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Adaptation

The Neglected Dimension of Polycentric Climate Governance?

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17.1 Introduction

Adaptation and mitigation are two distinctive policy responses to anthropogenic climate change. In the past, the international climate change regime established by the United Nations Framework Convention on Climate Change (UNFCCC) emphasised the importance of reducing greenhouse gas emissions. International policy efforts, therefore, were orientated towards designing laws, policies and instruments to reduce emissions globally in an attempt to prevent anthropogenic climate change. Over the past two decades, the global climate regime has created a significant architecture to govern climate change mitigation globally by setting targets and identifying uniform instruments such as emissions trading systems to be implemented by member states. The effectiveness of this centralised climate governance architecture has been contested, however. The Paris Agreement presents a welcome paradigmatic shift in the international climate regime, as it no longer tries to achieve greenhouse gas emissions using a centralised mode of governance, but rather creates room for a more polycentric mode of governance (see Chapter 1).

Adaptation, on the other hand, was considered to be further down the political agenda – a distraction from the more urgent issue of avoiding the problem in the first place via taking mitigating actions (Biesbroek, Swart and van der Knaap, 2009; Lesnikowski *et al.*, 2017). Nonetheless, adaptation is a long-standing component of the international climate policy agenda. Until recently, however, it was largely framed as an issue relevant mainly to low-income countries. This dominant discourse changed in the mid-2000s, when it was politically acknowledged that some degree of climate change was unavoidable as emissions were not reduced quickly enough and that adaptation would be necessary to manage these impacts across all regions, in spite of efforts directed at mitigation. International debates on adaptation in the global arena have mostly centred around the politically sensitive

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issue of climate adaptation finance: should industrialised countries be held responsible for current climate change (i.e. failure to mitigate sufficiently) and therefore pay the most vulnerable developing countries and societal groups? If so, how much money is needed? And how should this money be distributed? Irrespective of these interminable debates, the global arena has paid very limited political attention to adaptation, and very few specific institutions and legal mandates on adaptation exist even today.

The lack of focused political attention to adaptation at the international level has resulted in a number of institutional voids. As a result of the increasing recognition of the need for adaptation action to manage the unavailable climate impacts, state and non-state actors across the globe have started to implement adaptation in an autonomous, bottom-up and self-organising fashion (Berrang-Ford *et al.*, 2011; Berrang-Ford *et al.*, 2014), thus appearing to confirm the first and most important proposition in polycentric theory ('local action'; see Chapter 1). In 2009, for example, 9 out of 28 European Union (EU) Member States had developed national adaptation strategies (Biesbroek *et al.*, 2010). By 2013, this number had increased to 21 (EEA, 2014). With regard to concrete policy actions, longitudinal studies observe a stark increase in the past decade: Lesnikowski *et al.* (2016) observe an increase of 84 per cent of reported adaptation work among 41 Annex I (high-income) countries between 2010 and 2014. Many of these concrete adaptation initiatives, however, are not initiated as a result of monocentric steering; in many cases, there are no shared rules that set goals or standards for how to adapt, nor are there specific guidelines or enforcement mechanisms. In fact, very few countries have dedicated legal frameworks for adaptation, although the number is increasing (Lesnikowski *et al.*, 2016). Instead, actors seem to be driven by, for example, experiences of local climate impacts, entrepreneurship, cooperative learning and policy diffusion – again exemplifying some of the core propositions of polycentric governance theory.

Consequently, the current adaptation landscape is still highly fragmented, characterised by unequal progress across contexts and unstable and ephemeral governance arrangements that suffer from high transaction costs. Some networks have self-organised to push for political commitments on adaptation, promote adaptation initiatives, share lessons learned and prevent negative trade-offs. New transnational institutional arrangements such as the EU Climate Change Adaptation strategy package, as well as non-governmental initiatives under the Covenant of Mayors and alliances such as the Africa Climate Change Resilience Alliance, are just a few examples of the soft and (in)formal networks designed to coordinate across scales and contexts. The Paris Agreement, where for the first time adaptation figures prominently alongside mitigation, aims to capitalise on this momentum and push for a stronger coordinated and globalised adaptation effort by setting a global

goal on adaptation. Indeed, while mitigation has started from a centralised mode of governance and adaptation from bottom-up modes of governance, both seem to be gradually converging in a more polycentric model of climate governance. This is evident in the Paris Agreement's emphasis on the social responsibility of multiple (non-)state actors across different scales to join forces, self-organise and implement mitigation and adaptation measures (Jordan *et al.*, 2015; see also Chapter 2).

The aim of this chapter is to critically reflect on the notion of polycentric governance and whether there are signs that a polycentric adaptation governance landscape is emerging. We first discuss in greater detail the governance of adaptation, highlighting key differences relative to governing mitigation. We then examine to what extent the existing literature on adaptation has characterised polycentric governance and its features. Finally, we use the characteristics of polycentric governance as set out at the start of this volume to assess whether there are signs of an emerging polycentric adaptation governance landscape (see Chapter 1).

17.2 Governing Climate Change Adaptation

The study of climate change adaptation largely emerged as distinct from climate change policy for mitigation in the mid-2000s. Early writing on adaptation focused on understanding key concepts like vulnerability and adaptive capacity, and assessing how the climate is expected to change, how costs and benefits of these impacts will be distributed and how vulnerability can be reduced (Smit *et al.*, 2000; Burton *et al.*, 2002; Smit and Wandel, 2006). There are two main discourses on vulnerability that have determined how adaptation is framed and governed: social vulnerability and climate impacts vulnerability (O'Brien *et al.*, 2007). The first discourse emphasises the global distribution of *social vulnerability*, highlighting societal groups and regions that will be unequally affected by climate impacts, particularly in low-income countries. The root cause of social vulnerability is not anthropogenic climate change, but rather a combination of complex social factors, including inequity and inequalities, poverty, poor education, high crime rates and limited access to healthcare. Climate change is expected to act as an amplifier of these pre-existing facets of social vulnerability. Adaptation is thus understood as the reduction of social vulnerability, which introduces a focus on intersections with development and development aid. A second discourse emphasises the *additional impacts* caused by anthropogenic climate change. Existing institutions, policies and practices were designed to deal with the natural variability of the climate system, but given the limitations of these systems to cope with projected climate change, additional policy efforts are needed to manage the increased climate risks (O'Brien *et al.*, 2007). Adaptation in this discourse revolves mostly around

explicitly formulated and highly intentional actions that target these additional climate change impacts (Dupuis and Biesbroek, 2013).

These different discourses characterise the different sociopolitical interests in adaptation and have greatly influenced the (inter)national negotiations on climate change adaptation. Indeed, the most recent definition used by the Intergovernmental Panel on Climate Change combines both discourses by stating that adaptation is '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: 118). Adaptation can be focused on maintaining the essence of the impacted system (*incremental* adaptation, or resilience), or changing fundamental attributes of the system to respond to the impacts of climate change or its effects (*transformational* adaptation). Furthermore, it can be the result of deliberate policy decisions and planning as to how to deal with climate change and its effects (*planned* adaptation), or the consequence of continuous independent changes of the system in response to various socio-ecological stimuli (*autonomous* adaptation). The literature on the governance of adaptation predominantly focuses on planned adaptation, which in itself has multiple dimensions.

Therefore, while mitigation and adaptation are both approaches to combating climate change, in its essence adaptation is fundamentally different from mitigation (Biesbroek *et al.*, 2009). As Table 17.1 summarises, for mitigation, there is a clear global goal (i.e. limit warming to 2 or 1.5°C), with specific measurement units (i.e. parts per million of carbon dioxide concentrations in the atmosphere, or tonnes of carbon dioxide equivalent emissions) that can be measured more or less objectively. This is not the case for adaptation. Although a global goal on adaptation is included in the Paris Agreement (i.e. enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change), the goal is very broad and does not function as a collective target to achieve. After all, the impacts of climate change are predicted to vary greatly across regions and vulnerable groups, and the capacity to adapt is distributed unequally across the globe. Moreover, adaptation is a process – there is no clear end point or final state of 'being adapted', but rather a continuous process of adjustment and change. For adaptation, the aim is thus to mainstream appropriate responses into vulnerable sectors, regions and societal groups. For example, adaptation in the public health sector aims to adjust procedures and systems to better respond to a range of risks affected by changing global temperatures, including the spread of vector-borne diseases and increased frequency and intensity of heatwaves (Austin *et al.*, 2016). Developing a quantifiable goal and universal measurement units that can be objectively applied is therefore highly problematic given the complexity of contexts in which adaptation is becoming relevant (Ford *et al.*, 2015). Although some have argued for using reduced vulnerability or climate

Table 17.1 *Differences between mitigation and adaptation*

	Mitigation	Adaptation
Definition	Reducing the cause of anthropogenic climate change	Adjusting to the unavoidable impacts of anthropogenic *and* natural climate change
Scale of problem	Solution to global problem, but requires implementation across all scales	Solutions to mostly local and regional problems but which can have global implications (e.g. food insecurity, climate migration)
Policy goal	Limit to well below 2°C global average temperature increase since pre-industrial levels, preferably limiting to 1.5°C	Enhance adaptive capacity, strengthening resilience and reducing vulnerability to climate change
Key indicators of success	Quantifiable: e.g. reduced greenhouse gas emissions	Difficult to quantify: e.g. impacts averted, reduced vulnerability, resources dedicated to specific policies or projects
Role of politics	Highly politicised in most instances	Depoliticised and technocratic in most instances
Policy timescale	Medium to long term	Short to medium term (and increasingly long term)

Sources: Biesbroek *et al*. (2009); Locatelli *et al.* (2015).

impacts averted as indicators for successful adaptation, these indicators – and how they are designed – are highly contested in the literature, making it extremely difficult to assess progress on adaptation globally, evaluate which governance interventions work (and which do not), and determine whether current investments in adaptation finance are sufficient. Finally, adaptation is often not very appealing for private-sector finance, as building seawalls, changing building codes and enhancing water retention projects are targeting public goods that tend to fall under the responsibility of state and local governments. Private-sector finance for public goods, as is the case in, for example, clean energy projects and technological development in mitigation, rarely happens in the context of climate change adaptation.

17.3 How to Govern Adaptation: Adaptive, Multilevel and Network Governance Theory

An examination of the adaptation governance literature indicates that polycentric governance is rarely used as an explicit concept or theory in the context of climate change adaptation. Instead, most studies on the governance of adaptation build on

three different but related strands of theory in which most adaptation research has been conducted: adaptive governance, multilevel governance and network governance.

17.3.1 Adaptive Governance

Within adaptation scholarship, polycentric governance is largely approached as a mechanism or a pathway for *adaptive governance*. Some of the adaptation scholarship that borrows from adaptive governance theory assumes that the inherent uncertainties and dynamic complexities associated with adapting to climate change impacts require governance systems to be highly flexible, with embedded redundancies that increase resilience to system shocks (Djalante *et al.*, 2013; Herrfahrdt-Pähle, 2013). Monocentric, state-based systems, on the other hand, are considered ill suited to dealing with rapid environmental change and delivering contextually sensitive solutions (Chaffin, Gosnell and Cosens, 2014), and system transformations are needed to enable more adaptive forms of governance to emerge. Pahl-Wostl *et al.* (2012) specify polycentricity as a structural feature of adaptive governance systems that distributes decision-making powers across the system and ensures coordination through an overarching system of norms and rules that defines the logic of interactions between actors. This literature also stresses the importance of the potential to encourage experimentation and bespoke solutions across scale, place and time (Becker, Huitema and Aerts, 2015), and to promote knowledge-pooling and learning opportunities (Djalante *et al.*, 2013). Plummer *et al.*'s (2012) synthesis of the adaptive co-management literature concludes that issues of scale interplay and scale fit, adaptiveness, flexibility and learning, evaluation and knowledge are crucial components of governing complex socio-ecological systems.

From a normative standpoint, successful polycentric systems for adaptation therefore require feedback pathways through which new information about human–environment interactions, values and goals and uncertainty can be integrated into decision-making processes. Without ongoing scientific monitoring, governance systems are therefore unable to adjust in light of uncertainty and non-linear change (Chaffin *et al.*, 2014). For example, Nelson, Howden and Smith (2008) argue that the risk of failure in policy experimentation is managed through redundancies built into the institutional structure of polycentric systems, whereas in systems with irreducible scales, governing by trial and error leaves systems vulnerable to failure. Other authors try to provide concrete tools and methods to support decision-makers in designing flexible policies that deal with the uncertainties and system dynamics, for example the work on dynamic adaptation pathways (Haasnoot *et al.*, 2013). These authors argue that technocratic and linear models of

decision-making no longer suffice as they oversimplify complex realities and cannot deal with the large uncertainties associated with climate change. Through continuous learning, experimentation and acquiring new knowledge of how the climate system changes, initial adaptation actions might need to change, thus requiring flexibility in the pathways to prevent lock-in and maladaptive decision-making.

Although a strong normative claim is made in favour of polycentric governance principles, very few studies empirically demonstrate the value of such approaches for climate change adaptation (e.g. Karpouzoglou, Dewulf and Clark, 2016). In one exception, however, Pahl-Wostl *et al.*'s (2012) comparative study of governance arrangements in water resource management indicates that regimes with multiple centres of decision-making and strong coordination mechanisms demonstrate better water management outcomes; as such, they argue that polycentric regimes may be an important pathway towards building adaptive capacity.

17.3.2 Multilevel Governance

The second strand in the literature focuses on the *multilevel governance* characteristics of the system, and the mismatch between the level(s) at which policy problems manifest and the level(s) at which they are managed. This literature responds to a strong emphasis on 'localism' that dominates much of the adaptation literature. In line with the polycentric governance literature, several scholars emphasise and advocate for decision-making empowerment at lower jurisdictional levels, particularly among local governments, while ascribing responsibility for oversight and knowledge diffusion to higher levels of government (Becker *et al.*, 2015). Much of this literature has focused on the emergence of possible tensions and mismatches that follow from connecting across levels and scales. For example, the limited powers of local governments and discursive conflicts among networks of state and non-state actors over how to frame climate policy can challenge the ability of cities to take a leading role in climate change planning (Bulkeley and Betsill, 2005; see also Chapter 5). Keskitalo *et al.* (2016), for example, observe that in Nordic countries, limited leadership from national governments has partially contributed to a pattern of soft and voluntary adaptation policy approaches at the local level, and limited observable success in advancing adaptation implementation. The authors argue that this points to the need to integrate adaptation requirements into more traditional regulatory regimes and instruments that can be more directly enforced by the state. Similarly, Westerhoff, Keskitalo and Juhola (2011), examining adaptation in Finland, Italy and Sweden, find that where adaptation is not mandated from the central government, local climate change action tends to emerge without the financial and staff resources necessary for the long-term

success of adaptation. This trend has significant distributional effects between local governments within a country, where those larger cities with stronger tax bases and networks of experts can better substitute this lack of support using local resources. Small and medium-sized municipalities, however, might suffer from a competitive disadvantage vis-à-vis these 'early adapters' who consume much of the issue attention and scarce resources.

Empirical studies on local adaptation identify a number of structural, procedural and contextual challenges for local government engagement with adaptation, including: (1) a lack of adequate climate information and future scenarios to guide local decision-making; (2) limited or no guidance from national- and state-level governments on adaptation priorities; (3) mismatches between existing statutory and revenue-generating powers and the major decisions required for effective adaptation at the local level; (4) scarce resources and competing policy priorities that local governments have to balance; (5) departmental fragmentation and competition for scarce resources; and (6) different problem framings that lead local governments to approach adaptation in divergent ways, sometimes leading to maladaptive practices (e.g. Mukheibir *et al.*, 2013). Even in countries where adaptation emerged as a priority at the national level first, fragmentation of governance efforts across vulnerable regions is still observable. For example, Finland, an early adopter of national adaptation policy, has emphasised the mainstreaming of adaptation into national administrative sectors, while lower levels of government are pursuing separate and voluntary climate strategies, with limited input from senior government (Keskitalo, 2010). This adaptation scholarship thus recognises the fragmented adaptation landscape and, building on multilevel governance insights, stresses the need for a governance system that actively steers adaptation decision-making across levels, distributes tasks, responsibilities and resources equally and ensures cooperation and some level of conflict resolution between competing actions, referring frequently to forms of meta-governance.

17.3.3 Network Governance

The third strand of the adaptation literature that addresses polycentric characteristics is, as noted in Chapter 1, *network governance*. Much of this literature emphasises the relationship between public and private actors and seeks to address how different network configurations increase trust among different stakeholders. The literature investigates, for example, different types of governance arrangements that bring together different public and private stakeholders with vastly varying tasks and responsibilities (Tompkins and Eakin, 2012). These studies show that governments play an important role in creating and maintaining these networks in efforts to connect public and private actors. Mees (2017), for example,

shows in her study of 20 governance arrangements in North American and European cities that local authorities are initiating most of these processes and are in the driver's seat throughout, leaving limited room for private-sector and civil society initiatives for self-governing. Many network governance studies demonstrate potential for collaboration but also highlight potential weaknesses, including the need for trust, conflicting norms and values, blurring of responsibilities, the inability to actually influence decision-making and the 'shadow of hierarchy' that might still exist. Schmidt *et al.*'s (2013) study on collaborative governance finds issues such as repeated participation of network members, appropriate information and network management and inclusive and responsive network practices amongst the most important factors for successful network governance of climate change adaptation.

Some of this literature specifically stresses the importance of network structure and relationships between stakeholders to organise connectivity within those governance arrangements (Termeer *et al.*, 2011). In the context of water governance, for example, Horning, Bauer and Cohen (2016) show the importance of the core-periphery network structure, and the consequence of asymmetry in power in terms of limited diversity of input and decision-making authority. They argue that the disconnect between core and periphery within these networks needs to be addressed through bridging and bonding efforts, i.e. by bringing in 'bridging actors' that have a high degree of contextual understanding, legitimacy and trust of the other network members. Such bridging to increase connectivity can take different forms, some of which are quite monocentric in nature.

17.4 Emergence of a Polycentric Adaptation Landscape?

The three strands of the climate change adaptation literature demonstrate that many of the studies on adaptation include key characteristics of a polycentric governance system. We bring these together here to critically reflect whether a polycentric adaptation landscape is indeed emerging using the propositions discussed in Chapter 1: local action, mutual adjustment, experimentation, trust and overarching rules.

17.4.1 Local Action

Polycentric governance emphasises the inadequacies of one-size-fits-all approaches to managing environmental issues, and instead points to small-scale, local solutions as the most effective entry point for collective action. The city of Rotterdam in the Netherlands, for example, self-organised its comprehensive adaptation programme to ensure timely adaptation (Biesbroek *et al.*, 2014).

There is widespread evidence in adaptation scholarship that many cities and local regions across the globe have already taken measures to adapt to climate change. Reckien *et al.*'s (2014) study of 200 large and medium-sized European cities sampled from 11 countries found that 28 per cent of cities had formal climate adaptation plans. Meanwhile, participation in climate policy networks seems to correlate with increased likelihood of local adaptation policies (Ryan, 2015). In a survey of 350 local governments participating in the ICLEI network, Aylett (2015), for example, finds that nearly three-quarters of respondent cities are engaging with adaptation planning in addition to mitigation.

However, much of the local-level adaptation literature is biased towards cities that have engaged with adaptation, but does not ask why many cities are *not adapting* (see also Chapter 5). Looking at more than 400 global cities of more than one million inhabitants, Araos *et al.* (2016) found that 81 per cent of the cities do not demonstrate any signs of developing and implementing climate change adaptation initiatives. Similarly, small and medium-sized towns and cities are reported to face considerable constraints when it comes to policy capacity to start adapting, particularly in low-income countries (Wisner *et al.*, 2015). While some local governments act as key sites for adaptation planning, ongoing pressures around decentralisation and privatisation across countries frequently result in the downloading of adaptation responsibilities to regional or local governments without additional and sufficient resources or decision-making powers. Romero-Lankao (2012) argues that rather than encouraging local control of adaptation planning, this practice is in fact undermining local resilience and institutional capacity. Some scholars have argued that in the adaptation discourse, local action has become such a powerful heuristic that it is actually harming the intellectual debates and concrete policy advice on how to adapt to climate change by over-simplifying complex intersections between jurisdiction, authority and impact scales, particularly with regards to addressing underlying drivers of social vulnerability. Nalau, Preston and Maloney (2015), for example, convincingly argue that emphasis on local action is ignoring multiscale climate risks and interdependencies between different parts of the globe, and that many policy actions might need to be implemented at higher levels of government to ensure efficiency (e.g. building and maintaining national flood defence systems).

In conclusion, whilst adaptation is indeed emerging from myriad bottom-up initiatives, and many of the actions are local, there are many parts across the globe where intentional climate change adaptation is not taking place. Moreover, the 'adaptation is local' heuristic is highly problematic as it suggests that there are no trade-offs between different contexts and that higher (inter)national-level coordination is not necessary for climate action.

17.4.2 Mutual Adjustment

Polycentric theory assumes that independent governing units mutually adjust to allow for collaborations to address a particular issue. Examples from network governance literature demonstrate the emphasis on creating self-organising structures in climate change adaptation. For example, Fünfgeld (2015) discusses how transnational municipal networks have the potential to support local adaptation as they provide greater flexibility than government adaptation policy and encourage experimentation. Other networks and partnerships have emerged to share practices, exchange ideas and distribute knowledge and often take fluid forms; they exist for a short(er) period of time before being dismantled. Of particular interest in the context of mutual adjustment is the concept of *synchronisation* that some adaptation scholars have used. Synchronisation is linked to the argument of co-evolution, where different systems exert multiple influences on each other, therefore shaping the evolution of the governance system – for example parasitic, interferential and symbiotic co-evolution. It assumes that most organisations and sectors do not have the capacity to organise stable and durable connectivity between governing units and therefore require some collaboration to govern adaptation (van Buuren and Gerrits, 2011). Coherent chains of interactions of the various interconnected governing units are needed to manage decision-making. Hence, interaction and reflection among actors is necessary to make sense of one another's actions and to allow for gradual (or abrupt) alignment. Organising synchronisation is to some extent dependent on the ability of actors to connect individuals and governance processes that all have their own development logic and self-organising dynamics. The emphasis is therefore on creating an enabling governance arena that allows for interactions. Verkerk, Teisman and van Buuren (2015), for example, show how the Dutch national government's 'Delta programme' co-produced governance arrangements that allowed for synchronisation to occur between the different levels and actors involved in decision-making about long-term water safety in the Netherlands. Mutual adjustments are thus a potentially key part of the debates on adaptation, and empirical evidence suggests that mutual adjustments are increasingly advocated, providing room for governing units to connect and collaborate and create trusting relations.

17.4.3 Experimentation

The existing literature suggests that experimentation contributes to the governance of adaptation in various ways as it offers novel options in both processes and outputs of adaptation. Across the globe, mainly local experimentations have been conducted to better understand how adaptation works, and whether lessons learned

can be upscaled to higher levels of governance and other contexts. In their comparative urban adaptation study, Castán Broto and Bulkeley (2013), for example, assessed adaptation experimentation and innovation in 100 cities and found that local governments still play a leadership role in initiating climate adaptation experiments but that the political space becomes increasingly blurry as public and private authorities are partnering to seek specific forms of interventions in cities. Various experiments can be found, ranging from technological and architectural projects to innovative forms of public service delivery and policy implementation. The Dutch 'Building with Nature' project is an example where technological and governance experimentations are implemented by both public and private actors to better understand how natural system dynamics can be used to build flood protection. Various experiments in hydrological labs as well as in pilot study sites have helped to gain a much more thorough understanding of what possibilities this type of ecosystem-based adaptation offers (van Slobbe *et al.*, 2013). Another Dutch example is from the city of Rotterdam, where the city council heavily invested in creating a favourable political and institutional environment that allowed it to experiment with different types of adaptation measures, for example in experimenting with water plazas as temporary storage facilities for rainwater in public spaces during periods of heavy precipitation. The council considered the reward of investing in experimenting with various forms of adaptation worthwhile as it offered them a pioneering role as one of the global urban adaptation leaders (Biesbroek *et al.*, 2014). Creating political and institutional space, taking some calculated risks and learning from failure are crucial ingredients of experimentation. When the time is ripe, such experiments may diffuse or upscale to national levels or other places (see Chapter 9), as has happened in both Dutch examples. Many other such examples of local experimentation are reported in the literature, but most of these initiatives are still biased towards leading (Western democratic) cities and local contexts.

17.4.4 Trust

Trust is considered a crucial condition for adaptation, but remains an understudied topic in most studies. Studies on social capital in low-income countries have particularly stressed the importance of trust and demonstrate how new and existing relationships facilitate cooperation and collective action through trust-building (Adger, 2003). However, other studies find that too much trust and interdependency amongst community members might hamper self-organisation and mobilisation, as Paul *et al.* (2016) found in Ethiopia. Increasing social capital (and trust) could be unhelpful to strengthen ambitions, but rather results in *laissez-faire* attitudes among actors. Increasing the number and diversifying the type of actors – core

assumptions underlying polycentric governance theory – are not necessarily generating trust to engage collectively on climate change adaptation. Consequently, introducing new actors, public or private, might rapidly erode trust, which takes time to gradually (re)build. Moreover, vicious cycles of distrust have been shown to significantly impact how local farmers in South Asia, for example, have constrained their adaptive actions as they can no longer rely on each other for community-based adaptation owing to past conflicts. Given the scarce adaptation literature on trust, it is impossible to conclude on the role of trust in polycentric climate change adaptation governance.

17.4.5 Overarching Rules

Adaptation scholarship has recognised that overarching rules are necessary. Amundsen, Berglund and Westskog (2010), for example, demonstrate that local governments prefer to have some guidance (and resources) at national and regional levels to ensure that adaptation takes place in a coherent and consistent manner, but without a formal requirement to adapt. Most adaptation is thus guided by procedural rules – for example, the requirement to have a local adaptation strategy or specific considerations of adaptation in impact assessments – rather than substantive rules of specific goals and targets to be achieved. Most of the adaptation scholarship has called for specific rules and principles to overcome barriers to adaptation that are created and/or should be removed by local governments. Very few instances of rules for conflict resolution – as suggested by Ostrom (see Chapter 1) – have been propagated. This links closely to the debate about whether climate change adaptation requires establishing a new policy field with its own logics, rules and resources. Massey and Huitema (2013), for example, show how in England, efforts are being made to develop adaptation as a specific policy field with its own substantive authority, institutional order and substantive expertise. This would mean that overarching rules are developed. However, several scholars have called for integrating climate change adaptation into existing policy subsystems, and suggest that existing rules, norms and practices in each subsystem should be considered as a starting point for adaptation (Uittenbroek, Janssen-Jansen and Runhaar, 2012), including conflict resolution. Studies show that the number of laws, policies and guidance has increased rapidly over the past years, but are particularly in place for high-income countries. In the absence of these rules, adaptation progresses in a highly uneven manner across places, jurisdictions and vulnerable groups (Lesnikowski *et al.*, 2016), even at local levels (Araos *et al.*, 2016).

17.5 Conclusions

In this chapter, we have argued that mitigation and adaptation have followed different pathways; mitigation historically was mostly centrally governed, whereas adaptation has emerged bottom-up through processes of self-organising in the absence of strong overarching rules, principles and goals. We have demonstrated that whilst adaptation scholarship does not necessarily use polycentric governance theory, but rather adaptive governance, network governance and multilevel governance, the key characteristics of polycentric governance are nonetheless visible in the many cases from across the globe we discussed. Does this mean that adaptation mirrors the polycentric governance model that Ostrom proposed?

In several places across the globe – mostly high-income countries – early signs of the emergence of a polycentric adaptation landscape become visible. In many instances, adaptation is local, self-organising and increasingly connected, and efforts are made to create overarching sets of rules to govern adaptation. States are making efforts to seek the optimal mix between monocentric steering and polycentricity in order to reconcile some of the limitations of both modes of governance. There is ample evidence suggesting that this is proving a very successful model as early-adopting cities, regions and countries across the globe have made considerable progress.

However, these insights are biased towards high-income countries and leading cities and regions that have started to adapt. In future studies, we should be more conscious about places where adaptation is currently not taking place – or is at least not visible in current scholarship (Araos *et al.*, 2017) – and start to raise questions around whether the polycentric model is feasible in these contexts. For example, what about developing countries that are dominated by monocentric governing systems and where we currently see very few examples of experimentation, overarching rules or mutual adjustments specifically for adaptation (in contrast to, for example, disaster risk reduction or development aid)? How do these propositions of polycentricity align (or clash) with the strong state and bureaucratic structures in these contexts? Investigating the optimal mix between what is or what should be the mix between monocentric and polycentric elements in various contexts across the globe will be an important next step to govern climate change adaptation.

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