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Climate justice and global cities: mapping the emerging discourses

1. Introduction

Ever since climate change came to be a matter of political concern, questions of justice have been at the forefront of debates. Within the international negotiations, significant effort has been expended on negotiating such matters, for example the relative responsibilities of different nation-states for reducing greenhouse gas emissions, how and by whom adaptation finance should be raised, and the extent to which different private and civil society actors should have a seat at the negotiating table. Within different national contexts, questions of justice and climate change have also been raised. For example, recent debates in Australia over the introduction of a ‘carbon tax’ draw on broader debates about who might lose and who might gain from such measures (Büchs et al., 2011) while in Germany and Japan questions of the future of nuclear power bring to the fore questions of intergenerational justice (Butler et al., 2011). Different policy responses to climate change have also drawn attention to notions of justice. To give just one example, debates over the Clean Development Mechanism have sought to illuminate the extent to which local communities can both participate in the process of project design and gain from the financial flows that are created as a result of particular interventions (Boyd and Goodman, 2011). While the politics of the forms of justice to which responding to climate change is giving rise may appear hidden within the formalities of the policy processes, procedures and techniques for accounting for carbon, the measurement of adaptation capacity and so on, commentators in the academic community and beyond have been quick to draw attention to the potentially uneven and inequitable nature that such responses may have, showing that “communities vulnerable in the face of climate change can also be vulnerable when confronted with adaptation and mitigation intervention and discourses” (Marino and Ribot, 2012, p.391).

Given the relative prominence of questions of justice within the climate change domain, it is perhaps all the more curious that there has been little interrogation of how these play out in the urban context as municipalities and other urban actors seek to respond to climate change. Over the past two decades, cities have increased their efforts to address climate change. Initial efforts made in the 1990s by transnational municipal networks and individual local authorities focused on reducing greenhouse gas emissions. More recently, this has been complemented by local initiatives and widespread recognition that cities must prepare for climate impacts. Indeed, in 2010 the World Bank described the imperative of addressing the

twin challenges of climate change mitigation and adaptation at the urban scale as an ‘urgent agenda’ (World Bank, 2010). While the global environmental governance community is beginning to build a picture of how and why cities are pursuing climate mitigation and adaptation, the social and environmental justice challenges that such actions raise often remain hidden from view. In this paper, we seek to examine whether and how principles of justice are emerging within urban responses to climate change. Taking as a point of departure discussions within international politics about what constitutes a just response to climate change, together with the difference between ‘distributional’ and ‘procedural’ formulations of justice advanced in wider debates on environmental justice (Dobson 1998, Low and Gleeson 1998, Schlosberg 2007), we examine the ways in which concerns about justice are being articulated in the planning and implementation of urban climate change policy and projects, and consider the extent to which the city provides an arena within which questions of climate justice need to be thought anew.

In the first section, we consider how notions of justice have been articulated in relation to climate change mitigation and adaptation. We distinguish between ‘distributive’ and ‘procedural’ notions of justice and explore the extent to which existing formulations of climate justice are applicable to the urban scale (Schlosberg 2007). We find that there are some interesting differences across the mitigation and adaptation domains in the ways in which principles of climate justice have been articulated, and some critical challenges in translating these principles into the urban arena. In the second part of the paper, we use these concepts to analyse the discursive representation of climate justice in urban climate governance. Drawing on an analysis of projects and interventions taking place in one hundred global cities in response to climate change, we find explicit articulations of distributive and procedural justice across the adaptation and mitigation domains in only a small number of cities. We focus our analysis on this ‘purposive’ sample, exploring the ways in which discursive representations of climate justice differ between cities in the global north and global south, and across the mitigation and adaptation arenas (Castán Broto and Bulkeley 2013).

Alongside the examination of these particular initiatives, we supplement our analysis by considering discursive representations of justice in the climate mitigation and adaptation plans of three cities in which some of these projects were located – Quito, Toronto and Philadelphia. We find that there is a common focus on issues of distributive justice across

these different arenas, and that in relation to adaptation, matters of distributive justice are more often framed in terms of benefits to individuals, while in the mitigation arena, collective rights are more often articulated. The focus on collective rights is also more often articulated in initiatives in the cities in our sample that are part of the global south, where discourses of procedural justice are also more prevalent. Our analysis of the planning processes in Quito, Toronto and Philadelphia demonstrates that climate governance is being articulated as a process through which to provide benefit to marginalised communities and to include them in processes of decision-making, suggesting that where principles of justice are being articulated at the urban level this is taking place both within formal planning processes and in discrete project-based initiatives. In conclusion, we suggest that the principles of climate justice that have been developed in the international sphere provide a productive starting point for analysing how these issues are being framed and addressed in the urban arena. However, we argue that in order to take account of the different forms of climate justice being articulated at the urban level, we need to move beyond such accounts and consider the ways in which processes of urbanisation serve to shape responsibilities, rights and the ability to participate in making climate change decisions. .

2. Climate change, justice and the city

Issues of justice, equity and legitimacy have been central to both policy and academic debates about the politics of climate change (Bulkeley and Newell, 2010; Giddens, 2009; Grubb, 1995; Marino and Ribot, 2012). For the most part, the conceptualisation of justice as it pertains to climate change has drawn from principles of political philosophy which seek to establish what might provide a fair basis for the division of responsibilities for responding to a common resource problem and where obligations, to current and future generations, might lie (Caney 2010; Grubb 1995). Such principles do of course have something to say about how decisions should be reached, but the focus is on the outcomes and consequences of (in)action. In a parallel debate, concerns have been raised about the accountability and transparency of climate policy, and discussion has taken place about the ways in which decision-making over the use and protection of global commons can be made more legitimate or democratic (Gupta 2010). In both debates, there has for the most part been an assumption that the appropriate scale at which these issues need to be resolved is the international - as a global problem, climate justice is assumed to be a matter of determining the appropriate division of burdens and benefits either between nation-states or individuals as members of a global community, and likewise matters of enhancing legitimacy in decision-making also turn on how states and individuals are involved in global politics.

More recent scholarship on climate justice has also sought to draw on the wider literature concerning environmental justice. First coined by the US social movement that sought redress from the exposure of poor and minority ethnic communities to environmental harm, the concept of environmental justice has since given rise to other forms of social movement, a policy vocabulary, and a research field (Agyeman et al. 2003; Walker and Bulkeley 2006). Within environmental justice scholarship (for example Schlosberg 2007; Shrader Frechette, 2002), conceptualisations of climate justice – that is, the mobilization of justice with respect to climate policy – have been characterised by a distinction between *distributive* and *procedural* justice (O’Brien and Leichenko, 2010). This engagement has therefore provided a means through which to bring concerns for the outcomes and processes of climate policy into the same frame of analysis. Yet despite the origins of the environmental justice movement in local struggles over risk, for the most part the debate on climate justice remains framed at the international level. In this section, we explore these debates in more detail. We examine the concepts of distributive and procedural justice in turn, examining the ways in which principles of justice have been applied to climate mitigation and adaptation, and considering the implications for questions of climate justice at the urban scale.

2.1 Distributive justice: rights and responsibilities

Rights and responsibilities in the context of climate justice can be conceptualized as two sides of the same coin. Debate about ‘rights’ has centred on who has the right to emit greenhouse gases while debate about ‘responsibilities’ has emphasized who should take responsibility for climate change impacts and their amelioration, generally in terms of reducing greenhouse gas emissions. Either way, the emphasis has been on *mitigation*: the responsibilities of nation-states for reducing emissions of greenhouse gases (Bulkeley, 2001). The mitigation focus of debates can at least in part be explained because of the way in which mitigation “presents a well-delineated dilemma to the global community: that of how to allocate rights to emit greenhouse gases to the global atmospheric sinks between countries” (Paavola and Adger, 2006, p.595). Initially, the debate was cast in north-south terms, with the argument made that the north should take action (first) because of its responsibility for the vast majority of emissions to date, its continuing high levels of per capita emissions and its capacity to take action (Grubb, 1995; Shue, 1999). A strong undertone to most of these debates has been a concern for inter-generational equity (Grubb, 1995). For instance, the United Nations Framework Convention on Climate Change (UNFCCC) frames the need for action on climate

change action in terms of the need to “prevent dangerous anthropogenic interference with the climate system” (United Nations, 1992, Article 2), and a common thread between the approaches in both the global north and south has been circumventing the possibility of future harm and ensuring inter-generational inequity.

While overarching principles of justice with respect to climate change mitigation—that those with most responsibility should act first—have been accepted within the international community, determining who is (most) responsible has proved problematic. For instance, Füssel (2010) identifies a number of controversies which have emerged as nations attempt to quantify responsibility for climate change:

“the main controversies in the quantification of national responsibility for climate change are the inclusion of emissions from land-use change, of non-CO₂ gases, of early emissions, of “subsistence” emissions (in contrast to “luxury” emissions), and the consideration of non-linear effects, of delays between emissions and impacts, and of natural conditions that influence energy demand (e.g., current climate) and energy supply options (e.g., hydropower potential)” (Füssel, 2010, p.600).

In addition, the question of how to deal with those countries – notably rapidly industrialising nations in the global south – whose current contributions to greenhouse gas emissions may be growing, has been highly contested. One attempt to resolve this question is that of Roberts and Parks (2007), who acknowledge the existence of varying development pathways in their attempt to quantify national responsibility, and suggest ‘profiling’ nations in terms of their different roles in the global economy as a potential mechanism for assigning responsibility. While a focus on responsibility for emissions reductions is representative of much of the literature, debates have also been concerned with which countries have the right to benefit from mitigation policy in terms of flows of finance, technology transfer and so on. The common theme in the international mitigation policy arena is that principles of justice are framed with reference to nation-states, where nation-states are seen as both the arbiters of justice and the scale at which the costs and benefits associated with climate change mitigate should be distributed.

If formulating a just approach to climate change mitigation is challenging, climate change adaptation poses even more complex justice dilemmas (Marino and Ribot, 2012; Adger et al, 2006). All of the debates about rights and responsibilities become more visceral in the context of adaptation, primarily because adaptation raises direct, *intra*-generational questions about the rights of vulnerable communities and the responsibilities of those who caused the climate change towards them. For instance, the UNFCCC (1992, Articles 4.4, 4.8) stated that developed countries should assist developing countries with the task of adaptation, a principle which was reaffirmed in the Kyoto Protocol (Grubb, 1999). But the impacts of climate change remain uncertain, and even where it is clear that some places are at greater risk than others (notably small island states and delta regions) debate has raged over how such risks ought to be compensated (Grubb, 1999; Tol et al., 2004).

Furthermore, it is recognised that climate change adaptation poses different moral questions than mitigation. For example, Paavola and Adger (2006) note that one ethically relevant difference between strategies of adaptation and mitigation is that the former poses questions of just distribution not only between burden-takers (i.e. those who take responsibility for adaptive or mitigating action) but also between recipients of benefits (e.g. financial compensation, assistance with adaptation measures). While mitigation in several respects can be seen as realising a common good – or perhaps better put, a strategy producing a good for much of the global community – alongside individual benefits, adaptation most clearly benefits (and indeed, may harm) those deemed to be in need of the goods the adaptation strategy is targeting (Jagers and Duus-Otterström, 2008) and the wider benefits are perhaps less apparent. Thus, while it is possible to identify two central duties with respect to climate change – the duty of mitigation (the duty to cut back on activities which cause climate change) and the duty of adaptation (the duty to devote resources to protect people from the ill effects of climate change) (Caney, 2010) – allocating responsibility for fulfilling these duties, negotiating rights to and from climate change responses, and the burdens and benefits that these incur, remain highly contested within the international arena.

Within the academic community, there has been a concern to move beyond the policy focus on the allocation of rights and responsibilities of states to consider how international responses to mitigation and adaptation might be grounded in justice principles rooted in the respect and value given to individual persons. To this end, Simon Caney (2005) explicates a

theory of climate justice, distinguishing it from ‘orthodox’ theories of distributive justice on the grounds that:

“an adequate theory of justice in relation to climate change must explain in what ways global climate change affects persons’ entitlements and it must do so in a way that (i) is sensitive to the particularities of the environment; (ii) explores the issues that arise from applying principles at the global rather than the domestic level; and (iii) explores the intergenerational dimensions of global climate change” (Caney, 2005, p.750).

Caney’s approach overcomes some of the difficulties arising from the different ways in which the mitigation and adaptation aspects of climate policy have framed rights/responsibilities in relation to particular kinds of environmental goods and bads (greenhouse gas emissions, water availability etc.) through the use of the concept of *entitlements*, but in this formulation, climate justice remains resolutely distributive. Furthermore, while in this formulation the object of justice is not the nation-state but the individual, it is grounded in a Rawlsian approach in which individuals are regarded as occupying neutral positions as the starting point from which to consider how international principles of climate justice might be enacted (Rawls, 1999 [1971]). Consequently, this framing obscures differences within and between individuals below the level of the nation-state, and as such in the rights and responsibilities towards climate change that are to be found within urban communities. This is critical, since as Harris (2010) identifies, the current focus on responsibility of nations “fails to account for rising greenhouse gas emissions among affluent people in less responsible states of the developing world”, with the effect that “solutions to climate change will have to include hundreds of millions of affluent people in the global south, alongside most people in the north, if they are to capture the impacts of as many of the sources of global warming as will be required to mitigate future impacts significantly” (p.219). Applying Harris’ (2010) admonition that we must frame responsibility for adaptation less in terms of states and more in terms of people also means that vast risk differentials existing within developing countries must also be taken into account to achieve just adaptation policies.

In summary, both mitigation and adaptation raise critical issues of distributive justice which are visible in debates about how responsibilities or duties should be conceived and the rights

to the benefits and burdens that may accrue from both responses and a lack of action to address climate change. More or less implicitly, such principles have been invoked in relation to the politics of international negotiation, where questions of allocation and distribution are framed in relation to the nation-state. This framing has been questioned both from the basis of political philosophy, which has sought to place the individual and their entitlements within such debates, and by those who have argued that the complex spatial distributions of emissions and impacts mean that the nation-state can no longer adequately contain all that might be meant by climate justice.

2.2 Just procedures: inclusion and participation

While debates over the justice implications of climate change have tended to focus on matters of distribution, this has not been to the exclusion of all considerations of what is often termed ‘procedural’ justice – that is, of who should take decisions over what, by what means and on whose behalf. To date, like those debates on distributional justice, attention has focused on the formal processes of international decision-making over climate change and discussions about how such processes can be made more transparent and legitimate (Gupta, 2010). Numerous concerns have also been raised about the extent to which such processes are subject to the sway of particular interest groups, including both those who advocate more stringent responses to climate change and those that seek to campaign against any such action, and here too debate has raged to and fro as to what the basis of such processes might be in terms of to whom such groups may be held to account (Betsill and Corell, 2008). In the adaptation arena, researchers have similarly pointed to the critical implications of the design of policy responses and who has access to them, and the implications of uneven patterns of participation in decision-making procedures (Paavola and Adger, 2006). Across both mitigation and adaptation, therefore, there is a strong focus on the right to participate – who has it, and how it should be exercised.

Having established that rights to participate in decision-making represent a critical facet of climate justice, Paavola and Adger (2006) propose “equal participation for all” as a principle for fair adaptation to climate change. In their account of ‘fair adaptation’, they argue that a just response to climate change requires the ‘principle of putting the most vulnerable first’ alongside principles of avoiding dangerous climate change and taking responsibility for future harm, not only because this in turn “justifies progressive redistribution to those who are most in need” but also because it “provides a guideline for resolving dilemmas of

procedural justice, suggesting that all affected parties have rights, which have to be respected by recognition and participation” (p. 607). However, in so doing, they differentiate between mitigation and adaptation in terms of what constitutes fair and equal participation:

“The best way to shed light on equal participation is to discuss it in two central choice situations: determination of what constitutes dangerous climate change for the purpose of setting the safe maximum standard and determination of who is vulnerable for the purpose of allocating assistance. The former issue is pertinent to the international level of decision making and the latter one involves interactions between local, national and international actors” (Paavola and Adger, 2006, p.605-606).

Paavola and Adger provide a cogent account of the principle that all ‘affected parties’ should participate in decision-making, but in separating mitigation and adaptation into different spatial scales they effectively suggest that the ‘affected parties’ for mitigation are nation-states, while in relation to adaptation a range of other political constituencies are brought into view. If it can be taken that nation-states are the arbiters of forms of distributive climate justice, this argument may hold. However, once this boundary is subject to scrutiny, as above, it is no longer apparent that such a form of procedural justice would be adequate. Rather, both mitigation and adaptation begin to open up to a need for a multilevel framework for procedural justice that can account for ‘all affected parties’. As with distributive forms of justice, however, realising such principles in practice is fraught with challenges. For instance, Larsen and Gunnarsson-Östling (2009) draw on their experiences of creating scenarios for future sustainable urban development to note some of the fundamental tensions between both content and process values in participatory processes. Similarly, Few et al. (2007) draw on research on climate change and coastal zone governance in the UK and raise critical issues about the purpose of public participation in climate change policy. In particular they question what the result of a participation process would be if adaptation to climate change is a predetermined goal, and if stakeholders cannot be ‘trusted’ to decide collectively on an adaptive path because of competing priorities and short-term interests. In short, whilst procedural justice can be considered an essential component of any adequate formulation of climate justice, Dobson’s warning that we must not assume a common interest between the sustainability and justice agendas must be heeded:

“it is just possible that a society would be prepared to sanction the buying of environmental sustainability at the cost of declining social justice, as it is also possible that it would be prepared to sanction increasing social justice at the cost of a deteriorating environment.” (Dobson, 1998, p.3)

2.3 Bringing principles of climate justice to the city

Our review of the ways in which justice have been articulated in the climate change arena points to three critical concerns, each of which have significant implications for how we might understand urban climate change governance. First, responding to climate change requires the articulation of duties, or responsibilities, for mitigation and for adaptation. As discussed above, there has considerable debate concerning how and to whom such duties should be allocated, with most attention focused on the nation-state as the ‘container’ of climate responsibilities. This framing has been challenged both by those who have articulated the importance of individual entitlements in shaping our understanding of what constitutes a ‘just’ response to climate change, and those who have drawn attention to the ways in which responsibilities to act cannot simply be assumed to be continued within national boundaries. To address this challenge, Caney (2005) calls for “a fine-grained analysis which traces the contributions of individuals, corporations, states, and international actors and which accordingly attributes responsibilities to each of these” (p. 756). This has clear implications for urban climate change responses, suggesting that any efforts at mitigation need to take into account not only the city’s proportionate responsibility for climate change in relation to national and global communities, but also the degree of responsibility of individuals, communities and corporations within the city. By implication, such actors would also have the highest levels of responsibility for addressing adaptation, whether that be within their particular spatial context of the city or more broadly.

Second, our assessment suggests that developing socially and environmentally just climate change responses will require an engagement with the distribution of rights to benefits and the protection from risks. As argued above, in relation to climate change, rights are often considered as the opposite side to the responsibilities coin, and arguments for the responsibilities of some are often made in relation to the rights of others. In relation to adaptation, as outlined above, Paavola and Adger (2006) suggest that ‘fair’ responses should be guided by three principles: of avoiding harm; of taking responsibility for future changes; and of putting the last and most vulnerable first in order to ensure ‘progressive redistribution’

of benefits, in line with mainstream liberal theories of social justice (cf. Miller, 1995; Rawls, 1999 [1971]). Applying these principles is challenging enough at the international scale, but even more so at the urban scale because of structural patterns of advantage and disadvantage in cities. Implementing policies and initiatives explicitly designed to address the needs of the most vulnerable members of a population is a good way of promoting climate justice, but in the urban context simply identifying the most vulnerable communities within the city is a significant task. At the same time, the complex spatial and temporal interconnections within cities and between cities and their hinterlands highlight the fact that interventions and discourses intended to act on climate change may produce new forms of vulnerability and risk for marginal groups (Marino and Ribot, 2012).

Finally, in relation to procedural justice, debates have focused on the ways in which ‘all affected parties’ should be involved in decision-making. As intimated above, there are significant dilemmas in terms of both how to achieve this practically within the multi-level system of decision-making that characterises climate governance, and in terms of whether such forms of participation effectively serve as little more than glorified information campaigns or means of achieving particular political ends. Ensuring the participation of all affected parties, as broader debates on environmental justice have shown, is both a critical component of a just governance framework and a process which remains deeply contested, particularly at the local scale in which urban responses take place. Questions remain over which type of decisions different constituents should have engagement with, and how different social groups should be included in governing climate change. In short, the urban context brings to the fore the difficult questions of what forms of procedure and what type of participation count as *just* in the context of widely variegated forms of climate change response.

The principles of both distributive and procedural justice articulated in the international policy arena and in philosophical debates have vital relevance for how we understand urban responses to climate change. These debates suggest that while similar principles of distributive and procedural justice can be applied to both mitigation and adaptation, in practice notions of justice are articulated differently across these domains. They also begin to highlight differences in the ways in which justice is articulated, and what it comes to mean, when it is framed at different scales, from nation states to individuals. These notions of distributive and procedural justice, their different manifestations with regard to mitigation and adaptation, and the ways in which individuals and communities are framed as the subject

of justice can, we suggest, provide an initial framework through which to consider how justice is being articulated in the urban governance of climate change. In the next section, we turn to this task before coming back in the conclusions to reflect on the additional challenges that considering the urban scale may pose for how we conceptualise climate justice.

3. Articulating Climate Justice in the City

In order to understand the ways in which justice concerns are (or are not) being integrated into urban climate change governance, in this section we draw on the concepts of distributive and procedural justice to analyse how justice is articulated in the discourses of climate-related projects and plans in a selection of global cities. We focus on a set of global cities that have significance in relation to climate change, either in terms of their contribution to greenhouse gas emissions or because of particular vulnerabilities to the impacts of climate change. We define global cities as those that are significant either by virtue of their large population or their contribution to global economics or politics. Our sample included one hundred global cities chosen using a basket of indicators to reflect these variables (Castán Broto and Bulkeley 2013). Initial data gathering was conducted between June 2009 and June 2010, through a review of policy literature, grey material, websites and academic sources, and focused on identifying ‘climate change experiments’, or purposive projects or initiatives that seek to explicitly develop some form of trial or learning in relation to climate change, in these cities (Castán Broto and Bulkeley 2013). This search was conducted in five different languages (English, Spanish, Portuguese, French, and German) with each city being afforded roughly the same amount of research effort (two days per city in average) as a means of ensuring a fair level of coverage. This sampling approach allowed us access interventions taking place beyond strategy and plan making, and, in particular, to engage with initiatives undertaken by non-state actors in the city. However, it was not exhaustive, capturing an indicative sample of the sorts of actions that are being undertaken rather than a comprehensive list. In each city, both mitigation and adaptation initiatives were recorded, with the former classified in five different sectors: urban infrastructure; built environment; urban planning; transportation and carbon sequestration. The database recorded whether each initiative afforded any explicit consideration to social or environmental justice. An open definition of justice was adopted during the data collection process, including initiatives framed explicitly in relation to issues of justice or fairness but also those which included concrete measures to address any perceived social, economic or environmental inequality

In conducting our analysis of the ways in which notions of justice are part of the discursive construction of urban climate change governance, we first analysed the data gathered from 627 initiatives in our sample of one hundred cities to examine whether forms of distributive or procedural justice were included. To create a sample of cities in which to compare how justice concerns vary between adaptation and mitigation initiatives, we started from the basis of examining the climate change adaptation experiments in the sample, which are considerably fewer (76) than those concerned with mitigation (551). From these 76 cases, we identified discourses of justice in 23 initiatives from 10 cities. These 10 cities became the sample for the comparative study, and we identified discourses of justice in 29 mitigation initiatives within 8 of these cities. In analysing discourses of justice in each of these cases, we distinguished between distributive and procedural justice. In order to capture how these principles were being framed in each case, we also distinguished between initiatives in terms of whether they focused on individuals or collectives as the entities to and from which justice was due.

Our analysis of these climate change initiatives was complemented by an evaluation of climate mitigation, adaptation or adaptation plans. Initially, we reviewed planning activities in the selected ten cities. Of these, the field was narrowed to the 7 cities that had already developed some form of adaptation planning. These approaches included dedicated adaptation plans, a specified adaptation program contained within a climate action plan, and climate action plans that integrated elements of adaptation. We elected to select one city from each of these three plan types in order to capture the variety of ways in which adaptation planning is taking place. When we applied the criteria that plans should contain sufficient elaboration of adaptation to support analyses, be readily available for review, and written in one of the languages used in this study, three cities remained: Toronto, Quito, and Philadelphia. Each plan was reviewed for keywords and associated passages that suggested attention to considerations of justice. Once these were identified, the activity was noted along with who initiated actions, the group that was the target of this action, and whether discourses focused on procedural or distributive principles. In the rest of this section, we first outline the extent to which concerns for distributional and/or procedural justice are a feature of the emerging landscape of climate change initiatives, before considering in turn how principles of justice have been framed in the discourses of adaptation and mitigation in particular projects and plans.

3.1 Discourses of justice in climate change initiatives

Our analysis of climate change initiatives in global cities records 627 experiments in one hundred cities, fairly evenly spread in terms of geographic region (though this disguises important concentrations in particular cities) and concentrated in the urban infrastructure (energy, water, waste) and built environment (housing, commercial) sectors (Castán Broto and Bulkeley 2013; Table 1). Experiments are predominantly initiated by local governments (approximately 80% of the sample), but in the urban infrastructure and built environment sectors, private actors (for-profit) also play a significant role. Indeed, private actors play a significant role even where public actors are leading initiatives, predominantly through partnership arrangements (Castán Broto and Bulkeley 2013). Regression analysis helped to analyze whether urban climate change initiatives clustered around particular types of cities. The analysis showed that there is not a statistically significant association between city characteristics (e.g. population, GDP, density, population growth) and the emergence of relationships (Castán Broto and Bulkeley 2013). Urban climate change initiatives emerge in a variety of contexts within this sample of cities. However, the analysis suggested the possible relevance of city networks as driving initiatives in some cities (same reference). Further statistical analysis, following the same methodology, suggests that justice-related initiatives emerge independently from city characteristics such as population, GDP, density and population growth. In other words, across this sample, particular urban characteristics do not appear to determine whether or not notions of climate justice are or are not articulated in these forms of urban response to mitigation and adaptation.

[TABLE 1 HERE]

Very few of these experiments include an explicit concern for justice in their discursive construction, although these concerns are more prevalent in adaptation initiatives. Of the 551 mitigation experiments in the database, we find 131 (24%) make explicit mention of issues of justice, while in relation to adaptation we find 23 of the 75 experiments (31%) articulate some form of discourse of justice.

[TABLE 2 HERE]

Despite the small number of initiatives involved and the lack of association with specific urban characteristics, some patterns in how climate justice is being articulated at the city level

are evident. Table 2 shows that justice concerns are most frequent in North America, which resonates with the history of the environmental justice movement in the US which has later extended to other world regions. As might be expected, experiments led by community-based organisations and non-governmental organisations show the highest propensity to include aspects of justice – 56% and 35% respectively – while those initiated by municipal governments make explicit mention of these issues less frequently. Interestingly, matters of justice are often also articulated in those experiments led by private sector actors (31%). While within the discursive representation of these projects and initiatives, issues of justice do not feature prominently, but that where this occurs this is not restricted to the activities of one type of actor. On the basis of this data we selected key cities to examine discourses of justice in climate change mitigation and adaptation initiatives in more detail.

3.2 Discourses of justice and the urban governance of adaptation

Of the sample of 76 initiatives concerned with adaptation, in only 23 cases were principles of climate justice identified as being explicitly articulated (Table 3). We examined each case in order to analyse the ways in which principles of justice were being brought into the climate change domain.

[TABLE 3 HERE]

Of these cases, 22 of 23 formulated justice in broadly distributional terms, predominantly focused on the ways in which the outcomes of these interventions would provide either protection from harm or benefits. Rather than being considered in terms of duties of adaptation, here distributive justice was used to articulate the ‘rights to’ adaptation – of reducing burdens and of accessing goods. New York’s Coastal Storm Emergency Response Plan focuses on reducing vulnerability to storm events, for example, while in Paris the CHALEX scheme has developed a register and free phone telephone number to assist vulnerable people during heatwaves. In contrast, fewer of the initiatives focused on issues of procedural justice, with 10 of the 23 articulating an explicit concern with participation of ‘affected parties’. One example of an initiative that explicitly sought participations is the Birmingham Communities and Neighbourhoods Resilience Group, while in Belo Horizonte Projeto Switch, a project to develop an integrated approach to water management in the city, included the formation of a learning alliance involving wide range of stakeholders including neighbourhood groups and schools that were engaged in on-going dialogue and training.

Across these cases, climate justice was articulated both as accruing to individuals but also as a set of principles that needed to be afforded to communities within the city. Of the 23 cases, 16 considered notions of justice in individual terms, and the majority of these (15) were framed in terms of individual rights to protection from harm or the distribution of adaptation benefits. In Bangkok, the promotion of aquaculture adaptation measures has focused on three types of autonomous adaptation strategies applied by individual households, for example. In only six cases was procedural justice framed in individual terms. For example, in the Birmingham Resilience Group participation in local groups is regarded as a matter of individual engagement rather than community representation, although more frequently these two aspects of procedural justice were championed in tandem. Overall, 14 of the cases considered justice in community terms, all of which contained a discourse of the distributive effects of adaptation, and 6 of which also focused on matters of procedural justice. For example in New York, a pilot scheme to create a community planning process and “toolkit” to engage all stakeholders in community specific climate adaptation strategies was undertaken. Considering the total sample, in 4 cases we found that justice was framed in an extensive manner, including distributive and procedural elements, that needed to be considered in relation to both individuals and at a collective level (Projecto Switch, Belo Horizonte, the Program for Hydro-Meteorological Disaster Mitigation in Secondary Cities in Asia (PROMISE) in Bangkok, the Water Conservation Fund (FONAG) in Quito, and the San Francisco Bay Climate Change Adaptation Plan).

We found similar evidence for a focus on the distributive aspects of climate justice in relation to adaptation in the formal planning processes of Philadelphia, Toronto, and Quito, all of which have been developed in parallel to forms of climate change experimentation that are included in our analysis. In Philadelphia, formal climate change planning has involved the *Local Action Plan for Climate Change* (City of Philadelphia, 2007), the *Greenworks Philadelphia* plan (City of Philadelphia, 2009) and recent progress report as well as the *Philadelphia 2035 Plan* (City of Philadelphia, 2011). While these plans focus on mitigation, adaptation planning is closely related to responding to heat in the city and the early warning system. Despite mention of procedural justice, the emphasis in the plans is on distribution and on justice as rights and recognition. While city authorities are providing support to vulnerable populations, they are not assuming responsibility for the situation of such communities since climate impacts are seen as being the result of city location and longstanding patterns that

have emerged over time through the collective activity of the city and its residents. However, the municipality does acknowledge the needs of vulnerable populations and, as stated in the Local Action Plan, seeks to “identify and implement effective improvements to important existing [public awareness] campaigns, especially those that address the needs of vulnerable households” (City of Philadelphia, 2007, p. 17). Despite being aimed at the entire city, vulnerable populations (specifically the elderly, ill, and homeless) are noted as being an important consideration in the development of early warning systems for extreme heat situations. In this case, discourses of justice emerging in the ‘experiment’ with the heat warning system have provided a basis for the development of more formal adaptation planning in the city.

In Toronto, urban climate change planning has been articulated in three plans: *Change is in the Air: Climate Change, Clean Air and Sustainable Energy Action Plan* (City of Toronto, 2007); *Ahead of the Storm: Preparing Toronto for Climate Change* (City of Toronto, 2008) and *The Power to Live Green: Toronto’s Sustainable Energy Strategy* (City of Toronto, 2009). The plans in Toronto highlight the city’s framing of justice in distributive terms, but here explicit mention is made of the relationship between justice as responsibility and justice as rights. This is evident in *Ahead of the Storm*, which states:

“Toronto also has a special responsibility to those who are particularly vulnerable to climate change. Toronto’s homeless people are the most exposed to extreme weather. Isolated and low-income seniors are very susceptible to heat. Other at-risk groups include people with chronic and pre-existing illnesses, including mental illness, and children. Low-income people without savings or insurance have greater difficulty recovering from extreme weather events that damage their housing, belongings or health.” (City of Toronto, 2008, p.14)

In addition, and in contrast with Philadelphia, Toronto has a greater focus on forms of procedural justice. While we do not assess whether intended protocols are implemented, but there is mention of the intent to organize public meetings to discuss climate impacts and adaptation strategies, provide support to community groups working with vulnerable populations, and promote community engagement throughout Toronto’s three plans. Other programmes more directly assist those who do not have the resources to take action. For example, the city is subsidizing costs for installing backwater valves and sump pumps on

household sewer connections. Since many of the city's poor live in basements, they will benefit from this initiative. In Toronto, we find that urban climate change adaptation planning has involved multiple sets of discourses concerning justice, and this has taken place in tandem with the development of specific forms of experimental intervention in the city, where new technologies and actors have been enrolled to respond to climate change, suggesting that principles of justice are being reinforced across the planning and experimental domains. In Quito, the *Climate Change Strategy* (Municipality of the Metropolitan District of Quito, 2009) has also been developed alongside individual initiatives, and is also notable for its emphasis on participation and procedural justice. For instance, the document notes that the city held public meetings as part of its overall climate planning process. In addition, one of the core strategic objectives is Communication and Public Participation. The emphasis on procedure is reflected in a wide variety of programs already being implemented. For example, Youth Action on Climate Change is a program that relies on participatory processes to build capacity and the political agendas of youth movements and funding adaptation and risk management initiatives in marginalized neighbourhoods.

In analysing the differences between cities more closely, we find some patterns emerging in terms of differences between adaptation initiatives taking place in cities in the global north and those taking place in cities in the global south.

[TABLE 4 HERE]

Of the 23 cases, 18 were in the global north and five in the global south. Table 4 shows the number of initiatives (from the total number in that region) that capture particular dimensions of justice. The analysis shows that those in the global south appear to frame responses to climate change in relation to multiple dimensions of climate justice, whilst those in the global north are focused more directly on distributive justice (just outcomes) rather than procedural justice. In part, this can be explained by the focus of initiatives in the north and south. In particular, initiatives which address vulnerability to heat are mostly located in the global north are all concerned with protecting those individuals and groups most at risk (9/9), but none of them display evidence that they consider matters of procedural justice. In Philadelphia, neither the heat-related initiative nor the planning process framed justice in procedural terms. In Toronto, there appears to be a difference between the way in which procedural justice is included either as part of the plan making process where it is framed as

involving and informing ‘affected parties’, or in individual projects which are conducted in a more top-down manner, and participation is reduced to one-off processes of consultation largely achieved through the implementation of technical and financial measures.

In line with the overall findings of the database, this suggests that there may be some important differences in how climate justice is framed not only in different forms of climate governance, but also in terms of the actors involved. The adaptation cases in this sample are almost exclusively led by municipal actors. In fact, of the 23 cases, only three are led by non-municipal actors (2 CBO, 1 NGO). This is perhaps unsurprising given the dominance of municipal actors in our database. In the case of adaptation experiments, 34% of those led by municipal actors include justice considerations. However, it is interesting to note that the framing of justice discourses in the three initiatives – the Aquaculture adaptation project in Bangkok, Projecto Switch in Belo Horizonte, and the FONAG water conservation project in Quito - that are led by NGO and CBO actors all articulate multiple dimensions of climate justice, although municipalities are also leading experiments where multiple principles of justice are expressed. While the extent to which justice issues are of concern may vary with actor, we find that there are no clear patterns or associations between the type of actor involved and the ways in which climate justice is expressed.

3.3 Discourses of justice and the urban governance of mitigation

Having selected a sample of cities based on the presence of adaptation initiatives in which discourses of climate justice were being articulated, as described above, we then analysed the discursive representation of justice principles in mitigation experiments in the same cities (Table 5).

[TABLE 5 HERE]

As with the adaptation cases, we found that justice was formulated primarily as a discourse of the benefits of mitigation and how they might be distributed, although there were also articulations of the distribution of duties to reduce greenhouse gas emissions, with 25 of the 29 cases containing some principle of distributive justice. In New York, for example, the Intervale Green and Louis Nine House project focused on the provision of affordable, sustainable housing for socially and economically vulnerable groups, including green roofs, the use of recycled materials and energy efficient appliances. The ‘Footprints’ project at

Philadelphia Zoo demonstrates the ways in which discourses of responsibility for action are also bound up with discourses of distributive justice at the urban scale, focusing on the need to reduce the carbon footprint of the zoo and the city, as well as to protect endangered species globally. There were fewer cases where principles of justice were concerned with procedures and the inclusion of ‘all affected’ parties, with 13 of the 29 cases containing some form of discourse about individual and collective rights to participate in the projects that were being designed and implemented. Like the housing project in New York, in San Francisco the Plaza Apartments are also intended to provide affordable and sustainable housing, but have involved explicit involvement of neighbourhood residents in the design process. In broad terms, therefore, discourses of justice as they relate to mitigation are similar to those of adaptation, but with a more frequent emphasis on the distribution of rights than of responsibilities or concerns with ensuring ‘fair’ processes of decision-making.

In terms of the entities to which justice should be afforded, the discourses of mitigation initiatives included both individuals and communities within the city. Of the 29 cases, 19 related justice to some form of community, while 16 framed justice in relation to individuals. It is interesting to note that this is the reverse of the case of adaptation, where individuals were more frequently regarded as central to enacting justice, although the significance of this difference would require further research in a larger sample of cases. In those cases where individuals were central to discourses of climate justice, 14 of 16 were concerned with the distribution of rights and responsibilities, while 6 included some principle of procedural justice, displaying a similar pattern to the cases of adaptation. The Stechford Combined Heat and Power scheme in Birmingham targets individual residents and aims to reduce fuel bills, with little in the way of participation, while in New York, the green building finance scheme provides loans that can be paid off with the financial benefits of energy saving measures. In addition to seeking such forms of individual benefit, in Toronto the Towerwise scheme included the formation of the Towerwise Energy Efficiency Action Committee in order engage individual residents in the project.

Where justice was framed in relation to communities, 16 of the 19 cases were concerned with the distribution of either rights to benefit from mitigation actions or responsibilities for undertaking such action, while 12 framed justice in procedural terms, a greater proportion than in the case of adaptation suggesting that there may be a greater emphasis on inclusion and participation in mitigation experiments which focus on forms of collective benefit or

responsibility. Several of these projects targeted particular housing collectives or residential areas of the city, and embraced different dimensions of climate justice. For example, the Summerfield Eco-Housing initiative in Birmingham intended to create an eco-neighbourhood by de-converting a selection of buildings, developing an eco-office, fitting over 300 houses with solar panels and providing homes with a variety of eco measures including energy efficient boilers, insulation, sun pipes, energy efficient lights and grey water recycling systems. Overall, we found that 4 projects included multiple dimensions of climate justice (in addition to the Summerfield eco-housing project, this included the Plaza Apartments in San Francisco, New York's Weatherization Assistance Program and the Towerwise and Tower Renewal project in Toronto). There are a greater variety of actors involved in initiating mitigation projects than those concerned with adaptation, with 14 of 25 led by municipalities, 4 of 25 by private actors, 3 of 25 by NGOs and 4 of 25 by CBOs. We find that there is similarity with the adaptation cases in that there are no distinct relationships between the actors involved and the discourses of climate justice expressed – while two of those that are led by CBO/NGOs include multiple framings of climate justice, this is also the case in initiatives that are led by municipalities.

Turning to the three case-studies of climate change planning processes, Philadelphia, Toronto and Quito, we likewise see a clear emphasis on the distribution of rights to benefit from addressing climate change. In Philadelphia, the early emphasis was on mitigation, as represented by campaigns to reduce greenhouse gas emissions and to improve assistance for household weatherization through energy audits and efficiency initiatives. The discourse of rights as justice is reflected, for instance, in the context of the weatherization program where the needs of low-income families are acknowledged and where efforts are being made to ensure that existing programs that provide these services should “be better funded to enable more households to be served and achieve greater energy savings in each household” (City of Philadelphia, 2007). Forms of procedural justice are included in the planning process, but primarily in education and outreach activities. For instance, the Local Action Plan has the goal of strengthening “community-wide campaigns to increase public awareness and participation in sustainability and greenhouse gas reduction efforts” (City of Philadelphia, 2007), suggesting a degree of instrumental intention in terms of enrolling publics in policy intentions. In Toronto, in contrast, forms of procedural justice are more explicit and, at least discursively, seek the active engagement of ‘affected parties’ in climate change mitigation planning. Procedural justice is exemplified, for instance, in the plan to include marginalized

or socially excluded residents in the annual review of *The Power to Live Green* while in city risk assessments distribution is reflected in the ways in which city programs will benefit groups at risk. Some of these initiatives are citywide. This is the case, for example, with the Live Green Toronto Program, where USD20 million has been allocated to support climate action. While the program is open to all neighbourhood and community groups, those from disadvantaged areas have equal access to funds.

In Quito, both of the mitigation-related initiatives were led by the municipal government, and both carried over this focus on procedural justice, aiming to promote awareness, provide information to citizens, build capacity, and instil participatory processes in climate change governance. Distributive justice did not figure nearly as prominently in Quito as in the two North American cities. This may reflect the different challenges being faced by the cities in responding to climate change, but also might be a factor of the different framings of climate justice which have historically been pursued by so-called ‘developed’ versus ‘developing’ countries. Perhaps it is indicative of the fact that before distributive justice can be explicitly tackled, a wider range of procedural obstacles must be overcome, most prominent amongst them the challenge of achieving public ‘buy-in’ to the notion that action must be taken, and institutions for facilitating the on-going participation of the range of groups present within civil society.

When we compare the ways in which discourses of climate justice varied between mitigation initiatives that were conducted in cities in the north and in the south, we can also find some interesting points of comparison with adaptation.

[TABLE 6 HERE]

Of the 29 cases considered, 4 were in the global south and 25 in the global north (Table 6). While in the adaptation cases, forms of procedural justice were proportionally more frequently articulated in those cities in the global south, this was not the case for mitigation where procedural justice was less frequently articulated across all cities whether in the north or the south. The more marked difference between initiatives in the north and south is their focus on individual or collective forms of justice. In those that are taking place in the south, the emphasis is on providing collective benefits, while in the north the focus is on benefits that accrue to individuals. This mirrors the adaptation case, where in the north the focus is on

individual forms of protection from vulnerability, while in the south the focus is on collective protection. Principles of climate justice in the north appear to be framed in terms of individually-oriented benefits and responsibilities (such as financial benefits or health benefits), whilst in the south it collective forms of benefit are stressed (such as benefits for particular social groups or areas of the city).

4. Conclusions

Although recognised as critical at the international level, very few analyses of urban responses to climate change have considered their justice dimensions. Yet justice *is* being articulated in the urban climate governance domain, though our analysis suggests that issues of distributional and procedural justice are made explicit in only a minority of climate change experiments (23/75 adaptation experiments and 131/551 mitigation experiments). In general terms, justice is most often articulated in initiatives in North America, and those led by non-governmental actors.

In urban adaptation initiatives, we find that justice is principally framed in distributive terms as the right to be protected from climate harm or to benefit from the ‘goods’ of adaptive measures. There is less emphasis on matters of procedural justice. Interestingly, there was a strong division between those initiatives in the north and south on this matter. Procedural justice was more likely to be a concern in initiatives in the south, whereas responses in the north (often focused on adaptation to heat) were more technocratic in their orientation. The framing of climate justice displayed no notable bias towards either individuals or communities. Our analysis of climate plans in Philadelphia, Toronto and Quito illustrates how some of these different discourses are also present in climate plans. In each case, we found discourses of distributive justice for individuals and communities. In Toronto and Quito, we also found a strong sense of procedural justice, although when the plans are examined in light of actual initiatives, in the former it appears that this logic is not always followed through in particular projects and experiments, where more instrumental and technical logics come to dominate.

In terms of mitigation, we found a similarly strong focus on issues of distributive justice, primarily articulated in terms of who had rights to enjoy the benefits of mitigation, rather than responsibilities for action. Issues of procedural justice were articulated, but less frequently. An intriguing difference in the cases examined here is that there was a greater emphasis on

notions of justice in relation to urban collectives than to individuals, the reverse of our analysis of the adaptation cases. In Philadelphia and Toronto, we found that discourses of justice were being articulated in terms of the rights of poorer and excluded communities in the city to benefit from mitigation activities, while in Quito this was framed primarily in terms of inclusive forms of participation, suggesting that far from being framed only as a matter of economic development or carbon economy, there is space within urban climate governance for more progressive politics.

Across both the mitigation and adaptation arenas, we see an interesting difference in that initiatives in the south there is a greater emphasis on collective risks and benefits, while in the north the emphasis is on the individual as the entity to whom and for whom justice is due. In part, this could be explained with reference to the basic assumptions of western philosophy that justice is something concerned with individuals, though this has been challenged with more recent appeals to communitarian conceptions of justice (Miller and Walzer, 1995; Walzer, 1983). It could also reflect the more general tendency in the international realm for the south to appeal to the collective responsibility of the north for climate change as a reason for both greater financial contributions to mitigation and assistance with adaptation, at the same time as the north marshals more individualistic notions of justice to highlight the more limited responsibility of present generations for the actions of previous generations (see Okereke, 2006).

Our analysis demonstrates that the ethical principles of how responsibilities and benefits from addressing climate change should be shared internationally, along with broader notions of distributive and procedural justice, have relevance in the urban arena. More or less implicitly, notions of duties, responsibilities, benefits, burdens, access, inclusion, obligation and legitimacy have become enmeshed in climate politics as articulated in both specific interventions and in the broader policymaking and planning processes that comprise urban responses to climate change. However, the universal notions of justice that are often implied in such terms when they are used internationally and to relate to the political community of the nation-state on the one hand and directly to the individual on the other, are found wanting when it comes to understanding how such discourses are being articulated and contested in practice. Our analysis suggests that within urban discourses of climate justice there is recognition of differential vulnerability, responsibility and ability of multiple forms of community within the city in relation to climate change. Further, by analysing discourses of

justice within both climate change experiments and planning processes, we also suggest that there is a need to move beyond ideal types or principles to consider how climate interventions may serve to reproduce or challenge existing inequalities in the city, producing or enhancing forms of social stratification (Marino and Ribot, 2012).

Together, these findings lead us to three important implications for work on climate justice and on the urban politics of climate change. First, that notions of climate justice cannot be spatially agnostic; matters of distributive and procedural justice need to be related to the political arenas, economies and social configurations of which they are part. In other words, urban responses to climate change need to consider not only whether they may be just in a global sense, but also the ways in which they serve to entrench or address questions of injustice within urban arenas, economies and communities. Second, that it is critical to examine not only the general principles of climate justice, but the ways in which such principles are articulated in particular instances and, further, how these are practiced and contested both discursively and materially. Third, that a focus on the urban arena enables us to engage with the ways in which the production and reproduction of political economies/ecologies shape the constitution of responsibilities and rights in response to climate change and the ability or culpability to participate in decision-making. We see considerable potential here in building on work such as Nancy Fraser's which explicitly articulates a post-distributive framing of justice around the notion of 'recognition' (Fraser, 1997) to move beyond discursive representations to engage with how climate justice is actually practiced and embedded in the city. We suggest that future research in this field, by moving from universal principles of climate justice to its articulation in particular places, and by examining the politics of discourses and of practices, can move the debate forward and enable us to understand the possibilities and potential for a more just urban climate politics.

References

- Adger, W.N., Paavola, J., Huq, S., Mace, M.J. (2006) (Eds.) *Fairness in adaptation to climate change*. MIT Press, Cambridge MA.
- Agyeman, J., Bullard, R. D. and Evans, B., (eds.) (2003). *Just Sustainabilities: Development in an Unequal World*, The MIT Press, Cambridge.
- Betsill, M.M., Corell, E., (2008) *NGO Diplomacy: The Influence of Nongovernmental Organizations in International Environmental Negotiations*. The MIT Press, Cambridge.
- Boyd, E., Goodman, M.K. (2011) The Clean Development Mechanism as ethical development?: Reconciling emissions trading and local development. *Journal of International Development* 23, 836-854.
- Büchs, M., Bardsley, N., Duwe, S. (2011) Who bears the brunt? distributional effects of climate change mitigation policies. *Critical Social Policy* 31, 285-307.
- Bulkeley, H. (2001) Governing climate change: the politics of risk society? *Transactions of the Institute of British Geographers* 26, 430-447.
- Bulkeley, H., Newell, P. (2010) *Governing Climate Change*. Routledge, Abingdon.
- Butler, C., Parkhill, K.A., Pidgeon, N. (2011) Nuclear Power after Japan: The Social Dimensions. *Environment: Science and Policy for Sustainable Development*, 53, 3-14.
- Caney, S. (2005) *Cosmopolitan Justice, Responsibility, and Global Climate Change*. Leiden *Journal of International Law* 18, 747-775.
- Caney, S. (2010) Climate change and the duties of the advantaged. *Critical Review of International Social and Political Philosophy* 13, 203-228.
- Castán Broto, V. and Bulkeley, H. (2013) A survey of urban climate change experiments in 100 cities, *Global Environmental Change*, Volume 23 (1): 92-102
- City of Philadelphia (2007) *Local Action Plan for Climate Change*. Sustainability Working Group.
- City of Philadelphia (2009) *Greenworks Philadelphia*. City of Philadelphia, Mayor's Office of Sustainability.
- City of Philadelphia (2011) *Citywide Vision: Philadelphia 2035*. Philadelphia City Planning Commission, Philadelphia.
- City of Toronto (2007) *Change is in the Air: Climate Change, Clean Air and Sustainable Energy Action Plan*. City of Toronto, Toronto.
- City of Toronto (2008) *Ahead of the Storm: Preparing Toronto for Climate Change*. City of Toronto, Toronto.
- City of Toronto (2009) *The Power to Live Green: Toronto's Sustainable Energy Strategy*. City of Toronto, Toronto.

- Dobson, A. (1998) *Justice and the Environment: Conceptions of Environmental Sustainability and Theories of Distributive Justice*. Oxford University Press, Oxford.
- Few, R., Brown, K., Tompkins, E.L. (2007) Public participation and climate change adaptation: avoiding the illusion of inclusion. *Climate Policy* 7, 46-59.
- Fraser, N., (1997). *Justice Interruptus: Critical Reflections on the “Postsocialist” Condition*, Routledge, New York, 241 pp.
- Füssel, H.-M. (2010) How inequitable is the global distribution of responsibility, capability, and vulnerability to climate change: A comprehensive indicator-based assessment. *Global Environmental Change* 20, 597-611.
- Giddens, A. (2009) *The Politics of Climate Change*. Polity Press, Cambridge.
- Grubb, M. (1995) Seeking fair weather: ethics and the international debate on climate change *International Affairs* 71, 463-496.
- Grubb, M. (1999) *The Kyoto Protocol: a guide and assessment*. Royal Institute for International Affairs and Earthscan, London.
- Gupta, A. (2010) Transparency in Global Environmental Governance: A Coming of Age? *Global Environmental Politics* 10, 1-9.
- Harris, P.G. (2010) Misplaced Ethics of Climate Change: Political vs. Environmental Geography. *Ethics, Place and Environment* 13, 215-222.
- Jagers, S.C., Duus-Otterström, G. (2008) Dual climate change responsibility: on moral divergences between mitigation and adaptation. *Environmental Politics* 17, 576-591.
- Larsen, K., Gunnarsson-Östling, U. (2009) Climate change scenarios and citizen-participation: Mitigation and adaptation perspectives in constructing sustainable futures. *Habitat International* 33, 260-266.
- Marino, E., Ribot, J. (2012) Special Issue Introduction: Adding insult to injury: Climate change and the inequities of climate intervention. *Global Environmental Change* 22, 323-328.
- Miller, D., (1995) Introduction, in: Miller, D., Walzer, M. (Eds.), *Pluralism, Justice, and Equality*. Oxford University Press, Oxford, pp. 1-16.
- Miller, D., Walzer, M., (1995) *Pluralism, Justice, and Equality*. Oxford University Press, Oxford
- Municipality of the Metropolitan District of Quito, (2009) *Quito Climate Change Strategy*. MMDQ, Quito.
- O’Brien, K.L., Leichenko, R.M. (2010) Global Environmental Change, Equity, and Human Security, in Matthew, R.A, Barnett, J., McDonald, B., O’Brien, K. (Eds.) *Global Environmental Change and Human Security*. MIT Press, Cambridge MA, 157- 176.

- Okereke, C. (2006) Global environmental sustainability: Intragenerational equity and conceptions of justice in multilateral environmental regimes. *Geoforum* 37, 725-738.
- Paavola, J., Adger, W.N. (2006) Fair adaptation to climate change. *Ecological Economics* 56, 594-609.
- Rawls, J. (1999 [1971]) *A Theory of Justice*, Revised ed. Harvard University Press, Cambridge MA.
- Roberts, J.T., Parks, B.C. (2007) *A climate of injustice: global inequality, North-South politics and climate policy*. MIT Press, Cambridge MA.
- Schlosberg, D. (2007) *Defining Environmental Justice: Theories, Movements and Nature*. Oxford University Press, Oxford.
- Shrader-Frechette, K. (2002) *Environmental Justice: Creating Equality, Reclaiming Democracy*. Oxford University Press, Oxford.
- Shue, H. (1999) Global environment and international inequality. *International Affairs* 75, 531–545.
- Tol, R.S.J., Downing, T.E., Kuik, O.J., Smith, J.B. (2004) Distributional Aspects of Climate Change Impacts. *Global Environmental Change* 14, 259-272.
- United Nations, (1992) *United Nations Framework Convention on Climate Change*. UNFCCC Secretariat, Bonn, Germany.
- Walker, G. and Bulkeley, H., (2006). Geographies of environmental justice, *Geoforum* 37, 655-659.
- Walzer, M. (1983) *Spheres of Justice: A Defense of Pluralism and Equality*. Basic Books, New York.
- World Bank, (2010) *Cities and Climate Change: An Urgent Agenda*. The International Bank for Reconstruction and Development / The World Bank, Washington DC