

**Crafting rules by discourse:  
Analyzing urban institutional changes in the face of climate change**

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*Abstract*

The institutional analysis of the management of common pool resources (CPRs) has a strong focus on local/regional cases (e.g. forests, local water bodies), and it concentrates on ‘social statics’ (Comte), due to the comparative nature of analysis. With climate change, institutional analysis of CPRs is confronted with a double challenge: (1) we have to address cross-scale issues, linking the global to the local level, and encompassing multi-level governance questions. (2) We need to think much more in terms of social dynamics, addressing problems of actual rule-making (and rule-change) in the face of expected (future) socio-environmental problems. In this paper we will try to face these challenges by focusing on urban climate policies, including both adaptation and mitigation. By comparing German (Potsdam, Berlin) and Indian (Hyderabad, Delhi) cities that deal with climate change at various levels and in different contexts of governance, we will particularly address (1) what are the problems (experienced and anticipated climate change impacts) these cities are confronted with, and who does bring them how to the fore? (2) What set of actors do propagate climate policies in these cities, what are their interests, rule and resource endowments? (3) In what action arenas do these actors operate, and more particularly: how does their interaction help to create new (sub-) arenas of the emerging field of urban climate policy? (4) How can these actors, embedded in local and national institutions and governance modes, create new rules (if needed), and what kind of discourses do they use in order to do so? (5) Is there any link between the institutional dynamics and the outcome in terms of changed patterns of resource use and greenhouse gas emissions? The paper will try to answer these questions by own case study research in different projects. Methodologically, we will start from Elinor Ostrom’s institutional analysis and development framework, but modify it based on our own research experiences, which was inspired by Anthony Giddens’ thesis of the ‘duality of structure’, which we interpret as an entry point for institutional change. We conclude by linking the local level back to the larger global picture, arguing in favor of an institutional opening of the UNFCCC process to the level of local climate policies that we can observe emerging across the planet.

## 1. Introduction: Cities and the global common climate

It is a widely held—and very plausible—assumption that global environmental problems should be solved by global environmental institutions. If ‘humankind’ as a pseudo-collective actor can be held responsible for the emission of greenhouse gases (GHGs), it seems reasonable—both from a physical and from a moral sense—that global institutions of that same humankind should be designed in order to reduce these emissions. Solving this problem thus requires collective action. To avert dangerous climate change, many actors at diverse levels need to make (sometimes) costly decisions to reduce GHG emissions. But incentives for free riding behavior are strong. Every one benefits from reduced emissions even if they do not contribute any effort themselves (Cole 2008, Sandler 2004). Solving the climate change problem thus requires an enforceable global treaty, together with a market for carbon emissions (Carraro 2003, Nordhaus 1994). Given the multitude of contributors to anthropogenic climate change (‘humankind’), nation states seem the natural agents for such a treaty, reducing the number of negotiating parties substantially, while at the same time mandating agents with clear legal authority and sufficient financial resources. These assumptions led to the creation of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and the conclusion of the Kyoto Protocol in 1997, enabling states—among other things—to create carbon dioxide markets. The European Union’s Emission Trading Scheme (ETS) is a functioning example, based upon the Kyoto Protocol, and other countries and regions have been following, or plan to do so (Fankhauser and Campbell 2010a, b).

On the other hand, what sounds so convincing in theory—very large numbers of anonymous, uncoordinated actors invite free-riding—is not always so in practice. Empirical studies and meta-analyses of communities that are threatened by free-riding can show: While many instances of free riding are observed in the array of empirical cases, a surprisingly large number of small- to medium-scale groups facing collective-action problems do cooperate (Dietz et al. 2003, Poteete et al. 2010). Even in the absence of a treaty, or a state, larger groups of actors can cooperate and contribute to a common good—including the improvement of a common pool resource—if some institutional preconditions have been met, such as the establishment of mutual trust, the transparency of rules and procedures, the evidence of beneficial outcomes, or equity in participation on decision-making processes.

While global climate policy has received a lot of scientific and public attention—in fact more than any other (global) environmental issue (Anderson 2009), the relatively meager results from the latest UNFCCC Conference of the Parties (CoP) meetings in Copenhagen (2009) and Cancún (2010) clearly reveals the limits of the international climate regime (den Elzen et al. 2011). Even if national governments are leading negotiations of climate change agreements at the international level, mitigation and adaptation activities are being implemented by numerous other actors at the regional, sub-national (e.g. state/provincial) and local levels (cf. Pollak et al. for U.S. states). The sustained attention of policy-makers, the scientific community and the media to climate

policies at the international level has mainly led them to overlook these other equally important levels of climate intervention. In this paper, we would like to focus on the city level.

While cities account only for less than 3 percent of the Earth's land surface, they are home to more than 50 percent of the world population, or about 3.5 billion people. By 2030, 4.9 billion people might live in cities, almost 60 percent of the world population (UN Habitat 2011). In addition, cities are the economic 'growth machines' (Bairoch 1988).<sup>1</sup> Due to their functional and spatial density, they are home to both business and R&D clusters, resulting in large portions of national GDP generated within cities (Bettencourt et al. 2007). As hotspots of both population density and economic activity, cities account for a substantial share of global GHG emissions. Accounting these emissions is not an easy task, not only because the definition of 'city' varies across countries and political city boundaries do often not reflect functional connections in space, but also due to the complexity of production and consumption systems. While it is easy to measure and attribute GHG emissions from a municipal power plant, serving urban dwellers exclusively, the case is more difficult with traffic emissions, e.g. from inhabitants of a suburb regularly commuting to the inner city. And GHG accounting gets really messy when it comes to lifecycle emissions embodied in, say, the buildings of a city, or the carbon footprint of the food consumed there. Depending upon the method and scope of accounting, cities are responsible for 30-80 percent of global GHG emissions (UN Habitat 2011).

Interestingly, the carbon footprint of urban dwellers differs from the one of its rural or suburban counterparts. In most developed countries, with a high general standard of living, city dwellers have a lower per capita carbon footprint than the national average, while in developing countries the opposite is true (Dodman 2009, Satterthwaite 2008). But even within both classes there is a substantial variance of GHG emissions, so that equally 'rich' urban dwellers in Tokyo, Houston, New York or London do have quite different individual carbon footprints. It is mainly the 'urban form' that is responsible for this variance: the pattern of settlements, the energy efficiency of buildings, the length of the road network, the share of public transport etc. All of these factors that influence the carbon footprint of a city via the urban form depend on collective decisions—either as aggregated outcome of individual choices under collective boundary conditions, or as direct outcomes of collective choices, such as urban planning or taxation policies.

With the growing role and responsibility for the global common climate, cities have started to establish local level climate policies. But why should cities initiate policies to mitigate against GHG emissions if the own contribution of an individual city to global warming is marginal? Why should especially cities in developing countries with high shares of poor inhabitants opt for climate policies, given the actual and historical

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<sup>1</sup> For Indian states, there is a clear positive correlation between urbanization rate and per capita income level (HPEC 2011: 12).

responsibility of the developed world? What institutional changes are required in order to establish local climate policies?

We try to approach these questions by using an analytical framework that looks at the institutional aspects of sustainability, and try to apply it to an urban context. And we will focus on deliberate institutional change by public discourses. The rest of the paper is organized as follows. In the next section (2) we will introduce the Institutions of Sustainability framework and apply it to the urban context. In order to underline the dynamical role of institutions in the rather new—and not yet fully established—area of urban climate policy we would then (3) focus on institutional change and urban transformation processes by discourses. In order to illustrate our approach, we would then (4) refer to cases of urban climate policy in India and Germany. The final section (5) gives an outlook with respect to theoretical perspectives.

## **2. Local Climate Policy: An Institutional Framework**

The long history of urban planning shows how rapidly social and technological changes as well as visions of a future society have made their way to the design of cities (Hall 2003). Environmental issues are central to cities. The history of the city is in large parts the history of governing environmental side-effects of the interactions that many people create, working and living together on a densely populated area (Benevolo 1980). In fact, urban legislation has, from its beginnings in early Mesopotamian cities onward, constantly been dealing with issues like water and air pollution, noise, food safety, and public health effects of a contaminated urban environment. It is not an overstatement to say that urban environmental policy preceded the formation of national environmental policies by centuries. But with climate policy things are different.

Local climate policy is a rather new policy area, and in many cities both in the developed and the developing world it is not yet established. Even where cities can look back to a longer history of local climate policy, it is a relatively weak, if not marginal policy domain (Bulkeley and Betsill 2003). In part, this relative weakness is due to the fact that anthropogenic climate change in general is a relatively new, and heavily science depending issue (Weart 2003). But while nation states and international organizations were rather fast in incorporating climate change into their environmental policy portfolios, cities were much less active. The main reason for this may be that city decision makers and administrators did not see a direct link between the transactions of cities with their environments and the global climate. Nevertheless, more and more cities engage in climate protection and adaptation measures. Many of them join climate policy city networks such as the Climate Alliance (see <http://www.klimabuendnis.org/>) or the Local Governments for Sustainability Organization (ICLEI, see <http://www.iclei.org/>).

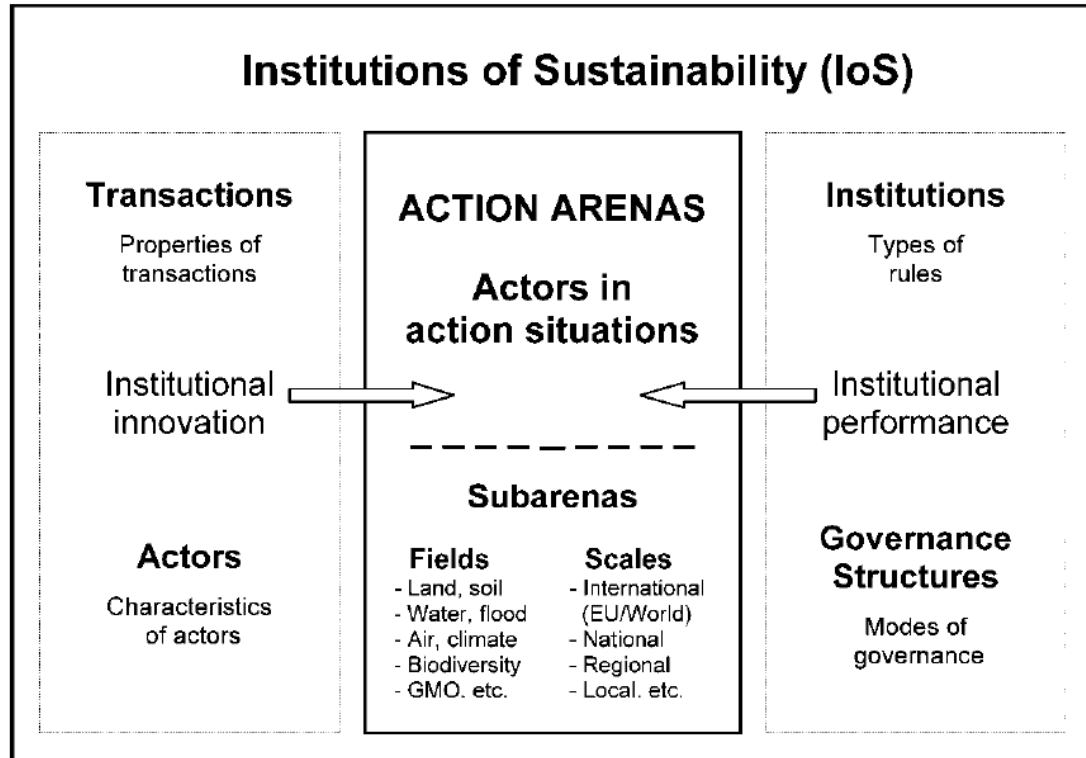
In order to better understand this recently emerging area, we would like to propose an analytical framework, termed the Institutions of Sustainability (IoS) approach (Hagedorn et al. 2002, Hagedorn 2008). It has been developed in the wider context of the economic analysis of (non-) sustainable use of natural resources by human communities,

e.g. in the field of agriculture and forestry. Elinor and Vincent Ostrom's work has been a constant inspiration for our own endeavor, dating back to the 1950s (Ostrom 1953). Lin Ostrom's proposition of an Institutional Analysis and Development (IAD) Framework (Ostrom 1990, 2005) is particularly important for our thoughts.<sup>2</sup>

In the widest sense, local climate policy as an issue of the social sciences can be seen as an area of *social action* (Weber 1978), i.e. as a field constituted by the interconnected and mutually oriented actions of individual and corporate actors in their institutional and biophysical environments. Weber, as most advocates of the theory of social action, has focused exclusively on intra-social processes, especially in the 'meaning' that actors empirically or ideally attach to 'physical' actions, while natural resources and processes are regarded as socially 'meaningless', and have thus been rendered as mere boundary conditions of social action theory. We tend to correct this view by arguing that natural or semi-natural conditions and resources play a central role for social interactions. While it remains true that they are not made up from 'meaning' in a narrow sense, they form—as interpreted resources and constraints—form a constant and central part of social actions and, in particular, of transactions as sub-sets of actions that involve human actors and their biophysical environments.

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<sup>2</sup> The attempt made in the current paper—translating the IoS framework into an urban context—can be regarded to some degree as a coming-home of IAD, as Lin Ostrom has started her work with a comparative analysis of the institutional settings of urban service provisioning (namely policing) in the U.S. (Ostrom et al. 1978).



*Fig. 1: The Institutions of Sustainability Framework (Hagedorn et al. 2002, Hagedorn 2008)*

A natural starting point for any analysis of social action is to think about the *actors* involved (cf. Fig. 1). Besides human individuals we consider corporate actors (such as organizations) as being capable of social action. Both are interlinked, and it is already here that rules come in:

“We may summarize the reciprocal relation between natural persons and collective actors: (i) Natural persons cannot constitute a collective actor unless there are rules and practices constituting it; (ii) a collective actor cannot will and act unless there are natural persons who perform the underlying ‘natural’ or basic acts according to some specific rules and practices.” (Lagerspetz 2004: 234)<sup>3</sup>

Although objects and processes of the (semi-) natural world are key to our understanding of transactions, and are a main concern when it comes to the sustainability

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<sup>3</sup> In other words: the IoS framework offers analytical distinctions, not separate real entities. For Hegel, in distinction of methodological individualism, corporate actors can exist according to the given specification. In his *Philosophy of Right* (Hegel 1991), ‘corporations’ are corporate actors that mediate between self-interested individuals and the coordination mechanism of the market on the one hand, and the state as a collective actor oriented towards the common good on the other. For him it is important to see that the self-organization of self-interested individuals according to shared interests (such as in professional organizations, trade unions, or cooperatives) does transcend mere self-interest already in the sphere of market transactions. The meta-institution ‘state’—a limited and evolutionary interpretation of the common interests of a community—can only emerge because of these ‘seeds’ of solidarity *within* a world of egoism (Reusswig 1993).

of transaction systems, we do not count them as actors.<sup>4</sup> As human action inevitably is dependent upon natural systems and processes, their characteristics influence the course of action via various interconnections and feedbacks, some of which are beyond the scope of knowledge and/or (direct) influence of actors. The wide area of unintended consequences of intentional action lies at the core of social theories since their beginnings in the late 19<sup>th</sup> century. Yet for most of their times, the social sciences have thought that these consequences would only occur in the social world. But given (i) the natural resource dependence of human action, and (ii) the systemic linkages and complexities of natural systems involved, one of the main aspects of human action is the causation of unintended ecological side-effects, which in turn offer opportunities and pose challenges to new actions. World history is full of examples of human action systems that have led to unintended and eventually disastrous environmental outcomes (Diamond 2005, Ponting 1993).

Actors nevertheless are intentional units, i.e. they have goals (and thus interests) and use knowledge about the world. They do dispose of resources, both social and physical, serving as assets, but also bringing about specific constraints. A herd of useful animals—e.g. cattle—is such an asset, providing actors with a constant stream of milk, meat, dung (manure) and the like. Many societies attribute social honor according to the number of cattle a person, family or clan disposes of. However, due to the biophysical regularities of a finite world, a constant flow of return from a natural asset inevitably requires specific investments made by the capital owner.<sup>5</sup> In other words: natural resources come with constraints or restrictions, not unlimited or unconditioned. *If* humans want to utilize and benefit from natural systems, they *have* to follow certain rules. Otherwise the resource turns useless, if not a damage. Actors value not only specific outcomes of transactions, they also value specific states of the world, even if these states can only partially be influenced by their own actions. And, finally, actors differ in their relative power, i.e. in the character and amount of their ability to influence others or even to force their own will onto others—whatever the reason for that ability may be.

Actors find themselves in *action arenas* where ‘...participants and an action situation interact as they are affected by exogenous variables [...] and produce outcomes that in turn affect the participants and the action situation’ (Ostrom 2005: 13). An *action situation* occurs ‘whenever two or more individuals are faced with a set of potential actions that jointly produce outcomes...’ (Ostrom 2005: 32). Action situations are ‘located’ (or ‘nested’) in action arenas, and at the same time reproduce the latter. While the action situation is concrete with respect to time, space, actor and type of action, action arenas are more abstract, yet constitutive social areas in which actions take place.

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<sup>4</sup> The Actor Network Theory (ANT) in environmental sociology deliberately treats human actors and biophysical objects as equally important and terms them ‘actants’ (Latour 1993).

<sup>5</sup> It is worth noting that the Latin word ‘capital’ originates from the number of heads (*caput*) of a herd of animals. The original model of (human made) capital growth is thus the natural growth of a (managed) natural system.

Although not all actions are automatically associated with transactions, we are primarily interested in the latter because they present socially relevant processes by which goods and services, resources and amenities, and damages and nuisances are allocated. A ‘situation’ is inevitably an *interpreted* situation, and one core element of social action is to come to a shared definition of the situation. Observers—including scientific ones—can come up with different interpretations of situations. Most situations involve biophysical elements of various degrees of complexity, such as natural resources or the built environment.<sup>6</sup>

Action situations can also be characterized by the set of participants, the possible positions they can fulfill, the set of meaningful and allowable actions, and the potential outcomes of a situation. Actions in situations lead to outcomes—both intended and unintended ones—and these outcomes in turn can be defined as costs and benefits of actions, serving as incentives and deterrents for different actors.<sup>7</sup> Of course this payoff structure of situations is also subject to interpretation and manipulation, i.e. actors can try to shift negative outcomes to others (or the environment), and to utilize beneficial ones. The frequency by which situations occur does also differ according to transactions in action arenas. It is important to note that both the action situation and, even more so, the action arena comprise the dimension of publicity.

Given the complexity of the (social) world, action arenas can, and usually do, be further divided into sub-arenas, according to the *fields* of action and the *scale* these actions play out. In our context, the action arena of urban climate policy (mitigation) consists of at least four sub-arenas:

- Urban planning<sup>8</sup>
- Energy provisioning and distribution
- Traffic and mobility
- Awareness raising, communication, participation

Most of these sub-arenas refer to well-established roles and responsibilities of local authorities, such as urban planning or the provisioning of energy or transportation services. In the case of awareness raising and communication, climate issues do find it much more difficult to find a ‘hook’ in already existing administrative routines.

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<sup>6</sup> There is a clear difference between a pristine rain forest and the central business district of a globalized megacity. But for actors they are both part of the situation they are confronted with. And they both are—in different forms and to different degrees—affected or even shaped by human action.

<sup>7</sup> Benefits from transactions taking place in action arenas can broadly be subdivided in direct benefits (e.g. improved availability and quality of water within a watershed management system) and indirect benefits (e.g. better groundwater recharge in a wider area), and the success of institutions for the management of common pool resource depends, among other things, from the size distribution of these two sorts of benefits (Venkatchalam 2011).

<sup>8</sup> We would like to include the management of water and waste flows to urban planning, but one could—depending upon the individual relevance of these domains—also create separate sub-arenas.



If we limit ourselves to the city level, the relevant scales are (i) the whole city as an administrative unit (e.g. as subject to decisions taken by Lord Mayors or city councils), (ii) geographical sub-units such as particular quarters, and (iii) the national and/or international network of cities. Other levels, e.g. the level of regions/states or nation states are very important, but are external compared to the internal scale of the urban system itself.

Cities as actors in local climate policy can play different roles<sup>9</sup>:

- *Consumers and precursor.* Cities operate as purchasers in markets and as consumers of goods, and thus could use their power to ‘green’ the market. Public buildings can serve as a publicly visible example, a vanguard by which others are motivated and credibility is lent to public policies.
- *Planner and regulator.* Urban planning and traffic planning are among the two core competences of cities, and can be transformed in order to reduce energy use and/or to promote renewable energy. Regulation and taxes can be utilized to change the behavior of individuals and firms in a low-carbon future.
- *Contractor and provider.* Cities or publicly controlled utilities provide a multitude of services, many of which have a direct (e.g. energy) or indirect (e.g. water, waste) link to a cities’ carbon footprint.
- *Advisor and communicator.* Cities are also public communicators to their citizens and can motivate or at least advise them in climate-friendly behavior (e.g. when it comes to the retrofitting of buildings).

If actors and transactions can be perceived as the ‘hardware’ of a social system, institutions and governance structures form their ‘software’. *Institutions* did and do play a central role in the social sciences. The following statement by North reflects the prevailing understanding of institutions in economics and political science:

“Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. They are made up of formal constraints (e.g., rules, laws, and constitutions), informal constraints (e.g., norms of behavior, conventions, and self-imposed codes of conduct), and their enforcement characteristics. In consequence, they structure incentives in human exchange, whether political, social, or economic.” (North 1990: 3)

Similarly, Ostrom emphasizes that

“...an institution can be defined as the set of working rules that are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individuals dependent on their actions.” (Ostrom 1990: 51)

It is useful to distinguish formal from informal rules, and normative from constitutive rules. And it is worth noting that rules can have different levels of generality.

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<sup>9</sup> Roles are dependent on rules, which in turn are the core element of an institution.

There are two main ways in which institutions can constrain the actions of social agents—either through external control and sanctioning or through persuasion, voluntary appropriation or socialization. In our view, institutions have both a structural dimension, including formal and informal rules and systems and an ideational dimension, including normative and cognitive patterns. Institutions thus not only create the boundaries for individual cost-benefit analysis, they do also influence the individual's preferences and give them a normative meaning (Vatn 2009). We propose that the stability, robustness and self-reproducing character of institutions will be all the more pronounced that regulative pressures and systems of control combine with normative and cognitive frames and reinforce each other. Legal institutions, for example, would hardly be as effective if they were not strengthened by actors' internalized beliefs of what is 'right' and 'wrong', of what is 'honesty' and 'fraud', and so on. This ideational and motivational aspect of institutions is reflected in the role of cities as precursors, advisors and communicators of climate policies.

We have been stating that cities can take different roles in climate policy, and we indicated that role-taking is intrinsically linked to the rules that make up an institution. However, we should also hurry to note that while the rules of an institution provide a framework within which individuals or organizations act, they do not fully *determine* the actions of these actors. For mainly two reasons: First, constitutive and normative rules cannot cover every contingency that might arise in a given action situation. It is an intrinsic feature of action situations that they contain contingencies that cannot be fully anticipated by rules. Secondly, rules, norms and so on, themselves need to be interpreted and applied. Immanuel Kant (2000) has reminded us that every rule made up by human reason needs the faculty of judgment in order to decide whether a given instance (situation) is a case of the rule or not—a capability that itself cannot be brought under rules, or become institutionalized. And changing circumstances and unforeseeable problems make it desirable to vest individuals with discretionary powers to rethink and adjust old rules, norms, and ends, and sometimes elaborate new ones.<sup>10</sup> Inevitably, the individuals who occupy institutional roles do possess varying degrees of discretionary power in relation to their actions, as well as in view of institutions (Miller 2003, Winch 1958). This irreducible distinction between rules on the one hand and actors and situations on the other is a central entry-point for institutional innovation introduced by the side of the actor—and the evolution of action arenas. It is the sociologist Anthony Giddens who stresses this point, or in his terms 'the duality of structure': actors operate in structures, e.g. constrained by institutional rules, while at the same time they shape and transform rules (Giddens 1976).

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<sup>10</sup> Institutions can increase the *probability* of human actors to apply rules appropriately, e.g. by allocating more resources to educational processes and training. Nevertheless this increased probability does never translate into certainty, as the capability of deciding whether something is a case for the rule or not resides with the actor in a given situation.

*Governance structures* such as contracts, networks, bureaucracy, cooperation or markets are organizational solutions for making institutions effective, i.e. they are necessary for guaranteeing rights and duties and their use in coordinating transactions. Therefore, it is important to distinguish between institutions and organizations (Bromley 1989: 43). The latter are not themselves institutions; rather they reveal how institutions define concrete governance structures for shaping human (inter)actions at an individual or collective level. Property rights are a subset of formal or informal institutions. In our view, markets, hierarchies and networks (and hybrids of these) are the major types of governance structures. In the context of urban climate policy, we may think of different examples for all three types:

- *Markets* exist in various forms in cities, usually as a geographical subsection of national, if not global markets. If, for example, a city hosts a firm that is subject to the European Union Emissions Trading Scheme (EU ETS), (e.g. an energy provider), the behavior of this agent is constrained by the regulated market for emission permits. Market structures can also be used to tackle climate change on a local level, e.g. when individual emission permits are issued and traded (Fawcett and Parag 2010).<sup>11</sup>
- *Hierarchies* exist both in public authorities and in private organizations. Cities can use their hierarchical organization in order to ‘green’ their own purchasing and energy use behavior, or to influence other actors in the city. While climate change as an urban issue has very often entered local governments at a lower level of hierarchy (usually via environmental departments), it is obvious that hierarchical organizations perform better in urban climate policies if the respective top administrative levels are committed to it—or at least do not oppose it.
- *Networks* do play a crucial role in urban climate policies. First of all we can observe that cities themselves become members of climate policy networks. Second we can observe that NGO organizations dealing with climate change issues use their formal and informal networks to influence city governments and citizens. And thirdly we can sometimes see that business networks try to collectively improve their resource and energy efficiency, e.g. by pooling material flows or by sharing logistics.

These five core elements make up the institutional setting of any community, and their concrete outline and design decides about whether a given community performs

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<sup>11</sup> The idea of using Tradable Energy Quotas (TEQ) or Domestic Tradable Quotas (DTQ) as instruments to reduce emissions was first developed at Oxford University and debated in the UK. More recently, an Australian research project plans to try it out on Norfolk Island, located in the Pacific Ocean. Climate change and obesity are tackled with this market instrument at the same time (cf. [http://www.scu.edu.au/news/media.php?item\\_id=1641&action=show\\_item&type=M](http://www.scu.edu.au/news/media.php?item_id=1641&action=show_item&type=M)). Some scholars argue that per capita based TEQs/DTQs are both more ethically more adequate and environmentally more effective than quotas handed out to major firms (Bühns 2010).

sustainably or not: *Actors* need to be aware of environmental problems they have caused or contributed to (e.g. the unintended environmental consequences of intentional action, external effects), together with a willingness to take responsibility, and the capability to act effectively. *Transactions* need to be designed in such a way that environmental risks are minimized or avoided, or that unavoidable effects are harmless or do not overstretch the resiliency of the ecological system. This can be achieved by technological progress, by organizational and behavioral change, or by a combination of both. *Institutions* have to be designed in such a way that actions, transactions and their systemic interconnectedness over time does not encourage the negligence of the environmental implications of human activities, or even encourage unsustainable behavior or technologies. *Governance structures* have to fit in scale and mode in order to ensure an effective allocation of resources, burdens and returns. All these elements influence *action situations* in *action arenas*. Despite the fact that almost every human action involves the natural environment (e.g. by using natural resources and sinks), it may well be the case that situations and arenas do not (sustainably) take this fact into account. In other words: many action situations and arenas affect the quality of the natural environment, and all transactions deal with it to some degree, but it is not clear if and how situations and arenas do really reflect this point—e.g. due to non-sustainable institutional settings or myopic behavior of actors, or both. This is precisely why Institutions of Sustainability circumscribes a wide and complex area of theory and empirical research, and does not express an analytical truth (‘all institutions are by definition—e.g. due to their survival over time—sustainable’).

### 3. Local Climate Politics: Examples of an Institutionalization Process

We have already argued that local climate policy is a rather new area of collective action, despite the fact that cities have since their historical existence been caring for external effects of transactions in densely populated places. Local climate policy is an emerging action arena for urban actors, and institutional settings are equally in the making. In order to illustrate this thesis, and at the same time to characterize the institutionalization process a little more in detail, we would like to apply our IoS framework to four cases in point: Potsdam and Berlin in Germany, and New Delhi and Hyderabad in India. This choice in part is an arbitrary one, as we happen to do research in these places. But on the other hand we think that a very limited number of cases from very different geographical and institutional backgrounds can help to make things clearer, especially to test how helpful our analytical framework really is when it comes to contrasting cases.

Table 1: Four cases and their institutionalization of local climate policy<sup>12</sup>

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<sup>12</sup> The data are derived from various sources and from our own research in the ‘Sustainable Hyderabad’ project (<http://www.sustainable-hyderabad.de/>), funded by the German Ministry of Education and Research (BMBF). City data come from the respective statistical offices. The entries into the IoS framework dimensions are qualitative own assessments. Numbers refer to latest available data in the late

Case	Berlin (Germany)	Potsdam (Germany)	Delhi (India)	Hyderabad (India)
Dimension				
Inhabitants (millions)	3.46	0.155	16.75	6.1
GDP/cap (€ (% of national average))	25,600 (90.6%)	30,650 (108.5%)	1,218 (147%)	1,065 (129%)
Public expenditures/cap (€)	6,350	2,500	1,715	800
Public debt/cap (€)	17,900	600	-1,000 (surplus)	-100 (surplus)
Total CO <sub>2</sub> emissions <sup>-yr</sup> (million tons)	19.95	0.87	15.44	8.41
CO <sub>2</sub> emissions/cap <sup>-yr</sup> (t)	5.76	5.61	0.92	1.38
Major climate impacts	<ul style="list-style-type: none"> <li>- Summer heat waves, urban heat island effects</li> <li>- Less rain in summer</li> <li>- More rain in winter</li> </ul>	<ul style="list-style-type: none"> <li>- Summer heat waves, urban heat island effects</li> <li>- Less rain in summer</li> <li>- More rain in winter</li> </ul>	<ul style="list-style-type: none"> <li>- Heat waves, cold waves</li> <li>- Uncertain rainfall</li> <li>- Water scarcity</li> </ul>	<ul style="list-style-type: none"> <li>- Summer heat waves</li> <li>- Less / uncertain rainfall</li> <li>- More floods</li> <li>- More vector borne diseases</li> <li>- Food problems</li> </ul>
Actors	<ul style="list-style-type: none"> <li>- City administration</li> <li>- National government</li> <li>- Local civil society</li> <li>- Green Economy</li> <li>- Science</li> </ul>	<ul style="list-style-type: none"> <li>- City administration</li> <li>- National government</li> <li>- Local civil society</li> <li>- Science</li> </ul>	<ul style="list-style-type: none"> <li>- City administration</li> <li>- National government</li> <li>- International communities</li> <li>- Science</li> <li>- Local civil society</li> </ul>	<ul style="list-style-type: none"> <li>- National &amp; state governments</li> <li>- Science</li> <li>- City administration</li> <li>- Local civil society</li> </ul>
Transactions	<ul style="list-style-type: none"> <li>- Energy efficiency</li> <li>- Renewable energy</li> <li>- Lifestyle changes</li> </ul>	<ul style="list-style-type: none"> <li>- Renewable energy</li> <li>- Energy efficiency</li> <li>- Lifestyle changes</li> </ul>	<ul style="list-style-type: none"> <li>- Energy security</li> <li>- Renewable energy</li> <li>- Energy efficiency</li> <li>- Lifestyle changes</li> </ul>	<ul style="list-style-type: none"> <li>- Energy security</li> <li>- Energy efficiency</li> <li>- Renewable energy</li> </ul>
Governance structure	<ul style="list-style-type: none"> <li>- Federal system</li> <li>- Strong local autonomy</li> <li>- Hierarchy, market, networks</li> </ul>	<ul style="list-style-type: none"> <li>- Federal system</li> <li>- Medium local autonomy</li> <li>- Hierarchy, networks, market</li> </ul>	<ul style="list-style-type: none"> <li>- Federal System</li> <li>- Medium local autonomy</li> <li>- Hierarchy, networks, market</li> </ul>	<ul style="list-style-type: none"> <li>- Federal system</li> <li>- Weak local autonomy</li> <li>- Hierarchy, market, networks</li> </ul>
Action situations	<ul style="list-style-type: none"> <li>- Maintaining prosperity</li> </ul>	<ul style="list-style-type: none"> <li>- Maintaining prosperity</li> </ul>	<ul style="list-style-type: none"> <li>- Ensuring growth</li> <li>- Growing middle</li> </ul>	<ul style="list-style-type: none"> <li>- Ensuring growth</li> <li>- Growing middle</li> </ul>

2000's, leading to a slight fuzziness. Nevertheless the numbers provided offer a good estimate for the basic differences and trends we are mainly interested in.

	<ul style="list-style-type: none"> <li>- Being a responsible capital</li> <li>- Balancing lifestyle &amp; environment</li> </ul>	<ul style="list-style-type: none"> <li>- Managing population growth</li> <li>- Balancing lifestyle &amp; environment</li> </ul>	<ul style="list-style-type: none"> <li>class consumption</li> <li>- Struggling with poverty</li> <li>- Being a responsible capital</li> </ul>	<ul style="list-style-type: none"> <li>class consumption</li> <li>- Struggling with poverty</li> <li>- Dealing with political crisis</li> </ul>
Action arenas	<ul style="list-style-type: none"> <li>- Local energy &amp; climate policy</li> <li>- Urban &amp; traffic planning</li> <li>- Establishing climate change adaptation</li> </ul>	<ul style="list-style-type: none"> <li>- Local energy &amp; climate policy</li> <li>- Urban &amp; traffic planning</li> </ul>	<ul style="list-style-type: none"> <li>- Urban &amp; traffic planning</li> <li>- Poverty reduction</li> <li>- Clean &amp; Green City</li> <li>- Establishing urban climate policy</li> <li>- Establishing climate change adaptation</li> </ul>	<ul style="list-style-type: none"> <li>- Urban &amp; traffic planning</li> <li>- Poverty reduction</li> <li>- Establishing climate change adaptation</li> </ul>
(Degree of implementation)	strong	strong-to-medium	medium	weak

It is a common problem for urban research of any kind that the definitions of a city vary from country to country, and that the political boundaries of municipalities do not always cover the real urban agglomeration. The cases of Berlin, the capital of Germany, and of adjacent Potsdam, the capital of the federal state of Brandenburg, are rather easy: no urban agglomeration beyond their boundaries exist. Things are more complicated in Delhi, which refers to the National Capital Territory (NCT) of Delhi, which includes New Delhi, the capital of India. The same holds for Hyderabad, the capital of the federal state of Andhra Pradesh, where we refer to the Greater Hyderabad Municipal Corporation (GHMC).

Delhi is the biggest city (urban agglomeration) in our small sample—home of more than 16 million inhabitants according to the 2011 Indian census. Hyderabad ranges second, with more than 6 million, followed by Berlin, the biggest German city with almost 3.5 million. Potsdam, Brandenburg’s major urban area, is the smallest city in our sample—home to 155,000 people. While Berlin’s population remains by and large stable, Potsdam is growing slightly, while both Delhi and Hyderabad grow significantly, mostly due to urban-to-rural migration.

The average per capita income (Gross Domestic Product in Germany, Gross State Domestic Product in India) in our cities reflects the different levels of economic

development in both countries.<sup>13</sup> All cities—except Berlin—show higher per capita incomes than their national averages.

The public expenditures per capita of the city's administrations vary substantially, with Berlin spending more than 6,000 Euro per person on the one end, and Hyderabad spending 800 on the other. Of course the structure of public urban expenditures differs between Indian and German cities. In both cases, expenditures for welfare state goals are important: in India it is about policies to support the living conditions (housing, food supply) of the poor, in Germany it is mainly about supporting the unemployed. Indian cities invest higher shares of their budget into new public infrastructure, mainly roads, bridges etc., while German municipalities had to reduce this share over time. Public debt per capita in Berlin is highest, in Potsdam lowest; Hyderabad and Delhi both have a net surplus.

In total terms, the city of Berlin, although only No. 3 in population terms in our sample, has the highest CO<sub>2</sub> emissions: almost 20 million tons per year. Over time, however, Berlin managed to reduce its GHG emissions—despite economic growth and a stable population. With more than 15 million tons Delhi's emissions rank second, but they grow significantly due to remarkable economic and population growth.<sup>14</sup> Hyderabad's more than 8 million tons do also count more than Potsdam's about 0.8 million tons. In per capita terms, the two German cities clearly top the two Indian cities, reflecting the general pattern that per capita consumption and emission levels in developed countries are much higher than in developing ones.<sup>15</sup>

With respect to climate impacts and vulnerability it can be generally stated that India is—due to its size and geographical structure—one of the countries most exposed to climate change and climate change driven climate variability. This fact is aggravated by the very high vulnerability of the Indian economy and society to adverse climate impacts, namely its high share of poor people, its high dependency on agriculture (which again depends heavily upon the monsoon), and an often poor, and mostly not well adapted infrastructure (INCCA 2010, O'Brien 2004). Given their different locations, Delhi and

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<sup>13</sup> We have chosen current market prices and exchange rates, and not PPP dollars. Income differences would look slightly less dramatic had we chosen PPP dollars, taking national price differences into account.

<sup>14</sup> We should note that carbon accounting for cities is a difficult task, mainly due to the distinction between production based and consumption based approaches (Kennedy and Sgouridis 2011). While Berlin uses a consumption based approach (emissions elsewhere for electricity in Berlin are counted in), Delhi uses a production based approach (only emissions within the city boundaries count). None of the four cities includes personal consumption related emissions.

<sup>15</sup> Given the enduring growth rate of the Indian economy—less than 8 percent annual growth are perceived as critical—compared to the only moderate growth in Germany, this gap is narrowing. In the 2030s, India's cumulative emissions will be higher than those of Japan, and by the 2080s they will outpace Western Europe as a whole (Botzen et al. 2008). If unmitigated, India's urban GHG emissions could increase up to 1.6 billion tons of CO<sub>2eq</sub>, a significant increase from its 2005 figure of 230 million tons (MGI 2010: 208).

Hyderabad face slightly different climate change impacts. Cold spells, which might occur in Delhi, are no problem for the southern city of Hyderabad. Here, heat waves, water scarcity, combined with flash floods, more vector borne diseases, and a more critical food provisioning are more probable. In addition, large parts of the general public and the administration are not aware of the risks that climate change might pose to them

Germany in general seems less affected by climate change, and due to its development stage, infrastructure and organizational features a better preparedness and a lower relative vulnerability can be assumed (Zebisch et al. 2005). However, even German cities will face problems once the temperatures will rise, and it is especially the urban heat island effect that increases the risk of mortality. In addition, both Berlin and Potsdam (both belonging to the same geographical area and climatic zone) are confronted with less water in summer.

The institutional setting in Indian cities as compared to German ones is at least as diverse as their respective climatic conditions. Reaching political autonomy much later than Germany, India's economic, social and political history is full of external interventions, all of them deeply shaping its institutional design. This holds especially for the long era of British colonialism (Habib 2010). While German cities can look back to a long history of political autonomy and are part of a strong federal system, India's cities are less autonomous, more dependent on decisions and resource allocations from the central and state governments, and have less political representation in India's political system.

The action arena of urban climate policy is a relative new one in both countries, but in Germany it has evolved during the last about 20 years, whereas Indian cities constitute it right now. This is reflected by the fact that both Berlin and Potsdam have anchored this area in their organizational structure (e.g. by assigning branches, staff, competences, and resources to it), while both Hyderabad and Delhi still lack this stage of institutionalization. German cities are encouraged to do so by the wider institutional setting: being a signatory to the Kyoto Protocol with emission reduction duties, and having implemented climate policy at the national level in various ministries and programs, both the international and the national boundary conditions for German cities favor the establishment of climate policies. It should be noted that even in Germany climate protection is a voluntary, not a mandatory action arena for municipalities (other than infrastructure provisioning or social security). And it should also be noted that the financial situation of German municipalities has become worse during the last years, which is reflected in the high to very high public debt that Potsdam and Berlin have to deal with. This imposes severe restrictions to costly measures in the voluntary field of urban climate policy in both cities. However, both cities have ambitious plans to reduce their GHG emissions by 2050, do have policies and programs in place to achieve them, and are in a publicly visible debate with science, the civil society, and the business sector about the right way to go. As city growth is mainly history for both Berlin and, to a lesser degree Potsdam, both cities find it difficult to realize more energy efficiency in buildings or new waves of renewable energy systems. A major task instead is to renew and improve



the performance of the existing stock of buildings and vehicles—sometimes a quite costly exercise, which in the case of buildings raises social dilemma.

A main actor in the action arena of urban climate policy in Berlin and Potsdam is the public administration. But while in other cities the top of this administration—the Lord Mayor of a city—has taken on responsibility and acts as a publicly visible leading figure (such as Boris Palmer (Green Party), the Lord Mayor of Tübingen), this is not the case in our two German cities. Both Lord Mayors do not obstruct, yet rather support their cities' climate policy, the real initiative comes from the departments for environment (more so in Berlin) and urban planning (more so in Potsdam). Climate policy has become the most relevant area of environmental policy in Germany at the national level, and it is on its way to gain ground at the municipal level, where problems of air pollution, noise or land use (e.g. land recycling) are still more prominent. Germany has a strong environmental movement, and the local branches of national environmental NGOs are also active in their communities. In Potsdam, the Energy Forum Potsdam, a union of engaged individuals and organizations is very active, with personal and institutional links to the city administration, while in Berlin, on top of its vivid civil society, a critical mass of green businesses push forward for economic reasons.

Delhi and Hyderabad are both economically very important cities for India. Delhi, a metropolitan region with a broad array of functions, is also the major traffic hub of the North, and of course home of the central government. As with Berlin, this role as the national capital does not only create some intensive links with the national policy level, but also brings about a sense of national responsibility, promoting a stance of being a publicly visible role model. Hyderabad, the capital of Andhra Pradesh, is also home to a broad range of industries (e.g. pharmaceutical), and more recently has emerged as a second national IT-hub next to Bangalore. Since 2007, the agenda of many political actors in Hyderabad is occupied by the debate about splitting the state of Andhra Pradesh, and forming a new independent state most probably named Telangana.

There is no established action arena of urban climate policy in Hyderabad. While one could be tempted to understand this in the case of GHG mitigation, given the low per capita emissions and the relatively high incidence of poverty, this is not so easy to understand when it comes to adaptation to climate change, as the city is already now suffering from weather extremes, such as heat, drought, and periodic heavy rainfalls, affecting especially the poor, but also the whole urban traffic system. Our analysis of the mass media discourse on climate change in Hyderabad has revealed that especially the local language newspapers report quite a lot on weather extremes, but—other than the English speaking national newspapers in India—usually do not link them to global warming. In other words: the public discourse in Hyderabad systematically underestimates the risks that climate change poses to the city and its inhabitants, and thus

exacerbates successful adaptation. The professional discourse, however, is better informed, and has started recently to influence the urban administration.<sup>16</sup>

While Hyderabad still lacks the formation of a climate policy action arena, Delhi has established it recently. In 2009, Shri Rakesh Mehta, Chief Secretary Government of National Capital Territory of Delhi, has written a monograph titled 'Climate Change Agenda for Delhi 2009-2012', in which he lists all the urban policy activities that contribute to a reduction of GHG emissions, from transportation to waste management. A close analysis of the document (Mehta 2009) reveals that no quantitative emission reduction target has been given, and that all measures proposed have been undertaken independent of a climate policy goal. This might be inevitable when a new action arena is established. It is interesting to note that Delhi's agenda explicitly refers to the restart of India's national climate policy, documented in the 'National Action Plan on Climate Change' (NAPCC), launched by the Indian Prime Minister in 2008. Six out of eight 'national missions', outlined by the NAPCC, are taken up by the Delhi action plan, among them the Sustainable Habitat Mission. This is a clear example of cross-level interaction, and may be even of polycentric systems that cope with global problems (Ostrom 2010).

The Delhi government is currently working towards making Delhi a carbon neutral city in the next 20 years. Having become the first city in the country to have a climate change agenda, the environment department is now planning to go one step ahead and formulate phase-II of its green plan that should be ready in another year. The department has also commissioned a study for a quantitative assessment of its missions under the climate action plan 2009-2012. A detailed and geographically explicit carbon foot printing of the city ('carbon map') is under way and the report will be completed by the end of 2011.

While the urban administration does play a very active role in the action arena of urban climate policy in the Indian capital region, one must not underestimate the role of science. Only two examples from Delhi shall illustrate this point.

The internationally well recognized Energy and Resource Institute (TERI) is operating all over India, with New Delhi as its home base. It investigates sustainable and viable energy technologies and energy and use in both rural and urban India, and plays a major role in India's scientific discourse on climate change.<sup>17</sup> But there are also more locally oriented nodes of knowledge dissemination. For example, the Delhi-based Mahatma Gandhi Institute for Combating Climate Change (MGICCC)—formerly known

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<sup>16</sup> The Hyderabad-based Center for Climate Change (hosted by the Engineering Staff College of India) is very active in raising professional awareness among mass media representatives, the business sector, and the public administration. Our own research project has been given the opportunity to feed information about Hyderabad's vulnerability into the planning process of the Hyderabad Metropolitan Development Authority (HMDA).

<sup>17</sup> TERI director Rajendra Pachauri is chairman of the Intergovernmental Panel on Climate Change (IPCC).

as Mahatma Gandhi Institute of Integrated Rural Energy Planning & Development (MGIIREPD)—has been established with a view to promote renewable energy, to combat climate change, and to become an active center of excellence for the whole urban region.

The overall degree of implementation of the action arena urban climate policy in Hyderabad is weak, as compared to the other three cases. In our sample, Berlin has the highest degree of implementation, followed by Potsdam and Delhi. While Potsdam might be ahead in purely institutional terms (e.g. having a climate protection concept adopted by the city council), we recognize Delhi's fresh attempt as well as the ambition of its climate policy goals. Given the mere size of the agglomeration, and the severity of urban development problems Delhi is facing the activities in the city are remarkable, even in the absence of a city council commitment so far. Hyderabad stands at the very beginning of implementation.

By now, we have only presented an analytic tool and applied it to four case study regions. And by now we have treated urban climate policy only as an emerging action arena. But we have not analyzed the reasons and causes for this formation. As indicated above, there is a dialectical relation between actors and structures, including institutions and forms of government. This is why the right arrow in Fig. 1 reads as 'institutional performance', while the left arrow highlights 'institutional innovation'. Institutional innovation, we indicated it also, is to some degree built-in in the system, as actors can only perform rules by interpreting them and applying them in concrete action situations. In addition, transactions, i.e. actor-resource interactions, are a further source of innovation, first of all because natural systems can never be fully predicted or controlled, leaving constantly room for unexpected outcomes. Secondly, transactions can create sub-optimal or even disastrous outcomes, both with respect to the environmental quality of the system involved and to the social distribution of benefits. Ecological crises bear the potential for social learning, i.e. for a productive irritation of social actors, and this in turn can stimulate institutional reform. In the next section, we would like to examine the emerging field of urban climate politics as a result of a social learning process, and as an area of institutional innovation. Once again, we will come back to our four example cities in order to illustrate this endeavor.

#### **4. Changing Rules by Discourse**

Every game depends on the fact that rules are set and not subject to dispute time and again. This also implies that a *change* of rules is internally oriented towards a final (as history shows: rather intermediate) situation of rule fixation, or towards a situation in which actors can perform transactions in their everyday situations without feeling the need to reflect upon or change these rules.<sup>18</sup> But if everyday actions and transactions do constantly lead to critical outcomes, the need for institutional change arises. We would

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<sup>18</sup> There is a clear link between the systemic role of institutions and the psychological role of habits.

like to term the social space in which this need is felt, formulated and suggestions are debated 'discourse'.

One of the interesting results from the experimental literature on transactions and commons is that a little 'cheap talk' can substantially increase the amount of cooperation in a commons dilemma laboratory experiment. Effective communication among resource users is a well-verified design principle for institutions to manage the commons (Ostrom 1990). Talk, it is suggested, builds trust and helps individuals anticipate the strategies of others, including punishment for non-cooperation (Ostrom 2000). It helps define how others will act and thus helps individuals define the context in which they are operating and the roles that are appropriate.

A major line of social theory centered around Habermas (1984) argues that deliberation is fundamental to human rationality. While not couched in the same language as that emerging from laboratory studies, the point is much the same. Serious talk, deliberation, is fundamental to human decision making. The thin rational actor model suggests that individuals make decisions quickly and in isolation by performing a benefit/cost/risk calculation. But empirical human beings rarely are able (or willing) to follow that model of isolated calculation in order to come to a decision.

"In contrast to our calculative abilities, we have very substantial skills at language processing and pattern recognition. (...) If we are so weak with regard to calculation and so strong with regard to language, our evolved rationality may be one of deliberation rather than calculation." (Dietz 2005: 217)

Following Dietz (2005), we would like to contrast between a thin and a thick interpretation of 'talk' in human decision making. The thin version would suggest that talk serves primarily to gather information and make deals. Individuals assess each other's propensity to behave altruistically and/or to punish defection. They also make commitments about such behaviors. The talk involves both the surface commitment and an assessment of how trustworthy those commitments are. The thicker version of talk suggests that while these instrumental processes go on, talk also entails something deeper. It defines the situation and thus invokes how one is expected to behave and thus the norms and rules that are appropriate to use. Talk also may entail emotions that heighten the commitments people make. The core argument of Habermas is that in the long run, deliberation changes individual values. Thus, deliberation may be the engine by which cultural change occur, perhaps a sort of meiotic drive.

Following Habermas, we do not subscribe to the usual distinction between 'cheap talk' and 'real action', because real (effective, organized, sustained) action as a social phenomenon is internally linked to the communicative functions of language, namely (i) to attach meaning to bodily movements, (ii) to enable a common and shared understanding of the world, and to (iii) enable a social consensus on contested matters, i.e. to resolve conflicts in a way that the rights of others as reasonable human beings is recognized.

It is in discourses that actors reflect upon and collectively re-design given, but somehow inappropriate institutions. Systemic failure of transactions, such as repeated and cumulative environmental degradation resulting from existing institutional regulations of human-nature interactions, can result in reduced benefits for some participants of a setting, or even increased costs for others, including outsiders of a given institutional setting. But other than mainstream economists think, a negative change in the payout matrix of rational (which usually means: utility maximizing) actors does not *automatically* lead to a need for institutional change. It might be a necessary, but it is not a sufficient cause for social action. Social actors are rational beings in a much wider sense, so that reduced benefits or accrued costs need to be interpreted as outcomes that violate the norm of fair treatment. If malfunctions of institutionalized transactions not only violate agreed-upon procedures, but also can be perceived as unfair outcomes, violating a shared norm, the motivation for institutional change is much stronger. It is in simple calculations that actors do realize their reduced utilities, but it is in discourses that they develop a shared understanding of the relevance and the normative meaning of that loss. Discourses are in one the medium in which a collective understanding of a crisis of transactions can be developed, and in which new institutional arrangements can be found. Discourses are the medium of institutional change and innovation.<sup>19</sup>

Coming back to the issue of urban climate policy, we have already stressed that this is a newly emerging action arena. And it is an embedded one. The ultimate frame of reference for urban climate actions we would like to term ‘Climate Change Discourse’ (Reusswig 2010, Reusswig and Lass 2010). A *Climate Change Discourse* (CCD) is a thematically focused and (more or less) coupled sequence of publicly visible arguments related to climate change issues (existence, causes, consequences, adaptation, and mitigation) in various contexts (or framings) that different social actors are engaged in, in order to influence (1) one another, (2) specific boundary conditions of social action, (3) the general public so, that the control/power basis, interests and worldviews of the speaking actors have a higher chance to prevail in the social interpretation and individual or collective decision making processes.

Social actors engage in discourses because—and to the degree—that their own interests cannot be pursued or legitimized otherwise. Discourses thus reflect the interactive and communicative character of social action, and thus discourses are entangled realities, combining factual and normative elements. It is important to note that—despite power and interest are crucial in discourse analysis—both are internally related to social norms and world views, i.e. systems of ethically and cognitively meaningful interpretations of the social and natural world.

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<sup>19</sup> We indicated above that the ‘seeds’ of institutional change are built-in in institutional settings, as following a rule in the social world (other than in the natural world) does always require the interpretation and application of the rule by an actor. We can now say that it is in discourses that this potential source of innovation may become actualized.

This is particularly important with respect to the CCD. Being a rather new social issue—as compared to, say, the discourse about market-state relations in liberalism or socialism—the implications of both mitigation and adaptation to climate change bear the potential for major economic and social disruptions and are thus politically relevant, if not ‘dangerous’. If, for example, anthropogenic climate change is caused by the burning of fossil fuels, and if one was decided to limit global warming to, say, less than 2° C, one major consequence would be to use energy more efficiently and to substitute renewable for fossil energy sources. If one would be a major owner of fossil fuel resources (or of technologies that use these resources, such as a manufacturer of internal combustion engines or an owner of thermal power plants), a CCD that favors energy efficiency and, especially, a shift to renewable energy would erode my economic asset base and thus run counter my interests. The ‘natural’ move in such a discourse for me to take would thus be to argue against that position, either by contesting the scientific basis of climate change, or by finding arguments against an energy shift (e.g. by highlighting the prohibitively high costs of substitution). The important point is that my resource base—oil fields or coal fired power plants—does ‘recommend’, but not ‘necessitate’ such as discourse strategy. It would be an equally feasible strategy to scan the CCD for new options of my asset structure, e.g. by investing a limited amount of capital into renewable energy sources. The leading question for my participation in the CCD would then not be ‘How can I debunk the existing CCD?’ but rather ‘How can I utilize the existing CCD in order to survive as a firm with a modified asset base?’ That is to say: interests are (heavily) influenced by a given resource endowment (e.g. economic assets), but they are not dictated by it. Instead, new information about the real world is used as a stimulus for new interpretations of the (future) option space: Are there new business opportunities, what would happen if we changed our investment portfolio, can a ‘new energy world’ be conceived in which our business does play a major role, and how should it look like if this was to happen? New world views can thus change the interpretation of my own resource base, and thus lead to interest shifts. Interests, this is the message, are not ‘mute’ objects—or simple consequences of the resource endowment of an individual or organization under only one description. Instead, they are interpreted assets. Changes in world views thus do bear the chance to change interests. This is why public discourses not only are public add-ons to pre-defined interests, but can intervene in the very definition (i.e. interpretation) of my ‘private’ interests.

This CCD also frames the arena of urban climate policy. The emergence of a climate change discourse in the last 40 or so years is not only a result from scientific research—as important as it might be—, it is also a symptom of the social awareness of a socio-ecological crisis (Becker and Jahn 1999). But does it have the potential to change some of the structures and rules in place in cities? Can it move actor to re-interpret their asset base in a way that mobilizes action or even capital in new, more sustainable directions?

We have seen above (section 3) that our four example cities are rather heterogeneous when it comes to the implementation of the new action arena urban

climate policy—not only due to country or development stage characteristics. It seems that in Berlin, Potsdam and Delhi climate change has become an action arena on its own right, with actors, transactions, institutional settings, and governance structures. They differ, as economic and political conditions differ, but they show similar features. Hyderabad might be perceived as a late comer in this respect, despite some promising developments.

But there is another way of interpreting the future path of a city like Hyderabad. Shukla et al. (2008) have shown in a model based scenario comparison for all India that a sustainability policy package is able to reduce GHG emissions until 2050 in a comparable magnitude as a pure climate policy package would do.<sup>20</sup> While the climate policy package comprises a very limited set of very targeted policies (carbon taxes, carbon capture and storage), the sustainability package is much broader in measures, policy areas and transactions involved. It comprises elements like improving water efficiency, substituting cement for wood in the construction sector, more walking and public transport in cities, shared management of strategic resources with India's neighboring countries, and so on. This also means that the co-benefits from these policy measures are much wider distributed across society, such as improving the quality of (urban) life, or strengthening local economic activities. This would, on the one hand, increase the probability of public support due to a greater number of potential beneficiaries. But on the other hand it would be much more ambitious in terms of institutional complexity, as many more departments, policies, funding agencies etc. would be involved. However, given the situation in cities like Hyderabad, we see a realistic chance to put all factual elements of urban climate policy on the table of urban decision making without overstressing the local institutions and action arenas. Already existing arenas and related programs could be utilized and slightly re-oriented in order to promote the idea of cutting the growth of GHG emissions from Indian megacities. According to existing masterplans, Hyderabad wants to become a 'Sustainable City'—although climate and climate change are not mentioned there. By combining the forces of science, civil society actors, the small but existing green business sector and the willing parts of the administration it should be possible to change the rules of play in the city—may be by pilot projects that may later diffuse across the city.<sup>21</sup>

Highlighting the co-benefits of urban climate policies does not necessarily imply a complete re-framing of this emerging action arena. Lin Ostrom (2010) has emphasized the essential role of co-benefits of carbon policies, and some scholars even assume that it is these co-benefits—and less the interest in protecting a rather distant global commons—

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<sup>20</sup> In both scenarios, India's total emissions would continue to grow until about 2030, and then fall until 2050 to the 2000 level. Given the ongoing population and economic growth in India, this 2050-stabilization would translate into much higher carbon efficiency and much lower per capita carbon footprints.

<sup>21</sup> In the 'Sustainable Hyderabad' project we are currently starting a number of these small scale pilot projects.

would also drive the actors in this arena (Engel and Orbach 2008).<sup>22</sup> Co-benefits can and usually do emerge when a new action arena is established and new rules created. And they have to be used even if cities have managed to create an urban climate policy arena. Delhi is right now doing so, but its first major step—the Delhi Climate Change Agenda—is little more than a compilation of existing policies and programs, lacking an emission target and independent funding. As these programs can be evaluated as beneficial in the sense of protecting and improving the urban environment as a common good, one can even argue that the ‘co-benefits’ of climate policy preceded in time and, at least for some actors, also in relevance the proper benefits of climate policy. In Berlin, where the institutionalization process is further developed, the public debt situation seriously limits the action capacity of the city’s administration. This is a major reason why Berlin tries heavily to improve energy efficiency and to promote renewable energy by negotiation and cooperation with the business sector. Another strategy is to identify climate co-benefits of other policies, and to reinforce them. For example, while it would be difficult if not impossible to fund new paths for bicycles from the city’s climate policy budget, it would be possible to fund them from budgets that are dedicated to adapt the public infrastructure to the demographic change European cities are facing: barrier-free paths for the elderly can also be used by bicyclists and pedestrians.

Krause (2011) has shown for U.S. cities that the degree of implementation of urban climate policy measures increases with the existence and stringency of overarching strategic climate policy concepts, transcending individual measures and/or good service provisioning by a city.<sup>23</sup> If we may transfer these findings to our cases, Berlin, Potsdam and Delhi have good chances to meet their own climate targets, while Hyderabad would first have to set one. Cities start to create the new action arena of urban climate policy for various reasons (Sippel and Jensen 2009): economic (energy cost savings, revenue increases, smart growth), quality of life (air quality, traffic congestion reduction, public health, social integration), or political (trickle down from national levels, internal pressure, reputation and trend-setting). The specific combination of these motives distinguishes cities.

It is true for all four cities that we have been looking at: an efficient urban climate policy cannot be brought about without an active involvement of the business sector and the citizens themselves. Be it at the national or local level: climate policy cannot be realized without the active participation of citizens. For various reasons:

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<sup>22</sup> Engel and Orbach (2008) try to interpret urban climate policies by U.S. cities as compatible with the standard tool of utility maximizing actors, such as ‘warm glow’ or the underestimation of costs. Vatn (2008) convincingly argues that these theory-strategic arguments have clear flaws.

<sup>23</sup> Finn and McCormick (2011) remind us that a coherent and stringent climate policy might not be sufficient, and calls for a holistic approach that encompasses issues such as fair economic development and social equity. As we have seen, these points are a *conditio sine qua non* for the two Indian cities in our sample.



- While climate change is heavily dependent upon scientific analysis, it is—as a social, not as a ‘natural’ fact—clearly dependent upon public perception and concern, as well as on agenda setting by the political system. It was the public climate discourse—including perception and action—that did put scientific findings on the agenda of policy makers and corporate actors. Climate policy needs the person.
- Political decisions have to be backed by the public, especially in democracies, where politicians hope for (re-)election by the electorate. We know from many surveys that climate change is a concern for many, and that large parts of the public ask for more pro-active climate policies. Climate policy needs the citizen.
- Given the high share of consumption related emissions (more than 40% of the personal carbon footprint), individuals (private households) do have a clear responsibility to contribute to climate protection. Climate policy needs the consumer.

While in all our four cases we find an active civil society pushing for more climate protection, together with relatively small groups of people living a low-carbon lifestyle already, the majority of citizens is not very ‘green’ in their lifestyles. Nevertheless both pioneer groups—the green business sector as well as the green lifestyle ‘vanguard’—are important when it comes to a social change to low emission cities. Social change has never come about by masses switching from one set of rules to another one within a short span of time. Even major social changes come about slowly, and marginal groups do often play a pivotal role. This is why experiments in cities (e.g. in some schools or quarters) are that important. They can become the catalysts of much wider changes.

Community-based action has the potential to both change the attitudes and behavior of participating actors and of government policies (Middlemiss 2011). This is actually the case in Berlin and, to a lesser degree, also in Potsdam. Indian environmental NGOs propagate individual climate action in order to reduce the personal carbon footprint, but also to stimulate government action (cf. NO<sub>2</sub>CO<sub>2</sub>, an Indian initiative based in Bangalore: <http://www.no2co2.in/>). The rich Indian civil society is a good breeding ground for a climate policy action. However, even a strong civil society is no substitute for good government. In absence of it, civil society organizations can also try to bypass transparent and democratic procedures, thus further contributing to a situation of bad governance instead of setting an end to it (Bardhan 2011). Strong governance signals and leadership are still essential for fostering a positive public response to the challenges of climate change (Hobson and Niemeyer 2011).

So there is no way around institutional change in order to make urban climate policy happen. In this paper we tried to propose a theoretical framework for analyzing the underlying process of shaping a new action arena, including actors, transactions, institutions, and governance rules. We have emphasized the innovative role of actors, and the constitutive role of a public discourse for reflection and deliberation. New rules are

crafted by discourses. It is worth to remember a founding father of sociology in this context:

“Not ideas, but material and ideal interests, directly govern men’s conduct. Yet very frequently the ‘world images’ that have been created by ‘ideas’ have, like switchmen, determined the tracks along which action has been pushed by the dynamic of interest. ‘From what’ and ‘for what’ one wished to be redeemed and, let us not forget, ‘could be’ redeemed, depended upon one’s image of the world.” (Weber 1946: 280)

Redemption from the carbon lock-in path of urban development has to be found by the crafting of new rules by new discourses. While many observers think that rapidly growing India will inevitably enter this path that cities like Berlin and Potsdam now try to overcome, the fact that 70-80 percent of India’s infrastructure in 2030 are still to be built is encouraging. 800 billion € will have to be invested in the Indian urban infrastructure (MGI 2010) until then, a real challenge. The individual investment requirements for Delhi and Hyderabad are 95 billion € and 29 billion € respectively (MGI 2011: 20). These funds have to be invested in any case—whether the cities care for the climate or not. If parts of that investment could be invested in a sustainable, climate-friendly way, they would not only contribute to emissions reduction, but also to ‘green growth’ (Jaeger et al. 2011).

How could this greening of investment come about? It is no surprise that we hold institutional change to be a key for this climate-friendly re-orientation of urban investment decisions in India. A government report on urban infrastructure and service provisioning in India comes to the conclusion that

“the challenge of managing urbanization will have to be addressed through a combination of increased investment, strengthening the framework for governance and financing, and a comprehensive capacity building program at all levels of government [...] At the centre of this approach is the role of cities and towns in an interdependent federal system. The Committee is of the view that India’s [...] urban local bodies (ULBs) need to be strengthened as local self-government with clear functions, independent financial resources, and autonomy to take decisions on investment and service delivery. They must also be made accountable to citizens.” (HPEC 2011: XXI)

Today, Indian cities contribute about 60 percent to India’s GDP, by 2030 their share will have risen to 70 percent (MGI 2010: 17). If India’s cities should shift from simple growth engines to promoters of sustainable development, they need institutional reforms. The creation of a new action arena on urban climate policy (either under this term or under the term sustainability) can become a catalyst for that change. Given the pressing problems of urban congestion, time loss, and environmental degradation due to rapidly increasing individualized motor transport the traffic domain would be a good starting point (Pucher et al. 2005).

There is no ‘silver bullet’ when it comes to preventing dangerous climate change. A multitude of measures will have to be taken, at all levels of human decision making. It is not the case that only humankind as a global actor on a global level can provide a solution for a global problem. Multi-level and polycentric approaches are needed (Ostrom 2010), and they also need some degree of nesting and coherence. The local level is needed, and it can even set the pace for the international level—many cities have more

ambitious GHG emission reduction targets than their respective nations. However, one might also think of more integration of these local activities, as well as of more systematic links between the local and the global levels of climate policy.

Given the slow pace of UNFCCC negotiations, where all matters come under one treaty, and the consensus principle allows the slowest actor to determine the process, more flexible mechanisms of *horizontal coordination* between cities are needed. Regional networks such as the Climate Alliance or ICLEI could become the institutional nuclei for such coordination. With respect to the *vertical coordination* one might envision to link city activities to UNFCCC mechanisms, such as emission trading schemes between citizens, or a Clean Development Mechanism between cities, facilitating the transfer of clean technologies and green lifestyles.

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