Action Plan stated that a future agreement should address “*...enhanced action on adaptation*” (Decision 1/CP.13, Art. 1c). This statement of intent for international cooperation meant a clearer rationale for concerted action and, as a result, expanded governance activities. The 2010 Cancun Adaptation Framework further strengthened adaptation as a core objective and invited all Parties to undertake “*..planning, prioritizing and implementing adaptation actions...*” (Decision 1/CP.16, Article 14(a)). It remains to be seen whether a COP21 Paris agreement will identify adaptation as a key purpose of cooperation, but negotiating texts have indicated stronger statements such as ‘states shall/agree to take urgent action... to increase their ability to adapt’².

There is no **operational or technical definition (II)** of adaptation in the UNFCCC, in Article 1 (Definitions) or elsewhere. Subsequent decisions and initiatives under the Convention have generally referred to IPCC definitions (Moore 2010). It was defined in the first IPCC assessment report in 1990 as “measures to reduce the impact of global climate change” (IPCC 1990 p. 58). Note this was a very technical conception, not recognizing human agency or the temporal dimension of decision-making. Then, over a decade later, in the third IPCC report, adaptation was redefined more broadly to be any “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC 2001). The latest 2014 IPCC report modified the definition slightly (see above). The absence of a UNFCCC definition, together with the indistinctiveness and nebulousness of the IPCC definition (see above), has meant that a legal framework for adaptation, which imply obligations and relationships of accountability set out, is difficult to construct (Verheyen 2002). There has been little steering effect in the sense of specifying activities and behaviours that Parties need to commit to change. For mitigation, on the other hand, key terms such as ‘emissions’, ‘greenhouse gases’, ‘sources’ and ‘sinks’ were defined from the outset in 1992. This means that consensus and convergence among actors on what to be governed and what rules and norms to develop was much easier to agree.

² See “Draft agreement and draft decision on workstreams 1 and 2 of the Ad Hoc Working Group on the Durban Platform for Enhanced Action” <http://unfccc.int/files/bodies/application/pdf/ws1and2@2330.pdf>

Linked to a clear definition, is the question of an **agreed metric (III)** to evaluate progress on jointly agreed targets and/or commitments (see more below). Hypothetically, a metric – like tonnes of CO₂ eq emission reductions – could govern the behavior of states and other actors as they design and implement adaptation actions. For example, if it referred to number of lives saved, adaptation efforts at national and sub-national level might be directed towards disaster risk reduction (DRR) or health activities. If it referred to economic savings on crops or infrastructure saved from climate impacts in dollar terms, adaptation efforts might be targeted towards R&D and technology diffusion. However, as of 2015, no such metrics or basket of metrics have been agreed. For mitigation, the metrics of CO₂ eq. and tonnes of carbon have been used in a consensus manner under the Kyoto Protocol, facilitated by technical and methodological support from the IPCC.

There has been a strong focus on monitoring and evaluation in the adaptation field recently (Stadelmann et al. 2011; OECD 2015b), including under the UNFCCC Adaptation Committee. Ford et al. (2015) argue there needs to be global-scale adaptation tracking, in order to meaningfully track commitments to facilitate adaptation under a post-2015 agreement. Adaptation tracking is defined as “systematically identify, characterize and compare adaptation across nations and over time” (p. 967). Claiming that conceptual, methodological and empirical challenges are not insurmountable, they still do not propose a fast way forward. UNEP has tried to mimic the ‘emissions gap’ approach for adaptation, by identifying the global ‘adaptation gap’ (UNEP 2014). However, they managed to estimate only one of the three adaptation-related gaps identified, the funding gap, and not the knowledge and technology gaps.

Without a clear metric, it is difficult to see how the UNFCCC or another institution could meaningfully try to govern the overall ‘quantity’ or level of adaptation the world engages in, by setting a **measurable collective target (IV)**. This would hypothetically steer Parties by indicating the level of ambition with which to adapt. In the lead up to Paris, discussions have been ongoing on the potential for a global goal on adaptation (see Magnan, Ribera, and Treyer 2015), which could theoretically function similar to the 2 degrees target formally adopted in 2010 on the mitigation side (which has by other institutions and in technical reports been translated to a carbon budget, that in turn can be subdivided among countries and cross-checked with their actual commitments). Some vulnerable countries (e.g., the African Group) and civil society have been proposing this. It has been questioned whether it can be meaningfully designed, in terms of substantive outcomes (e.g., millions of lives saved from climate change disasters; economic savings from preventing climate change-related losses), mainly due to the lack of agreed metrics (Levina 2007). As an alternative, it has been suggested that the goal should refer to provision and use of international finance, or provide a qualitative statement on the need to ensure climate resilience. Magnan, Ribera, and Treyer (2015) argue that the benefit of a global adaptation goal framework would mainly be raising the political profile of adaptation globally, which could in turn facilitate and catalyse national-level action. Secondary, a goal would also facilitate tracking of adaptation – whether through quantitative metrics or other means – to assess whether we are on track to avoid negative effects of non-adaptation at the regional and global scales.

A measurable global goal would be a prerequisite for setting **individual obligations or commitments (V)** for countries, at least with a top-down burden-sharing approach. With a bottom-up approach based on voluntary pledges, it would not be necessary in principle. However, comparing with the mitigation side, a measurable goal has proven necessary to assess if national pledges together are ‘ambitious’ enough. On

the mitigation side, individual obligations and commitments were first set in the 1997 Kyoto Protocol, with binding quantified emissions limit or reduction objective (QELRO). Following the Copenhagen Accord, voluntary pledges were made. This practice has continued ahead of the COP21 negotiations, with voluntary pledges in the Intended Nationally Determined Contributions (INDCs). Non-state actors have now also been invited, to register their non-binding commitments in the NAZCA (Non State Actor Zone for Climate Action) registry. The absence of individual commitments and obligations on the adaptation side arguably constitutes the most significant difference between the two governance domains. Parties are not steered nor held accountable for commitments to undertake adaptation to a certain level. The Nairobi Work Programme (NWP), established in 2005 under the UNFCCC, invited partner organizations (non-state actors) to make voluntary action pledges, thereby preceding the similar approach with NAZCA on the mitigation side. However, the database only includes two entries, and no state actors made pledges.

Whereas few principles, norms and rules, have been set for *doing* adaptation and *how much*, more has been agreed for *planning* adaptation, in terms of **commitments to plan and procedures/guidance to follow (VI)**. The UNFCCC has stipulated the need for plans to be prepared and communicated to the UNFCCC and also provided guidance for planning exercises. This ‘facilitative’ approach to adaptation (Khan and Roberts 2013) was introduced already in the 1992 Convention text (Art 4.1b and e) and in the 1997 Kyoto Protocol (Art. 10b). It was subsequently followed up with the introduction of the National Adaptation Programmes of Action (NAPAs) in 2001 and the National Adaptation Plans (NAPs) in 2010. The former is a planning modality for Least Developed Countries (LDCs) to identify urgent adaptation priorities, with the planning process and subsequent priority projects eligible for funding from the LDC Fund. The latter is a planning tool targeting all developing countries, where LDCs can again access financial support. In connection with the INDC process, countries have also been invited to report on their ‘undertakings in adaptation planning’. Developing countries wanted adaptation to figure strongly in INDCs, but failed to get stronger language on this (Sovacool and Linnér 2016). Two institutions have been set up to in different ways provide technical guidance on planning and facilitate learning; the LDC Expert Group and the Adaptation Committee. Numerous resources have been mobilized for NAPAs and NAPs, both within the UNFCCC and under the auspices of non-state actors.³ These planning commitments and guidance set norms and principles for how to eventually do adaptation, and can hypothetically steer Parties by raising adaptation on their domestic political agendas and framing and normalizing it in certain ways.

The UNFCCC has also been highly active in developing **guidance and information exchange on adaptation good practice (VII)** – in other words, setting norms on what constitutes good adaptation and best practice. This is possibly one of the indicators of a global adaptation regime where we see highest productivity. Milestones include, the NWP which in 2005 was launched with the objective “*to facilitate and catalyze the development and dissemination of information and knowledge that would inform and support adaptation policies and practices*”. It has resulted in numerous documents and databases, and has invited ‘pledges’ for collaboration and contribution from a range of national governments, non-state actors and IGOs. The Adaptation Committee, established as part of the 2010 Cancun Adaptation Framework, has further developed this function. The Committee’s mandate is to: provide technical

³ See e.g. UNFCCC NAP Exchange <http://www4.unfccc.int/nap/sitepages/Home.aspx> , the UNEP-UNDP NAP Global Support Programme <http://www.undp-alm.org/projects/naps-ldcs> , the UNEP-founded Global Adaptation Network <http://www.ganadapt.org/> .

support and guidance to Parties; share relevant information, knowledge, experience and good practices; promote synergy and strengthening engagement with national, regional and international organizations, centres and networks; provide information and recommendations, drawing on adaptation good practices, for consideration by the COP when providing guidance on means to incentivize the implementation of adaptation actions, including finance, technology and capacity-building; and consider information communicated by Parties on their monitoring and review of adaptation actions, support provided and received. The Adaptation Exchange is a UNFCCC-sponsored attempt at sharing good practices and concrete examples of adaptation in practice. Finally, the UNFCCC website lists no less than 14 databases⁴ with knowledge resources for adaptation, for example on methods and tools, adaptation practices, private sector initiatives, ecosystem-based adaptation, gender-sensitive approaches. With all these initiatives combined, the UNFCCC has established a community of practice on adaptation and its related funds for adaptation support has enabled the development of an adaptation business community. More research would be needed on the impact of these soft, non-binding and informal norms on adaptation choices made at national and sub-national levels. However, again we observe a potential role in terms of global governance facilitating for agenda-setting in domestic political context, as well as framing and normalizing particular approaches to adaptation.

In addition to this facilitative approach, the UNFCCC has also imposed **reporting requirements (VIII)** on Parties regarding adaptation measures taken. Such requirements can be seen as inducing adaptation actions, to the extent that Parties want to be perceived as good and proactive performers and thereby design adaptation activities with the reporting formats in mind. There has been a requirement to report on adaptation actions and planning in the National Communications submitted under the Convention every four years, both for Annex I countries and non-Annex I countries. In 2014, it was in addition decided that Parties should report 'undertakings in adaptation' or report on adaptation in INDCs (Decision 1/CP.20). It is unclear at the moment which reporting format will be considered most important, also in view of the significant reporting made by developing countries as part of their NAPs. Still, there are proposal to elaborate and further specify what should be reported, in light of the debate on 'global adaptation tracking' (see above) (Magnan, Ribera, and Treyer 2015; Ford et al. 2015).

By far, the most debated, contested and visible aspect of adaptation governance under the UNFCCC is **commitment to provide financial support for adaptation (IX)** – should it be funded, how much, who should pay and how should the burden be shared? A principal agreement was made in the 1992 Convention that “developing country Parties that are particularly vulnerable to the adverse effects of climate change” shall be assisted “in meeting costs of adaptation to those adverse effects” by developed country Parties (Article 4.4). The story of subsequent agreements has been described elsewhere (Persson et al., 2009; Khan and Roberts, 2013). In brief, though, demands were increased by developing countries. There was some response in 2001 with the Marrakech Accords and the establishment of two Global Environment Facility (GEF) funds (Special Climate Change Fund and LDC Fund) and the Adaptation Fund under the KP. But the next big watershed moment – groundwork was made with the 2007 Bali Action Plan - was 2009 with the Copenhagen Accord, that committed developed countries to mobilise USD 100 billion per year, with a “balanced allocation” between adaptation and mitigation. It also established the Green Climate Fund (GCF), which will also fund adaptation activities. Developed countries have not agreed to translating this commitment into ‘nationally assessed contributions’, and

⁴ See http://unfccc.int/adaptation/knowledge_resources/databases/items/6996.php.

provision of funds remain on a voluntary basis. Further, how to account for climate adaptation finance and ensure it is ‘new and additional’ to development assistance has neither been resolved. A Standing Committee was installed under the UNFCCC, which have estimated the provision of financial support. Numerous initiatives for tracking adaptation finance and assessing adequacy and fairness have been taken by civil society and academia, as well as the OECD Development Assistance Committee. A best estimate of current public adaptation finance flow is that it was USD 23-26 billion in 2012-13 (UNEP 2014). However, overall, the rules on climate finance have been poorly defined (Sovacool and Linnér 2016) and can rather be viewed as norms at the moment, enforced through an informal system of peer pressure.

Tightly intertwined with governing who should pay for adaptation is the issue of the **means and channels through which it should be delivered (X)**, which has the potential of steering the design of adaptation activities on the ground in recipient countries. Developing countries were successful in arguing for new and additional funds under the UNFCCC (Article 4.4), although Article 11.5 of the Convention allows for developed countries to also use other channels, such as bilateral development assistance. The next question was whether these funds were to be managed by the GEF or independent bodies. Developing countries have voiced strong dissatisfaction with GEF and the methods with which it has assessed adaptation funding applications. Originally, it favoured a technological approach to adaptation, where only the additional costs of adaptation to climate change (as opposed to climate variability) could be funded (Klein and Möhner 2009). Approval increased with the decision to place the Adaptation Fund directly under the UNFCCC, rather than the GEF, as well as introducing the direct access modality. Still, in practice many funding proposals are developed by inter-governmental organizations as ‘implementing agencies’ and they have a lot of say in the design of activities and interpretation of ‘adaptation’ in a given context. Finally, a lot of donors have developed their own adaptation funds and prefer to use their bilateral portfolio, which mean developing countries have less control over funds. It remains to be seen whether COP21 will clarify how adaptation finance is to be channeled, but it looks unlikely with a wholesale shift to UNFCCC funds (GCF and Adaptation Fund).

Finally, perhaps the most direct and forceful way of governing how adaptation is practiced on the ground is through setting up rules for what kind of **activities eligible for receiving financial support (XI)**. Then, national and local norms, standards and rules can be effectively bypassed (although most guidance stipulates that activities need to comply with national legal and policy frameworks). For example, the body granting the funding can choose whether to promote a technology-based form of adaptation, ecosystem-based or vulnerability-focused adaptation. The two funds controlled directly by the UNFCCC have set up boards with equal representation by donors and recipients, whereas the GEF-controlled funds are dominated by donors. Reviews of the Adaptation Fund criteria have found that they have lacked important criteria and/or enforcement regarding, for example, the targeting towards particularly vulnerable communities within the applicant country and how to ensure benefits are sufficiently public and not captured by small groups of beneficiaries (Stadelmann et al. 2013; A. Persson and Remling 2014). Furthermore, their funded projects have tended to be impact-focused rather than vulnerability-focused (Remling and Persson 2015).

Is there a regime and what characterizes it?

Based on this review, we argue that the UNFCCC does indeed operate as a global adaptation regime, with a set of – to a large extent explicit – principles, norms, rules and decision-making procedures. Overall, actors today share expectations on how adaptation is and can be governed under the UNFCCC, although

proposals are constantly made either to expand or strengthen the regime (e.g. to introduce a global goal on adaptation and introduce obligatory financial contributions) or to contain or weaken it (e.g. to maintain the system of voluntary financial contributions and to allow for funding beyond the Convention funds). We argue there is a critical mass of principles, norms, rules and decision-making procedures in order to speak of an adaptation regime. Regarding the impact and effectiveness of the regime in terms of steering states' behavior and adaptation action on the ground, we provided a few examples above. However, further research is required to more systematically evaluate its effect on the ground and on national and local levels of adaptation governance.

While we argue that there is a critical mass of regime 'parts', it is clearly relying on *soft and voluntary norms* rather than hard and binding rules. The abundance of guidance on adaptation best practice (VII) and guidelines for planning (VI) are good examples. However, especially considering the regime part *par excellence* – individual commitments or obligations (V) – which many might consider *the* defining feature of strong international cooperation, the current adaptation regime exhibits a clear gap. This observation is in line with Khan and Roberts (2013) who argue that the UNFCCC adaptation regime has so far been largely 'facilitative', as opposed to prescriptive towards its Parties. It was described how this was to a large extent explained by the lack of operational definitions and metrics, but also likely due to the subsidiarity principle and political-economic interests of powerful negotiating groups to not seek further operationalization.

Applying the theoretical lens proposed by Bulkeley et al. (2014), it could be argued that the regime elements of offering guidance on best practice (VII) and establishing procedures for planning (VI) are examples of governance by discursive and normalizing practices. In line with Howlett (2000) argument, one interpretation of the findings above is that procedural instruments (such as guidance and planning, as well as setting up institutions such as the Adaptation Committee and the LDC Expert Group) have been preferred due to the unsettled legitimacy of the UNFCCC to govern adaptation at sub-global levels.

Paradoxically, while not prescriptive toward the national and sub-national level in terms of demanding individual commitments measured in a specific way, global adaptation governance is extremely prescriptive in terms of determining what local adaptation projects in developing countries get funding, through its funds the GCF and Adaptation Fund. This would have been less prescriptive if recipient country governments themselves could decide what to fund, i.e. if funding was based on general budget support rather than project-based.

Considering the provision of financial support rather than how it is used, it was seen above that highly prescriptive rules on how much to provide and through which channels have not been agreed. Instead, relevant UNFCCC decisions and text have been contained at a general and vague level, referring to principles (e.g., Article 4.4) rather than prescribing detailed arrangements, including on financial burden-sharing. Interpreting this state of affairs, Hall (forthcoming) suggests that the epistemic ambiguity (i.e., uncertainty over the nature of a task) has been effectively used to reinforce strategic ambiguity (i.e., heterogeneous political preferences) by the donor community. In other words, the lack of clarity on what adaptation is has provided donors more degrees of freedom to act unilaterally and decide their own channels for adaptation finance as opposed to developing stronger joint rules.

A (super-)wide regime complex? Towards a mapping of fragmentation

Based on the analysis above, we would argue that the adaptation regime under the UNFCCC is not *robust*, in that we do not see convergence across the four constituent elements that define a regime. In particular, we do not see principles and norms translated into or matched by rules (cf. Krasner 1983). Further, it neither appears to be a *comprehensive* regime, as defined by (Keohane and Victor 2011), since it does not appear to have been ‘demanded’ as a consequence of ‘sufficiently similar’ interests of essentially all the most powerful actors. Instead, the elements of adaptation governance that were included under the UNFCCC at the outset appear to have been so as a concession, or side payment, from developed countries to get developing countries on board for mitigation commitments and to participate in the mitigation regime. From a game theoretical perspective, Barrett (2001) states that when a cooperation game is characterized by strong asymmetry in preferences, side payments become a vehicle to increase participation and hence increase aggregate welfare.

Given the lack of convergence, Keohane and Victor's (2011) theory hold that major actors may prefer a regime complex to “any feasible comprehensive, highly integrated, institution”. We would argue that this is also what we can observe with global adaptation governance. The question is, though, if the presumptive complex is too wide, too fragmented and too all-encompassing to even qualify as a complex? Are we rather looking at a systematic pattern of IGO engagement (Hall 2015)? Following from that, what methodology could be used to study it empirically?

A further research question is whether it has become fragmented over time or it was ‘born’ this way? While climate mitigation is a broad issue area that addresses many economic sectors, adaptation is possibly even broader and multi-sectoral in nature. A proposition to be tested is whether a regime complex and fragmentation have not primarily resulted from heterogeneous preferences and interests in forum-shopping, but to a significant extent by the character of adaptation as a governance issue.

In figure 1 below, we identify the issue areas in global governance that to our knowledge have in various ways addressed the governance of climate change adaptation (see also Biermann and Boas 2010). For example, following the natural links identified between adaptation and *development* in the 1990s and early 2000s, the global community on development assistance quickly got engaged. Aid portfolios were governed so as to mainstream climate adaptation, and a number of new initiatives were launched. As an example, the World Bank launched the Pilot Programme on Climate Resilience in 2009 which with a budget of USD 1.2 billion far outweighs the UNFCCC funds. The OECD Development Assistance Committee, which coordinates bilateral donors, has taken upon itself to lead the development of statistical reporting on adaptation finance. Another example is the *disaster risk reduction* (DRR) area, to which many have pointed for overlaps, synergies and learning opportunities. The Sendai Framework on DRR for 2015-2030 states “[a]ddressing climate change as one of the drivers of disaster risk, while respecting the mandate of the United Nations Framework Convention on Climate Change, represents an opportunity to reduce disaster risk in a meaningful and coherent manner throughout the interrelated intergovernmental processes”. Finally, and hotly debated over the last year, the *migration* and *security* issue areas are increasingly addressing climate impacts as a key driver and, consequently, climate adaptation as a preventative strategy.

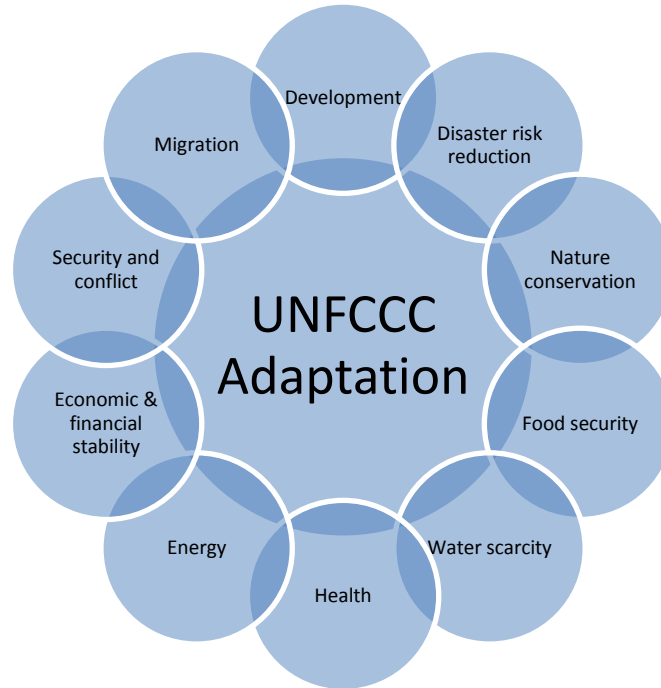


Figure 1. Issue areas in global governance that address climate adaptation

Clearly, it could potentially be considered a super-wide regime complex, with blurred boundaries. An empirical question is whether it is possible to within these issue areas determine what initiatives qualify as adaptation governance, using the (indistinctive) IPCC definition of adaptation and the definition of governance by, for example, Andonova, Betsill, and Bulkeley (2009). The purpose would be to identify overlaps, synergies or conflicts among principles, norms, rules and decision-making procedures, rather than just rhetorical issue linkages.

In future research, we intend to try this out with selected issue areas as case studies. We further intend to test the methodology and definitions developed by the CONNECT⁵ project, to enable subsequent comparison across regimes and issue areas. This methodology involves mapping out institutions⁶ in terms of their actor membership (state, business, civil society) and governance functions used (standards and commitments, operational activities, information and networking, finance). Importantly, this mapping approach and methodology has its limitations, especially concerning the second step. First, it only provides a snapshot view and fails to capture the longevity, dynamics and evolution of institutions and modes of governance. Second, it relies on self-reported governance activities of institutions, and not independently assessed implementation or effectiveness. Rather, these mappings show ‘claims’ to govern. Third, the categorization of governance functions in the mapping of the governance architecture does not reveal the power and authority with which they are enforced, beyond simple labelling as, e.g., ‘standards’ or ‘information exchange’. Finally, given the nature of the ‘universe’ of cases to be captured in databases,

⁵ See <http://fragmentation.eu/>. Their methodology is being applied to climate mitigation, forestry, oceans, fisheries, biodiversity.

⁶ Criteria for inclusion are: “institutions that are (i) international or transnational; (ii) display intentionality to steer the behavior of their members; (iii) explicitly mention a common governance goal; and (iv) have identifiable governance functions” (p. 7) (Dias Guerra et al. 2015).

the reliability in coverage of institutions and coding of governance functions is challenging to ensure. Despite these limitations, it would nevertheless be a worthwhile exercise to map the global governance regime around adaptation, as a basis for further studies into more longitudinal, evaluative, and critical studies.

Discussion

In this tentative discussion of results, we seek possible explanations to i) why predominantly soft and voluntary modes of governance have been introduced under the UNFCCC adaptation regime and ii) the high degree of fragmentation across the wider adaptation regime complex. We identify three possible, non-mutually exclusive, explanations.

First, as mentioned adaptation is characterized by high conceptual indistinctiveness, which means that the rationale for governance and public intervention is often tentative or contested. According to (Andonova, Betsill, and Bulkeley 2009), a defining feature of global governance is that “it is concerned with realizing public goals”. However, adaptation is not about realizing public goals in as clear-cut way as mitigation. Firstly, adaptation is often described as a process (including the IPCC definition) rather than a ‘goal’ in itself. Ideally, adaptation would not be necessary. Even though it can be anticipatory rather than reactive, it is in a way still reactive to expected future change or risk of change – hence the ambivalence towards and analytical challenges of defining decisive goals. Further, a consequence of its framing as a process is that it has often developed into technical discourse rather than political one. Guidance with process steps and charts tend to downplay notions of agency, responsibility and authority, as well as distributional implications. Secondly, the ‘publicness’ of adaptation can also be questioned. While mitigation will provide a global public good, i.e., lower atmospheric GHG concentration and a more stable climate system, many adaptation activities will yield (excludable) private benefits. Certainly there are many public benefits of adaptation, hence justifying it as a public goal, but it is likely this will need to be justified more on a case-by-case basis. At the very least, there is greater ambivalence around its validity and priority as a public goal. Arguably, this has contributed to the outcome of predominantly soft and voluntary modes of governance under the UNFCCC.

Second, the scalar framing of adaptation in both scientific and grey literature has typically been that it is a local or national issue that requires local or national responses and governance. Barrett (2008), for example, describe it as a local public good. Furthermore, adaptation has been projectised to a large extent (Dzebo and Stripple 2015), further predisposing it to a local/national scalar framing. This means that the case for global governance of adaptation has not so far rested on a shared understanding of it as a global public good, with the implication that international cooperation is necessary. As a consequence, there has been a misfit between problem scaling and action scaling at the global level. Arguably, this has also contributed to the soft and voluntary governance attempts at global level.

Increasingly, however, it is suggested that it should indeed be reconceptualised as a global public good. Based on the observation that many climate impacts will be transboundary (e.g. infectious climate-sensitive diseases, loss of biodiversity) or indirectly affect other countries (e.g., through migration, food price shocks), it is argued that adaptation must be re-scaled to the global level and that there needs to be institutional fit at this level (Moser and Hart 2015; Benzie 2014). Whether this institutional fit should be pursued by a stronger and more centralized UNFCCC adaptation regime (Khan 2013; Khan and Roberts

2013; Magnan, Ribera, and Treyer 2015), or in the wider, fragmented system alluded to above is an open question, though.

Finally, and from an interest-based perspective, these conceptual challenges and ambiguities have arguably enabled developed countries as donors to both i) limit the expanse of the UNFCCC adaptation regime and ii) nurture the fragmented nature of global adaptation governance architecture at large. Regarding scale, the projectification and emphasis on the local nature of adaptation might have made national adaptation commitments to seem less relevant. This might have been reinforced by the contested ‘publicness’ of adaptation as a goal and the fact that state responsibility is unclear. Under these circumstances, developed countries have been able to develop financing mechanisms and funds outside of the UNFCCC regime, as well as engage to some extent in forum-shopping.

Concluding remarks

To sum up, this paper asked what is being governed in current global adaptation governance. Proposing that an adaptation regime under the UNFCCC has indeed emerged, it was seen that originally it encompassed no rules and rather weak principles and norms. Over time, it gradually started to (claim to) govern how adaptation is framed, how it is planned for, and, not least, who should pay for it and what kind of adaptation activities international funds should support. The first two of these functions can be considered as discursive and normalizing modes of governance, whereas the latter more directly steer what kind of adaptation is undertaken on the ground. Further, the pre-COP21 proposals for a global goal on adaptation can be seen as explicit and decisive attempts to strengthen the regime. However, it looks unlikely that it will be conceptually and methodologically difficult to develop a credible goal or set of goals that can be meaningfully tracked at the national and global scales.

On the second question, why adaptation governance takes its current shape, it was suggested that it can be partly explained by conceptual and epistemic ambiguity around the notion of adaptation. Specifically, adaptation has so far not been defined, or constructed, as a global public good, meaning that it has been unclear for Parties what would be the rationale around which they mobilise efforts and commitments. That is, the rationale beside from addressing equity concerns and transferring adaptation finance from developed to developing countries, with the UNFCCC as one of the clearinghouses. It can also be partly explained by the preferences of developed countries to maintain options and forum-shop outside of the UNFCCC regime for transferring adaptation finance, including those they can exert greater control over.

Based on this analysis of the UNFCCC adaptation regime as a centerpiece, the next step in this research is to map the wider regime complex around adaptation and understand the level and key causes of fragmentation.

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