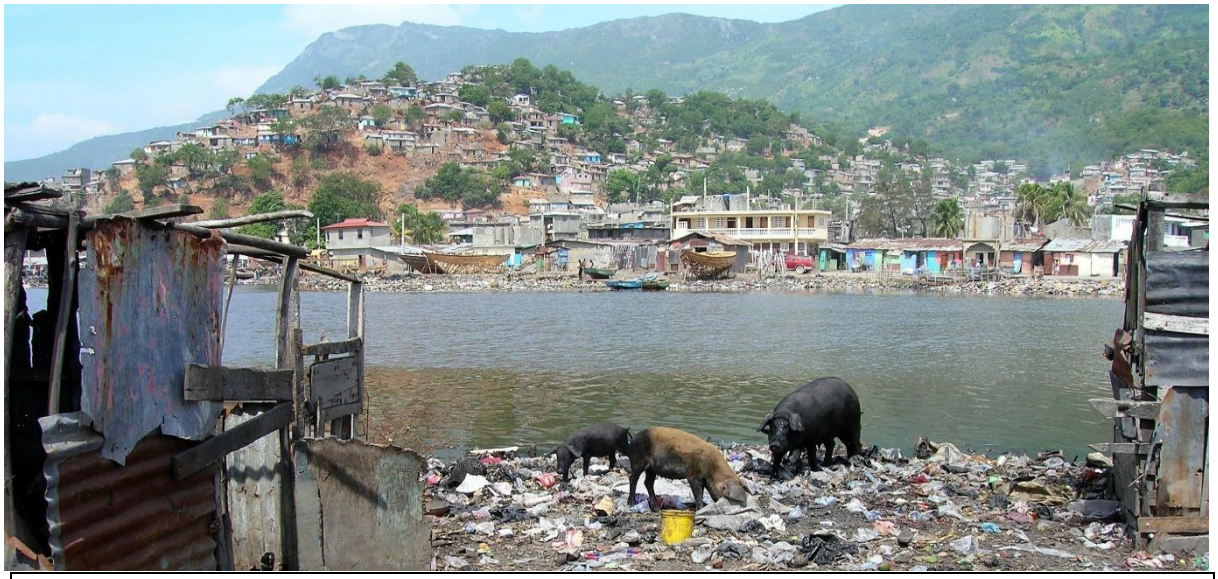

Title

Issues and Challenges of Adaptive Governance

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Contents

1. Summary

The Peri-cene project has the challenge of working with a multiplicity of causes, effects and responses. Peri-urban development, climate risk and vulnerability, and adaptive governance and pathways, are complex, contingent and often controversial. In this work package, we focus on crucial qualities of governance for the Peri-cene agenda and the formation of adaptive pathways for peri-urban / climate-environment interactions. This deliverable is the first of two parts to address 'governance & institutional issues & challenges' and focuses on a specific quality of adaptive governance, namely collaboration. The second part examines governance approaches to flooding in peri-urban areas. Both of these reports will inform the Peri-cene 'pathways' workshop in 2021.

2. Overview of the Academic Literature on Collaboration in Adaptive Governance

Collaboration is a central characteristic of adaptive governance to address climate change adaptation. Adaptation is a relatively new policy realm for cities and regions. Activities are often focused on the planning phase rather than implementation and assessment. Thus, published empirical research on the topic is still emerging. This deliverable provides a global review of research on collaboration between state and non-state actors for climate adaptation in cities and their regions. To be clear, the focus is on the practices of collaboration rather than assessing the efficacy of the actual adaptation measures. This approach is helpful to identify key trends in the empirical findings as well as research gaps.

These examples from the literature include a range of city types (informal settlements, districts, capital cities, peri-urban areas, regions), environmental concerns (mostly water-related, but also heat waves and agriculture), different methods of collaboration (workshops to policy-planning and implementation), and researcher positionality (conducting the collaboration to observing). For the most part, the empirical examples focus on the initial phase of developing policy. In the following sections, we present the research design and then summarise the key themes that emerged.

2. Methodology

For this empirical review, we first conducted a keyword search that included combinations of the following and their variants: adaptation; adaptive; city; climate change; co-design; co-production; collaboration; collaborative; community-based adaptation; deliberative; governance; local; participation; participatory; resilience; and urban. We selected articles based on their relevance, with a primary concern that they include an empirical case study of collaboration between state and non-state actors. We also used the snowball method to identify additional publications from the reference lists of the selected literature. The review includes publications from 2005 to 2019 in English

language, peer-reviewed journals, in multiple environmental sector and in all areas of the world. We then coded the empirical sections of the selected publications using the following themes: challenges to collaboration; trade-offs; temporal scale; previous experience of extreme weather events; synergies; advantages; and socio-economic inequalities. These themes were inspired by both the existing literature and inductively through commonalities across the publications. **Table 1** lists each individual city, with 31 case studies from 20 publications (note that some publications contain multiple case studies).

The majority of the case studies focused on city or municipal scale actions; eight focused on regions; four on slums; and three on neighbourhoods and wards. About half of the cases involved a coastal area. Several were chosen for their 'best-practice' international status (Anguelovski et al. 2014), commitment to climate change action (Wamsler 2016), or because the city is viewed as 'information-rich' in climate adaptation (Brink and Wamsler 2018). Discussions of the geography of these collaborative measures for adaptive governance were largely missing, and were largely limited to the environmental impacts of climate change. We also gathered information on researcher positionality and collaboration practices to develop insights on the practicalities of conducting research on adaptive governance. The findings are presented in the following sections.

Table 1. Selected Cases of Collaboration in Adaptive Governance

Country	Adaptation Focus	Author(s)
Australia (Adelaide)	Heat waves	Akompab et al., 2013
Bangladesh (Dhaka)	Flooding	Haque et al., 2012
Canada (Halifax, Toronto)	Heat waves, flooding	Henstra, 2012
Canada (Quebec City)	Heat waves, water management	Cloutier et al., 2015
Chile (Santiago)	Heat waves, flooding	Barton et al., 2015
Colombia (Cartagena)	Heat waves, flooding	Stein and Moser, 2014
Ecuador (Quito)	Water management	Anguelovski et al., 2014
Germany (Bavaria)	Flooding	Wamsler, 2016
India (Bhubaneswar, Gujarat, Indore, Surat)	Water management	Chu, 2016
India (Gorakhpur, Indore)	Flooding	Bahadur and Tanner, 2014
India (Surat)	Flooding	Anguelovski et al., 2014
Mexico (Upper Lerma River Valley)	Flooding	Eakin et al., 2010
Mozambique (Maputo)	Drought, flooding	Castán Broto et al., 2015
Netherlands (Arnhem, Rotterdam)	Heat waves	Mees et al., 2015
Portugal (Coastal municipalities)	Flooding	Schmidt et al., 2013
Senegal (Saint Louis)	Flooding	Vedeld et al., 2015
South Africa (Durban)	Heat waves	Anguelovski et al., 2014
Sweden (Helsingborg, Lomma, Malmö)	Flooding	Brink and Wamsler, 2018
Tanzania (Dar es Salaam)	Flooding	Vedeld et al., 2015
United Kingdom (Christchurch Bay, Orkney Islands)	Flooding	Few et al., 2007
United States (Fresno, San Luis Obispo)	Water management	Moser and Ekstrom, 2011
Vietnam (Can Tho, Ho Chi Minh City)	Flooding	Birkmann et al., 2010

3. Findings

a. Challenges to collaboration

Documenting the difficulties of collaboration was the most prominent theme that emerged from the review. This ranged from practical capacity (such as time and funding), institutional capacity (formal structures to support collaboration), quality of participation, and perceptions of climate change. The theme of challenges links to several other themes, especially trade-offs, temporal scale, and socio-economic inequalities.

Facilitating long-term collaboration (rather than a one-time workshop) requires funding and time commitment from those involved. Collaboration in the global South often had funding from international networks, for example German government funding in Santiago (Barton et al., 2015), Rockefeller Foundation funding for the Asian Cities Climate Change Resilience Network (Anguelovski et al., 2014; Bahadur and Tanner, 2014; Chu, 2016), and Quito's involvement in several international networks (Anguelovski et al., 2014). A common challenge identified by all authors was is to sustain projects after initial funding has been exhausted (Wamsler, 2016; Vedeld et al., 2015) and the overall high cost of conducting collaboration activities (Brink and Wamsler, 2018; Haque et al., 2012).

Beyond challenges of funding and time, government agencies require institutional capacity and structures in place to facilitate such engagement. A long-standing issue involves traditional and 'siloed' planning approaches and a lack of coordination across departments and scales that limits the abilities of local governments to adequately address the complex characteristics of adaptation (Akompab et al., 2013; Anguelovski et al., 2014; Barton et al., 2015; Brink and Wamsler, 2018; Schmidt et al., 2013; Wamsler, 2016; Vedeld et al., 2015). Institutional capacity is further needed to implement collaborative plans. From their research in Ho Chi Minh City (Vietnam), Birkmann et al. (2010, pg. 197) highlight this challenge: "many strategies proposed, such as better land use planning and improved building codes, although important, often do not sufficiently match the reality, which is characterized rather by a lack of provision of public infrastructure and constraints of formal planning processes" (see also Castán Broto et al., 2015). In effect, the authors found that traditional government structures are not fit for purpose for climate adaptation measures.

Two additional strains on institutional capacity were raised in the literature: the status of informal settlements and corruption. Collaboration is an important activity in informal settlements and slums that often face multiple stress factors. However, the regulatory status of these areas can undermine collaborative actions. For example, in Barrio Policarpa (Colombia), "local authorities had clarified publicly that they were not permitted to invest public resources in the *barrio* because of its location in a high-risk area subject to recurrent flooding" (Stein and Moser, 2014: pg. 177). Corruption, often in the form of clientelism and weak enforcement of existing land use regulations, was also raised in cases in the global South and in informal settlements (Bahadur and Tanner, 2014; Eakin et al., 2010; Vedeld et al., 2015). Clientelism can create incentives against finding proper legal and institutional solutions, as found in the case of Indore's water management (Bahadur and Tanner, 2014).

Another challenge to collaboration is the quality of participation. If the collaboration happens too late in decision-making process or is not taken seriously, stakeholders often perceive the goals to be predetermined, or the process itself as merely tokenism (Akompab et al., 2013; Few et al., 2007). Collaboration often attempts to involve a range of actors from different sectors and demographics.

This diversity can pose a challenge, for example in Gorakhpur (India), Bahadur and Tanner (2014, pg. 206) note that "the Brahmin caste (the highest caste) had also been difficult, as many of them were uneasy about being physically seated at the same level as the rest of the community in project meetings, and participating as 'equals' within decision-making processes." Thus, cultural and political issues play an important role in the effectiveness of collaboration.

Empirical research on collaboration for climate adaptation stresses the challenge of confronting multiple perceptions, which relates to 'post-truth' and climate denialism, the technical and expert-led framing of climate science, urbanization, and responsibility. For effective collaboration on climate adaptation, the parties involved need to accept climate science. Anguelovski et al. (2014) and Moser and Ekstrom (2011) document climate denialism among the public and government in Durban (ZA) and Fresno (US) respectively. In Dar es Salaam (Vedeld et al., 2015) and Toronto (Henstra, 2012) a low public awareness of climate adaptation was found. Wamsler's (2016, p. 190) interviews in Bavaria revealed that some residents believed that officials fabricated flood warnings, and this hindered collaboration and implementation of adaptation measures: "Residents ignored emergency warnings and evacuation instructions… This failure led to time-consuming, costly and dangerous rescues by boat and helicopter. Furthermore, residents often do not pay sufficient attention to official instructions during the recovery phase."

If adaptation is viewed by stakeholders as a technical issue, it can be perceived as outside of the scope of lay knowledge and the sole responsibility of experts and the government (Birkmann et al., 2010; Few et al., 2007; Schmidt et al., 2013; Wamsler, 2016). Wamsler (2016) found that residents perceived municipalities as the responsible party for adaptation while municipal officials perceived that higher government levels were responsible. Relatedly, policymakers may view the public incapable of making important contributions in this field (Few et al. 2007; Schmidt et al., 2013), and residents may feel they lack an in-depth understanding of planning processes (Brink and Wamsler, 2018). On the other hand, Castán Broto et al. (2015) warn that collaboration could result in the transfer of climate change governance responsibilities to communities. Finally, the perception of whether changes in the climate are from an 'urban' source can link to which actors or regions are deemed responsible. A case study of an urbanizing region in Mexico by Eakin et al. (2010) shows how stakeholders perceive water as a 'rural' issue and not one for municipalities to govern, thus linking urbanization with climate change and responsibility. In Portugal, officials view urban expansion and coastal defense as the reason for coastal retreat (Schmidt et al., 2013).

b. Trade-offs

Trade-offs were also commonly documented in empirical studies of adaptive governance for climate adaptation. This relates to attempts to develop synergies and integrate adaptation into urban development plan, while engaging with a diversity of groups. Examples include trade-offs between mitigation and adaptation measures and trade-offs among varying social, economic and environmental concerns. These can also be viewed as mismatches, negative consequences and/or externalities occurring across sectors and scales. For example, Wamsler (2016) explains that there can be individual adaptation measures that obstruct or hamper other individual or institutional measures. Likewise, institutional measures can obstruct or hamper other institutional or individual

measures. Birkmann et al. (2010, pg. 197) stress that future research and practice should take trade-offs into consideration: "negative consequences or externalities of structural measures, such as dyke systems or relocation, should be discussed and made transparent. Some of the adaptation measures proposed for HCMC [Ho Chi Minh City] will have severe secondary implications not only for the city and its inhabitants, but also for the surrounding urban, peri-urban and rural areas" (see also Vedeld et al., 2015). This highlights the relational character of adaptation responses.

In the search for sustainable synergies, Anguelovski et al. (2014) found an economic versus environment frame in Durban, Brink and Wamsler (2018) revealed that economic concerns faced adaptation measures that could reduce property values in Sweden, and Castán Broto et al., 2015 identified trade-offs between funding luxury residences and providing basic services to informal settlements in Maputo. Schmidt et al. (2013: 323) highlight an example of prioritizing the economy in Portugal: "to keep this iconic vision of the coast, some local officials prefer to play down risks, arguing that coastal erosion problems are not that serious. This approach is designed to prevent the urban and commercial devaluation of coastal areas." An example from Gorakhpur (India) shows how trade-offs can intersect with inequalities, as one social group benefitting from an adaptation measure while another group is disadvantaged. Bahadur and Tanner (2014: 205) noted that "some wealthier households had built boundary walls around their homes to prevent floodwaters from entering. This led to greater risks to those more vulnerable adjacent households who could not afford boundary walls." This highlights the uneven consequences of implementing adaptation measures.

Other trade-offs are related to cultural differences. For example, Mees et al. (2015) found that heat wave adaptation measures can be perceived as paternalistic and an encroachment on personal freedom, and Wamsler (2016) found that individuals were reluctant to participate in an urban greening initiative because they felt that it threatened their privacy (see also Cloutier et al., 2015). These trade-offs highlight the challenge of developing adaptation measures that (1) consider the diverse priorities of different social and economic groups, and (2) integrate adaptation measures into urban planning and climate governance.

c. Temporal scale

One way that trade-offs are framed in adaptation discussions is connected to time and the long-term character of climate science. This is also connected to the challenge of the perception of climate science. Adaptation requires action in the present to prepare for possible future events. The temporal scale creates a challenge of 'making the case' for adaptation given scientific uncertainty and long-term time frames (Barton et al., 2015), which can clash with short-term political cycles (Schmidt et al., 2013). Several studies highlight the difficulty in convincing communities of necessary action for future weather events in both the global North and South (Bahadur and Tanner, 2014; Barton et al., 2015; Chu, 2016; Cloutier et al., 2015; Few et al., 2007), especially with other pressing concerns in the present. In Bhubaneswar this has impacted the governance approach: "the overall urban agenda has framed climate adaptation in terms of immediate capacities for responding to and managing the impacts of extreme events, rather than dedicating significant investments towards addressing slow-onset effects" (Chu, 2016: 444). Conversely, in Adelaide, which faced repeated extreme heat waves, the situation was seen as an emergency in the present and this influenced decision-making: "all the

stakeholders mentioned that due to this urgency, the different actors involved in the process realised the need to ensure that decisions were quickly reached in order to move the process forward" (Akompab et al., 2013: 1010).

d. Experience of extreme weather events

A caveat to the above theme of the temporal scale, often discussed as a challenge to adaptive governance for climate adaptation, is the local experience of extreme weather events. This has been documented across the global North and South as a catalyst for community and government action. Brink and Wamsler's (2018: 90) study of three municipalities in Sweden have all been affected by 'high-profile' weather events, where "citizens seemed to learn quickest from exposure to hazards", for example "as Klagshamn regularly suffers storms and pluvial flooding, property owners' awareness of their responsibilities and the need for individual and community-based adaptation measures has increased." In addition to the above-mentioned heat waves in Adelaide, (Akompab et al., 2013), floods propelled local action in Maputo (Castán Broto et al., 2015), Quito and Surat (Anguelovski et al., 2014), Dar es Salaam (Vedeld et al., 2015) and preceded Eakin et al.'s (2010) research in the Upper Lerma Valley (Mexico). A blizzard following a hurricane inspired action in Halifax, and in the case of flooding in Toronto: "dramatic media images of the storm – such as a gaping trench carved through a major road by a swollen creek – generated a period of heightened public and political awareness of the potential impacts of extreme weather events" (Henstra, 2012: 182).

Experiencing extreme weather events also inspired national flood planning in Bangladesh (Haque et al., 2012) and Senegal (Vedeld et al., 2015). These experiences at multiple scales can be utilized for producing local climate knowledge. For example, a Participatory Climate Change Asset Adaptation Appraisal in Cartagena "identified the most important weather events affecting the *barrio* based on the experiences and historical memories of their citizens" (Stein and Moser, 2014: 173).

e. Synergies

Trade-offs are the most prominent features in empirical studies of adaptive governance but synergies (benefits of mitigation-adaptation and integrated approaches) are also present. Wamsler (2016) notes that some individual measures can complement other individual or institutional measures and vice versa. Anguelovski et al. (2014: 159) found this in practice in terms of mitigation and adaptation: "The development and implementation of Quito's Climate Change Action Plan reflects the holistic vision of decision-makers to maximize mitigation strategies that also contribute to adaptation and build resilience. Adopted actions have to create win–win results. For instance, some strategies combine benefits derived from reforestation, water conservation, and biodiversity." Similarly, a collaborative approach in Halifax sought to mainstream climate adaptation into the city's overall climate and urban development plans (Henstra, 2012). This illustrates how collaboration is used to create win-win solutions in a limited number of cases.

f. Advantages

The theme of advantages takes shape around examples that document benefits either for individual participants and communities or the government. Individuals can benefit by improving their knowledge (Barton et al., 2015; Brink and Wamsler, 2018; Cloutier et al., 2015; Moser and Ekstrom, 2011) and gaining the confidence and empowerment to engage with the policy process (Castán Broto, et al. 2015). Bahadur and Tanner (2014) found that residents demanded more accountability from their local representatives and challenged local corruption in Gorakphur, and in Indore a Citizens Advisory Council was started, which had input in planning and provided a sense of community and a space to engage.

In terms of the government perspective, there can be increased institutional capacity building (Stein and Moser, 2014), access to and improvements of data (especially qualitative) and developments of knowledge-sharing platforms (Haque et al., 2012; Moser and Ekstrom, 2011), building legitimacy and consensus for implementing adaptation plans (Barton et al., 2015; Haque et al., 2012), and raised awareness and education for risks and disaster response (Brink and Wamsler, 2018; Chu, 2016; Vedeld et al., 2015). Another advantage is the opportunity for transfer and scalability. In their case study, Vedeld et al., 2015: 306 note that "the success of the Saint Louis local governance model has made it a country-wide approach to city and sub-city level governance in Senegal".

g. Socio-economic inequalities

Inequalities are discussed in empirical case studies in terms of access to participation to the collaborative process as well as addressing existing inequalities such as uneven vulnerabilities to climate hazards. Few et al. (2007: 56) stress that this consideration is important for collaboration: "the participatory approaches that are likely to successfully engage key stakeholders need to be assessed: different social contexts may require different approaches, especially in order to attract and sustain dialogue with 'hard to reach' stakeholders" (see also Brink and Wamsler, 2018). In other words, collaboration needs to be customised to particular stakeholder situations.

Related to the perception of who should participate in climate adaptation, Stein and Moser (2014) challenge the idea that the poor are simply victims, but rather are valuable assets to collaboration. They (p. 180) write, "it clearly shows that the urban poor know about weather and have reasonable knowledge of how extreme and severe weather events affect their assets and well-being at the household, community and business levels." Cases of the urban poor show how environmental stressors and socio-economic stressors can combine and interlink with urbanization. Part of the reason such groups live in these climate-affected and high-risk areas is the attraction of low value land, processes of rural-urban migration, and lack of affordable housing. Such settlements are characterized by weak services and infrastructure where long-term solutions are not accessible or affordable.

4. Researcher Positionality and Collaboration Practices

In addition to analysing the main themes of the chosen publications on adaptive governance, we documented researcher positionality in collaboration practices. Some of the above research involved active participation from the researcher while others simply observed the collaboration process. Of the above, the following were active facilitators: Barton et al. (2015) organized participation; Castán Broto et al. (2015) conducted action research through 'Participatory Action Plan Development'; Cloutier et al. (2015) facilitated workshops; Haque et al. (2012) conducted a multi-criteria analysis (MCA); Mees et al. (2015) co-organized workshops with local authorities; Moser and Ekstrom (2011) facilitated workshops; and Stein and Moser (2014) facilitated Asset Planning for Climate Change Adaptation. This latter case was the only instance where the researchers offered to train locals. In one case, the researchers began as observers and then became active facilitators (Few et al., 2007). These examples include both global North and South cases. Several of these cases used previously developed facilitation tools (Castán Broto et al. 2015; Haque et al. 2012; Stein and Moser 2014).

The majority of the researchers adopted a traditional outsider approach to research. Some conducted interviews with individuals that were involved in previous collaborations and conducted participant observation (PO) of on-going collaboration activities (see **Table 2**). Some involved climate change-affected residents and vulnerable populations, a few attempted to involve the wider public (this indicates that these collaborations are more about identified stakeholders rather than the public). Many involved 'experts', climate scenarios and climate science. Two specifically mentioned 'consensus' building/decision-making. Some used ranking and prioritizing methods. Almost all used qualitative methods; except for mixed methods that included MCA by Haque et al. (2012).

Table 2. Researcher Positionality and Collaborative Practices

Author(s)	Researcher Positionality	Collaborative practices
Akompab et al., 2013	Outsiders: interviews	A lead agency was selected to facilitate collaboration and define goals. A steering group and small working groups were also established. They used consensus decision-making and an assurance mechanism for feedback to ensure transparency.
Anguelovski et al., 2014	Outsiders: interviews and PO	Initiated a climate change forum and partnership
Anguelovski et al., 2014	Outsiders: interviews and PO	Officials sought traditional and indigenous knowledge input. A program for youth to develop climate action plan was developed. ACCCRN set up a City Advisory Committee. They used visioning and scenario planning at workshops.
Bahadur and Tanner, 2014	Outsiders: interviews and PO	ACCCRN set up a city advisory group made of experts that oversees activities. They used climate scenarios, climate change awareness raising, and held problem solving meetings.

Barton et al., 2015	Insiders: organized participation	Ten thematic roundtables with three science working groups (land, water, energy): meetings had presentations and participation activities. Developed a Regional Climate Change Adaptation Plan and an Implementation Manual
Birkmann et al., 2010	Outsiders: case study, field research	Formal planning and Informal planning (autonomous adaptation without formal plans)
Brink and Wamsler, 2018	Outsiders: case study, interviews, non-participant observation	Of 17 city-community interactions in three municipalities, 12 were initiated by the city, half used hard forms of governance, and four had a 'clear continuous dialogue' for collaboration
Castán Broto et al., 2015	Insiders: action research 'Participatory Action Plan Development'	Consensus building through five steps that used community assessment, problem definition meetings, electing a committee, an 'open community' meeting, and a final workshop
Chu, 2016	Outsider: comparative case study, field research	Civil defense corps (volunteers) for disaster management ACCCRN: community-based water management, scenario planning workshops, and a multi-stakeholder platform for adaptation planning
Cloutier et al., 2015	Insiders: facilitators	Ran workshops over three years with 100 total participants: 12 sectoral workshops; set of workshops on risk assessments; intersectoral forum; design workshops
Eakin et al., 2010	Outsiders: case study and field research	Interviews with officials and flood-affected residents about their collaboration experiences and perceptions
Few et al., 2007	Outsiders: interviews and observations Insiders: facilitators	Facilitated discussions, ranking and exercises, and group policy 'mapping' tools; focused on time scaled and adaptation options (protect, accommodate, retreat)
Haque et al., 2012	Insiders: MCA facilitators	CLIMACT software for Multi-criteria analysis with a range of options, stakeholder criteria selection, expert assessment, a focus group, prioritizing options, and a sensitivity analysis
Henstra, 2012	Outsiders: case study	NGO collaborated with the Toronto Environment Office; an expert panel presented on climate science; officials then engaged with the community via forums, workshops, and a call for comments. Two working groups developed proposals and hosted workshops and information sessions. A consortium of climate adaptation experts proposed a policy to the Halifax Regional Council to develop a pilot partnership. A steering committee and informal working group were established and had meetings and consultation sessions.
Mees et al., 2015	Insiders: workshop co-organizers with local authorities	Two interactive, multi-stakeholder workshops: divided into groups on health care and the built environment, discussed the division of responsibilities. One focus group included the vulnerable population (elderly).
Moser and Ekstrom, 2011	Insiders: facilitators	A natural systems report and workshop was followed by a social systems report and workshop. Local officials were leaders of the process and facilitated small group

		sessions; then held a decision-maker forum and a public workshop. Post-workshop evaluation survey and informal follow-up conversations
Schmidt et al., 2013	Outsiders: interviews	Interviews with officials and citizens about the perceptions of collaboration and adaptation measures
Stein and Moser, 2014	Insiders: facilitators of Asset Planning for Climate Change Adaptation process	Developed background assessments, trained local facilitators, conducted 22 focus groups, a planning workshop. Solutions were prioritized with predetermined criteria and the top two priorities of each group were merged into a plan
Vedeld et al., 2015	Outsiders: case study and field research	Conducted focus groups and validation workshops
Wamsler, 2016	Outsiders: case study and field research	Interviews and follow-up surveys with stakeholders about their collaboration experiences

5. Conclusions

This review provided insights on emerging empirical research on collaboration as an adaptive governance tool for climate change adaptation in urban areas. Give that adaptation planning is a relative new policy realm for cities, the focus of most collaboration activities was on the initial planning and implementation phase, and often focused on water-related adaptation concerns such as flooding.

Overall, the reviewed articles provided evidence on case studies from the Global North and South in a range of urban geographies and types (informal settlements, districts, capital cities, peri-urban areas, regions), environmental concerns (mostly water-related, but also heat waves and agriculture), different methods of collaboration (workshops, policy-planning, and implementation), and researcher positionality (observation, facilitation, action research). We identified seven key themes in the literature: challenges to collaboration; trade-offs; temporal scale; experience of extreme weather events; synergies; advantages; and socio-economic inequalities. Challenges to collaboration was the most prominent theme that emerged from the review, examples ranged from practical capacity (such as time and funding), institutional capacity (formal structures to support collaboration), quality of participation, and perceptions of climate change.

The findings from this research provide insights on how state and non-state actors are collaborating to address climate change adaptation in cities and regions. While none of the case studies serves as a 'silver bullet' or best practice for implementing collaboration in adaptive governance, they demonstrate how emergent modes of governance are being developed to address a range of challenging issues while enhancing democratic participation and accountability.

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