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Navigating Troubled Waters

An analysis of how urban water regimes in the global South reproduce inequality

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Abstract

This research is an attempt to conceptualize the underlying forces behind persistent and ubiquitous problems of inequality in access to water in cities of the global south. Inequality in water access is hypothesized to result from urban water regimes that tend to prioritize the right to water access or to provide preferential terms of access for some groups in society, while marginalizing others.

By employing a critical realist approach, different theories in relation to inequality are applied in exploring the mechanisms and conditions leading to the unequal provision of water. In doing so, a structuralist perspective is built on the transition framework, integrated with critical urban theory and tested in two settings, Johannesburg, South Africa, and Hyderabad, India. In addition, a relational perspective, based on the concept of durable inequality, is used to scrutinize the relationship between state and citizen in contemporary South Africa and India.

Combining these perspectives tells us that the emergence of urban water regimes and inequality in access to water are associated with a set of different mechanisms, such as world city formations, and the World Bank's strategic governance move, in promoting corporate models for municipalities and water utilities. They are also attributed to specific geo-historical conditions, within and through which different forms of inequality have been constructed around bounded categories (e.g. race, caste, class) especially through the politics of privilege and the politics of resistance in these cities. In Johannesburg, the dominance of the ANC and its use of increasingly technocratic modes of government have hindered many forms of political participation. In Hyderabad, there is less meaningful interaction between the state and the citizens as compared with Johannesburg, in so far as the mode of intermediation is often through party-based patronage.

By asking the question "what can be done?" the present research draws on collective agency and contentious politics, and strives to bring these concepts into the transition thinking, in order to contest the unsustainable characteristics of urban water regimes and ultimately inequality in access to water in urban areas.

Key words: Water Access, Inequality, Transition Framework, Urban Water Regimes, World City, Contentious Politics, Hyderabad, India, Johannesburg, South Africa

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To Mehdi,
In Memory of Ali

Table of Contents

Figures and Tables

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Acronyms

ADB, Asian Development Bank

ANC, African National Congress

CAA, Constitution Amendment Act

CDP, City Development Plan

CoJ, City of Johannesburg

CR, Critical Realism

GDS, Growth and Development Strategy

GHMC, Greater Hyderabad Municipal Corporation

GoI, Government of India

HITEC City, Hyderabad Information Technology Engineering Consultancy City

IMF, International Monetary Fund

JMP, Joint Monitoring Programme

JNNURM, Jawaharlal Nehru National Urban Renewal Mission

MLP, Multi-Level Perspective

NASSCOM, the National Association of Software and Services Companies

TM, Transition Management

WB, World Bank

Lists of articles

Article I:
Nastar, M., & Ramasar, V. (2012) [1] Transition in South African water governance: Insights from a perspective on power. *Environmental Innovation and Societal Transitions.* 4, 7-24

Article II:
Nastar, M. (2014) What Drives The Urban Water Regime? An analysis of water governance arrangements in Hyderabad, India. *Ecology and Society*. Urban Water Governance Feature. In press.

Article III:
Nastar, M. (2014) The quest to become a world city: Implications for access to water. *Cities*. In review, the 2nd round.

[1] Both authors contributed equally to the preparation of this article.

I. Introduction

Water crisis due to inequality, not scarcity, say reports… (HDR, 2006)

Water crises have emerged in different forms and contexts. We see more newspaper headlines like "*Water shortages leave parts of Johannesburg dry*" or "*Water crisis looms over Hyderabad*" warning policy-makers and citizens of imminent water scarcity (Sunday Times, 2013, The Times of India, 2013). Several studies point out that water crises are seldom related to shortages of water, finance, skilled people, or technology per se, so much as to the priorities of those who make political decisions about water allocation and distribution (McDonald et al., 2011, McKenzie and Ray, 2009, Molle and Berkoff, 2009, Bakker et al., 2008, Castro, 2004, Gupta et al., 2013, Hall and Lobina, 2006, Loftus and McDonald, 2001, Swyngedouw, 2006).

Urban water scarcity is a widespread problem in many cities in the global South, but not all citizens experience it equally (HDR, 2006). At the household level, there is tremendous inequality in access to clean water and sanitation (ibid). As of 2010, 60% of the one billion people who live in urban areas in Africa and South-East Asia have no access to water pipe connections in the household plot or yard (JMP, 2013). If one takes into account the service quality (continuity, portability and purity) or affordability, the statistics are even bleaker for a great number of city dwellers.

While there is evidence of adverse impact of climate change on water resources (e.g. in South Africa and India), there is a strong argument that water crises are interlocked with the development of the water system and the governance thereof (Bakker, 2010, Gupta et al., 2013, Hall and Lobina, 2006, Molle and Berkoff, 2009, Swyngedouw, 2006). In this sense, the problem of *inequality in access to water* is increasingly concerned with social and political issues between and within different sectors of water use, such as domestic, industry (including energy) and agriculture (ibid). Therefore, understanding who are the actors making decisions about the governance of water resources and delivery of services, *to* and *within* cities, the criteria on which these decision are based and the social and environmental implications that they entail, becomes crucial in addressing inequality in access to water.

This brings us to the notion of *urban water regime*, which is understood as a complex system of municipalities, local water utilities, governmental officials,

international institutions, non-governmental organizations and the private sector wherein water polices, initiatives and reforms are made and implemented at different levels and scales. Actor interactions in urban water regimes are complex and long-term processes leading to changes in technology, policies, politics, power dynamic and economics. During this process, urban water regimes shape certain institutional, managerial, political, and social attributes, which once established resist change. Hence, understanding the mechanisms and conditions that lead to the emergence of urban water regimes in a given context is crucial to addressing the inequality in access to water that is evident in many cities in the global South.

The ultimate objective of this research is to develop a theoretical understanding of the conditions and recurring mechanisms driving urban water regimes, which in turn, lead to the inequality in access to water, applying to different groups, that is faced in many cities of the global South. In this light, the research questions are formulated as follows:

1. What are urban water regimes and what drives them? (Chapter II)
2. Why and how do they reproduce inequality in access to water in cities of the global South? (Chapter III)
3. Why are they so persistent? (Chapter IV)
4. What can be done to change the situation? (Chapter V)

A sustainability science analysis

The analysis here is undertaken within sustainability science and seeks to contribute to the further development of the field. In recent decades there has been widespread recognition that the application of disciplinary knowledge does not suffice to give an understanding of a complex process like the emergence of urban water regimes. In response, sustainability science has developed to broaden our knowledge about complex social and environmental issues. Research in this field attempts to strengthen the dialogue between society and science (Gibbons, 1999, Kates et al., 2001, Clark and Dickson, 2003, Martens, 2006, Kajikawa, 2008, Jerneck et al., 2011). Moreover, it explores interactions between society and nature while seeking to combine critical thinking and problem-solving research across academic disciplines (ibid). In addition, a combination of spatial and temporal analyses is routine in sustainability science. By integrating social and natural dimensions of sustainability, this evolving scientific field acknowledges that understanding contemporary complex problems requires new and creative theoretical and methodological approaches (Turner and Robbins, 2008, Ostrom, 2009a, Rotmans and Loorbach, 2009, Geels, 2010, Jerneck et al., 2011). This makes sustainability

science a suitable scientific field for studying urban water regimes as they are themselves complex systems comprising social, ecological and technological components that fall under the purview of different disciplines, such as sociology, political science, environmental studies, climatology, hydrology, etc. Such complex systems require a multi- scalar and multi-level perspective on the interplay between actors, the geo-historical conditions where they interact, and the relationships among these actors, for example, between policy-makers and civil society.

Epistemologically, sustainability science integrates the social and natural dimensions of sustainability in a common frame to analyze persistent problems like unequal water access in urban areas. Since its emergence in the 1990s, a variety of theoretical frameworks and methodological approaches have been applied in analyzing complex sustainability challenges, such as climate change, water shortage, biodiversity and land-use change by integrating theories, concepts, methods and knowledge from different disciplines. Table 1 shows some of these approaches.

Table 1. Examples of applied approaches in sustainability science

	The discipline / school originated from	**Central themes of analyses**	**Aims in relation to sustainability science**
DPSIR (Driving forces, Pressure,. State, Impact, and Response)	Environmental studies, European environment agency	Indicators, short term vs. long term responses, feedback loop	Develop socio-environmental indicators for policy-makers *(Edith and Rob, 1999, Carr et al., 2007)*
SES (Socio-Ecological Systems) Framework	Systems ecology, New institutional economy	Institutions, collective action, governance, polycentric systems, global to local linkages, rules of the game, resilience	Govern the commons sustainably, Make a resilient ecosystem/society *(Anderies et al., 2004, Ostrom, 2009a, Folke et al., 2002)*
Transition Framework (MLP & TM)	Science and technology studies, Complexity science, Innovation system	Transition, global to local linkages, innovation, regime shifts, governance, participation, social learning	Make sustainability transitions happen, Support action toward sustainability transitions *(Geels, 2002, Geels, 2011, Rotmans et al., 2001, van den Bergh et al., 2011)*
Political Ecology Approaches	Human geography/ Political economy	Power analysis, socio-environmental conflicts, justice and fairness, social movements	Politicize socio-environmental issues, power consolidation *(Forsyth, 2003, Robbins, 2012)*

As shown in Table 1, there are various ways of formulating social and environmental problems in the context of sustainability science. While these theoretical frameworks offer different insights about problems, they also have their own analytical shortcomings, which often stem from the school of thought in which they originate. Correspondingly, they incorporate a limited range of theories, methods, and knowledge to achieve the research goals.

Perhaps the persistent and ubiquitous problems of inequality in access to water can be analyzed through each (/combination) of these approaches. Nevertheless, the main body of the theoretical analysis of urban water regimes, in this research, is based on the transition framework, which links levels of scale and of time and provides for analysis of change dynamics, combined with insights from urban political ecology, specifically with regard to nature-society interaction. The research now presented is also inspired by the systems thinking offered by the DPSIR model, together with the concept of 'solidarity-fostering governance' which goes beyond the public-private dualism models of management offered by the SES framework (*See* Appendix). Both the transition framework and the specific approaches in political ecology are explained in detail in the next chapter.

The main rationale for choosing the transition framework and political ecology is that they recognize that natural resource governance is contentious whereas DPSIR and SES are influenced by the functionalist assumption that (an optimal) solution is always possible, meaning, for example, that sustainability challenges are always capable of being solved through policy intervention (*See* Appendix). In the water domain, the contentious aspect is evident because water is a tangible resource and, unlike energy or land, does not have alternatives or substitutes. The irreplaceable nature of water, especially under the adverse impacts of climate change, makes the governance and management of water resources even more difficult and more likely to create win-lose or even lose-lose situations. Water has recently been recognized as a human right asserting that governments have a responsibility to ensure access to sufficient, safe, and affordable water, without discrimination (UN, 2010). But growing demand for water across different sectors, such as industry, agriculture and household use, make water provision more challenging, and owing to its rival character, politics is inherent in all aspects of water governance and management. Hence, the application of the transition framework, complemented with insights from political ecology, can help us analyze urban water regimes in a coherent way, by creating and applying new perspectives to the problem of unequal water access in urban areas.

Methodology

The ontological and epistemological basis of this research stems from critical realism (CR), a philosophy of science seeking explanations for a particular phenomenon at different depths of reality (Figure 1).

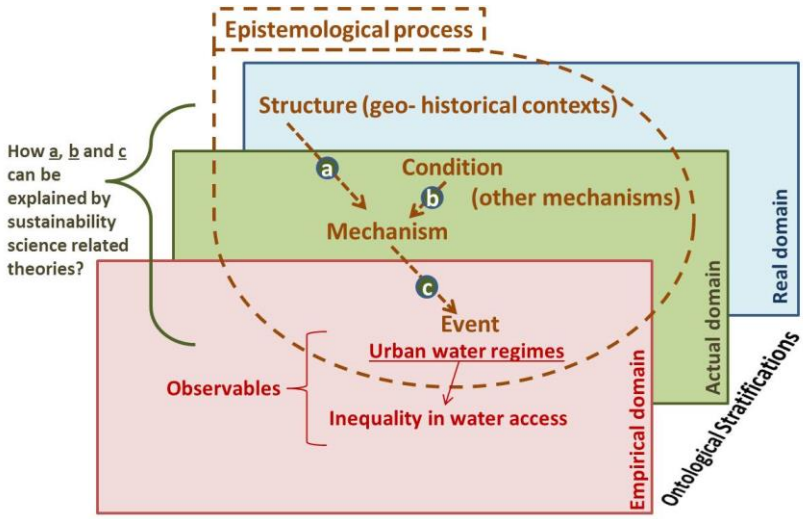

Figure 1. Critical realist view of causation and ontological stratification. Adopted from (Sayer, 2000).

The central premise of CR is that truth about a phenomenon is neither absolute nor purely relative but a matter of practical adequacy (Sayer, 2000). CR can be positioned between rival philosophical worldviews, namely, positivism/objectivism and constructivism/relativism (ibid). While the former assumes that reality is limited to observable facts that we can experience by our senses, the latter posits that reality is a construct, based on human mental activity and a set of discourses, and that there is therefore no such thing as a 'real world'.

In contrast to positivist and constructivist perspectives, critical realism (CR) argues *ontologically* that reality goes beyond what we can observe, measure or interpret based on our knowledge (Sayer, 2000). By making a distinction between reality and real objects, CR contends that reality has hidden depths that can be stratified in three domains: the empirical, the actual and the real, through which we can gain a more profound understanding of real objects (Archer and Bhaskar, 1998, Carolan, 2005, Sayer, 2000). The empirical domain contains our observations and experiences of an issue, like water scarcity or unequal access, as well as the interplay between different actors in the process of water provision. The actual domain centers on the

mechanisms causing those empirical experiences. For example, the actual domain can include social and political concerns behind water policy at national and international levels. The real domain revolves around the enduring structures that cause actual events which are geographically and historically shaped (ibid).

Epistemologically, CR focuses on necessity and contingency rather than regularity, which according to a positivist perspective, assumes there is a one-to-one relationship between structures and events in the closed systems of scientific experiments. Instead, CR posits that social open systems are more messy and ambiguous than our theories of them. Therefore, the events that can be observed are products of different causal processes (a, b and c in Figure 1) emerging from many interacting structures and mechanisms. In creating knowledge about these causal processes, CR suggests the use of different theories and methods based on the observed phenomenon (inequality in water access) and the discipline wherein the subject is studied (sustainability science).

Considering the ontological and epistemological stands above, employing a critical realist approach is beneficial for this research in two ways. First, we can go beyond the objectivism of positivists, who fail to acknowledge that there are underlying and unobservable factors and structural powers behind empirical events (Sayer, 2000). Second, we avoid the relativism of constructivists, who perceive knowledge development as the interpretation of events by different individuals and groups, and who, therefore, conclude that generalization about the phenomena that we observe is not feasible (ibid). In using a critical realist approach, there is no intention of saying there are fixed laws under which urban water regimes emerge, but instead that there might be recurring patterns in different settings leading to urban water regimes that reinforce unequal water access. Pinning down these mechanisms and conditions not only allows us to create a more comprehensive knowledge about the real world (even though it cannot be a complete reflection of it), but also gives us some ideas about where and how to begin to address the similar social and environmental challenges.

The interplay of structure and agency in CR

The use of a critical realist approach is beneficial not only when analyzing urban water regimes, but also in revealing the strategies that can affect enduring social structures that perpetuate inequality in access to water. This brings us to the interplay of structure and agency in CR. Archer (1995) suggests one of the most important philosophical interventions to approach structure, agency and social change. Concerning social structure, Archer posits in her book, *Realist Social Theory* (Archer 1995), that:

> Structures (as emergent entities) are not only irreducible to people, they pre-exist them, and people are not puppets of structures because they have their own emergent properties which mean they either reproduce or transform social structure, rather than creating it (Archer, 1995).

The importance of Archer's ontological understanding of social change is to avoid narrow methodological individualist tendencies on the one hand, and empiricist tendencies to dismiss the reality of (unobservable) social structures on the other. In line with this, Sayer (2000) argues that enduring social structures are a set of social relations that people reproduce often unintentionally, while depending on the continued (and contingent) execution of agent actions. Human actions "are not easily distinguished one from another, their goals are often unclear and their execution is always vulnerable to unexpected diversions" (Sayer, 2000). This conceptualization of the structure – agency interplay, suggests new entry points for social change.

First, Archer criticizes Gidden's structuration theory of agency-structure that postulates mutual constitution of structure and agency. In Giddens's formulation, structure is conceptualized to be the instantiation of rules and resources. Structural change occurs when agents invoke new rules gained via reflexivity and emancipatory knowledge (Callinicos, 2004, Archer, 1995). This conceptualization, especially the reduction of structure to a set of rules and of agency to individuals is criticized by many scholars who argue that this structuration theory fails to capture the set of social relations that underlie a great deal of social life and agent interactions (Archer, 1995).

Following this, Archer contends that this central conflation of structure – agency does not give room to explore analytically the influence of each aspect on the other. For Archer, instead, the structure necessarily pre-dates the action leading to its reproduction or transformation; and the structural elaboration necessarily post-dates the action sequences that give rise to it (Archer, 1995). In a sense, Archer's approach to understanding mechanisms of social change is an echo of Marx's postulation of structure and agency: 'men [and women] make their history but not under circumstances of their own making' (Karl Marx (1959) in Archer and Maccarini, 2013).

Second, Archer refutes the individualist approach of understanding human actions according to rational choice theorists who see human beings as rational agents, basing decisions on available information and constant calculation of what they gain or lose in different circumstances. According to rational-choice theorists (Shaw, 2004), reproduction of institutions and social structures are aggregated outcomes of individual actions. Correspondingly, they posit that any change in the society comes

either from changes in individual behaviors or from optimization of the "rules of the game" often according to market signals (ibid).

The shortfalls of the rational-choice paradigm and individualist views of social change are discussed at length in Archer's work (*See* Archer (2000, 1995)). Archer's ontological understanding of social change, in contrast to rational-choice theorists, posits that in society there is a variety of *emergent properties*, structural, cultural and agential, each of which is irreducible to the other and, so, has relative autonomy (Archer, 1995). In her view, the properties and powers of people are neither pre-given nor socially appropriated, instead they emerge from our relations with our environment (Archer, 2000). She continues that individuals and collective agents have the resources to act creatively in the world and, thus, can create conditions for transformation and change. Processes of change occur when people make sense of their social identity based on internal and materially-grounded conversations, rather than discourse. In other words, Archer accepts that we are confronted by the reality of society, but argues that a coherent account of the development of agents and social actors needs to be grounded in the non-discursively formed continuous sense of self.

As we will see in Chapter V, this conceptualization of structure-agency forms the hypotheses that can potentially lead to the transformation of urban water regimes, and, consequently, can contribute to addressing the problem of unequal water access in urban areas.

Research design

Proceeding from critical realism and aiming to explore the complexity of political and social issues surrounding access to water, this research strives to develop a more profound understanding of the conditions and mechanisms leading to inequality in access to water in two cities in the global South. As a comparative strategy, I use 'a most different systems design combined with the method of agreement' (Yin, 2009). This means that I look for similarities across settings that are different. For that, I design a dual case-study comparing two cities, Johannesburg in South Africa and Hyderabad in India. The dual case study design highlights a limited range of issues using the same analytical procedure and data collection methods in both cases (Kuper, 2013). This allows us to concentrate on a specific research focus, to compare more thoroughly how the subject matter unfolds in each setting, and to gain more in-depth knowledge of the studied phenomenon. Albeit the provision of water services is in focus here, sanitation or electricity could have been equally important research objects.

Both cities are flagships of their respective countries in taking steps towards creating prosperous places for their citizens by providing world-class services. In South Africa, the City of Johannesburg runs a campaign centered on the concept of "world class African city" (CoJ, 2012c), while local officials in Hyderabad, in the state of Andhra Pradesh in India, promote city development projects under the banner of "emerging world class city" (TNIE, 2012). In addition, the governments of these countries widely recognize that there is inequality between different strata of society. Therefore, water policy documents and city development plans are often intertwined with social integration policy and legislation aiming to increase public participation in decision-making processes. For example, in Johannesburg, the Growth and Development Strategy (GDS), the city strategic plan, envisions the future of the city as:

> Johannesburg – a World Class African City of the Future – a vibrant, **equitable** African city, strengthened through its diversity; a city that **provides real quality of life**; a city that provides sustainability **for all** its citizens; a resilient and adaptive society. Joburg, My City – Our Future! (CoJ, 2011a).

In Hyderabad, the improvement of the urban infrastructure, particularly water services, is promoted by the government of India through the massive city modernization plan of JNNURM, (Jawaharlal Nehru National Urban Renewal Mission) where the primary objective of the scheme is '**to create** economically productive, efficient, **equitable** and **responsive** cities'(JNNURM, 2005).

In this sense, one could argue that if we might have expected the lot of the marginalized to have improved anywhere in the cities of the global South it would be in these cities and countries, where there have been much trumpeted political changes in the direction of democratization as well as substantial levels of economic growth. But despite these ambitions and strategies, inequality in access to water has persisted even in these cities, thereby justifying this investigation into the mechanisms underlying this persistence, as explained in Chapter II. The development of the theoretical framework, its application to the cases, and the comparison of outcomes are all based on the three attached articles, which also form Chapter III. Chapters IV and V engage in a critical reflection of these analyses.

Research methods and limitations

The theoretical framework that I used to study the urban water regimes in Johannesburg and Hyderabad is developed from a review of the literature on transition studies and urban political ecology with a focus on world/global city studies (*See* Chapter II). In the analysis, I used the framework to examine the urban water regimes and their impacts on water services in the cities (*See* Chapter III).

As regards data, I traced and examined water policy documents, legislation and urban development plans at national, regional and local levels to identify actors and governance practices in the processes of extracting and distributing water in the cities as well as to capture any institutional change in the urban water regimes. Further, I followed the debate on water distribution in local newspapers and scientific journals. In analyzing the documents, I looked at how the promises of enhancing water access and services are envisioned in the public policy circle. Informed by urban theories, I looked at the implications of the city visions on paper as well as the role of different institutions shaping these visions and in operationalizing them. This process was essential to illustrate institutional, financial, technological and managerial aspects of urban water regimes and actor interactions within them in Johannesburg and Hyderabad.

In investigating the modes of water access and quality of services in these cities, I used and constructed a variety of data from official government reports, newspapers and scientific journal articles on the assessment of water provision. In Johannesburg, government reports are annually provided by the municipality, and available on the city's website to the public (CoJ, 2008, CoJ, 2009b, CoJ, 2012b, CoJ, 2011a, CoJ, 2012a, CoJ, 2011b, CoJ, 2006, CoJ, 2013, CoJ, 2009a). In Hyderabad, the data were extracted from chapters in city development plans provided by the municipality as part of an appraisal of the national urban renewal mission (GHMC, 2006c, GHMC, 2006b, GHMC, 2011, GHMC, 2006a, GHMC, 2006e, GHMC, 2006d, JNNURM, 2005, JNNURM, 2011). While the government reports reflect the overall performance of the municipality and water companies, these assessments were not always in line with newspaper reports or articles published in scientific journals. Hence, I compared and contrasted these data with primary data on modes of access and payment schemes, where field visits provided scope for reflection on the real meaning of official data that suggest almost 100% water access.

As regards on-site-visits in disadvantaged urban areas, the study builds on two weeks of intensive fieldwork in each city, in August 2010 in Johannesburg and in January 2011 in Hyderabad. In total, I conducted twenty-five in-depth interviews with residents in five settings: the two former townships of Alexandra and Soweto in Johannesburg, and the three slum areas Jagadgirigutta in Quthbullahpur, Fathenagar in Kukatpall and Secunderabad Division in Begumpet towns in Hyderabad. These areas were selected on the basis of my familiarity with the cities through other research studies. Interviews were carried out based on the residents' availability and willingness to talk. All the interviews were conducted in a structured open-ended format through a translator fluent in Zulu and English in Johannesburg and Telegu, Hindi and English in Hyderabad. In both cities, narrative walks, wherein people share their knowledge and experiences with the researcher in a storytelling style, were also used (Jerneck and Olsson, 2013).

The triangulation of data from official documents, scientific journals and in situ observations/interviews were used to compare, contrast and analyze data about actual quality of water access and services. The data were triangulated based on questions revolving around water connectivity, sufficiency of supply, water-filtering devices, water pressure, frequency of water availability, affordability of price as well as the incidence of water related diseases and predicaments in the household. As an example, I compared the definition of water coverage in the official documents with observation from the field and interviews with people as well as data obtained from other research studies, all confirming that what is considered to be sufficient water use per person scarcely matches the actual needs of households on the ground. Therefore, what constitutes promising and successful governance practices in terms of water coverage does not necessarily mean that people in these areas have no difficulty in access to water. These research methods are further elaborated in the attached articles (*See* Article I and II).

Here it is important to note that the emphasis of this research is to understand the persistent and ubiquitous problem of evident inequality in access to water that applies to different groups, which is hypothesized to be an outcome of systematic features of locked-in urban water regimes. Water is essential for the sustenance of life and, therefore, water services should be provided by society to all its members on a principle of justice without being subject either to the potential arbitrariness of political whim or to the harshness of market forces but should rather fall in the realm of human rights.

This, in turn, excludes a number of areas of research, e.g., how citizens perceive inequality in water access, how they deal with it on a daily basis and how they see the ways out of it. Addressing these questions would require ethnographic research wherein more active participant observation might help to broaden knowledge about the implications of the problem. Nevertheless, these potentially interesting topics and research methods remain outside the scope of this research.

II. Understanding driving forces behind urban water regimes

This chapter outlines the theoretical framework used to analyze urban water regimes and to identify mechanisms shaping their characteristics. This entails an overview of the transition framework, urban political ecology insights and how they can be integrated.

A transition perspective

Centering on sustainability transition processes, the transition framework is a systematic approach to address the complexity of sustainability issues in functional domains like agriculture, health care, transport, water, food and, energy (van den Bergh et al., 2011). Sustainability transitions are conceptualized to entail changes in technology, culture, policies, politics, power and economics, meaning that a wide range of vested interests are involved in these processes promoting particular solutions, policy instruments or packages (Geels, 2011). This makes the concept of sustainability transitions political, normative and contested (Geels, 2011, Loorbach et al., 2011, Meadowcroft, 2011).

Transition thinking is essentially concerned with tackling persistent social problems by capturing all dimensions of change in technology as well as in social, economic and institutional conditions, in order to explain major transitions in a specific domain. In doing so, transition analysis involves applying combinations of different disciplinary and inter-disciplinary concepts (e.g. complex system theory, social studies of technology and governance) to analyze the interplay of actors at different levels (macro, meso, micro) leading to different transition pathways, as shown in Figure 2.

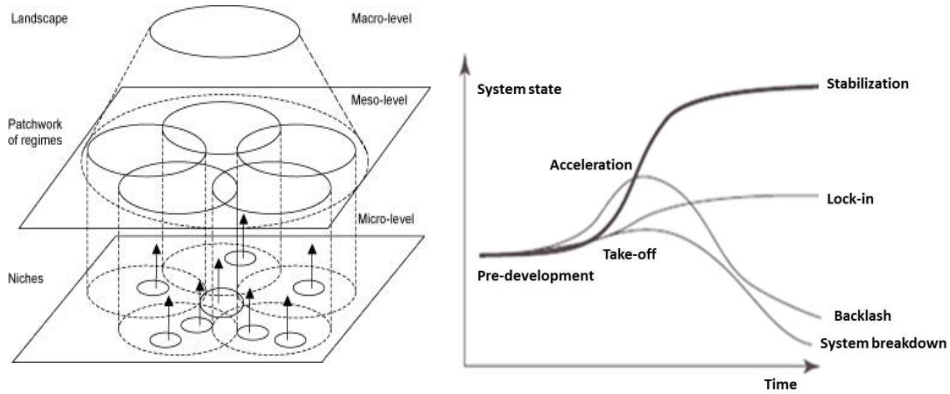

Figure 2. The multi-level and multi-phase perspective
(Geels, 2002, Rotmans et al., 2001)

The focus in transition studies is on regimes at the meso level and their interaction with niche actors at the micro level, and with landscape pressures at the macro level. In this research, the attributes of urban water regimes and inequality in the terms of access to water are deemed to be manifestations of unsustainability of urban water systems. Changes in such systems can be characterized by a complex and long-term process comprising multiple actors at different scales and levels. This process entails changes in technology, culture, policies, politics, power and economics where a wide range of vested interests are involved to promote particular solutions, policy instruments or packages. The complexity of this (so called) transition process requires interdisciplinary frameworks that can explore processes of change from different disciplines and social perspectives (Geels, 2002, Geels, 2010, Geels, 2011, Loorbach, 2007, Loorbach et al., 2011, Rotmans and Loorbach, 2009, van der Brugge et al., 2005, Meadowcroft, 2011).

In the water domain, the usefulness of transition thinking is illustrated by several case studies analyzing societal changes in the water governance systems (van der Brugge et al., 2005, Pahl-Wostl, 2007, van der Brugge and Rotmans, 2007, Holtz et al., 2008, Brown et al., 2009, van de Meene and Brown, 2009). First, the framework offers a frame to discuss differences in perception, ambition and understanding of sustainability as a normative goal, and to orient these aspirations into efforts in a systematic way (Meadowcroft, 2011). Second, the transition heuristic allows incorporation of different theories to be combined to explore the intricacy of interactions among critical components of a water governance system, i.e. water legislation, policies, and reforms, civil society, policy-makers and water organizations (Geels, 2010). By employing different social theories within a transition framework, governance practices and their role in change processes can be more comprehensively analyzed and assessed. Third, the transition heuristic comprises a practical toolbox of participatory techniques to choose from and to scale

up successful experiments to achieve the sustainability objectives in given cases (Rotmans and Loorbach, 2009). Below is a description of the three main concepts in the transition framework. Some of the criticisms of the framework are then outlined.

A multi-level perspective

Transitions can take place when developments at landscape (macro), regime (meso) and niche (micro) levels (Figure 2) move in the same direction (Geels, 2002). Landscape acts as a peripheral structure in which regimes and niches interact with each other. Developments at this level are relatively slow and correspond to the broad societal trends such as climate change, technological development, population, international agreements, and MDGs as well as dominant discourses (Geels, 2002, van der Brugge et al., 2005). The regime may be defined as any form of rules enabling or constraining human activities within communities, such as economic rules, legislation or social conventions (Foxon, 2002, van der Brugge et al., 2005). Geels (2011) defines the regime as an interpretive analytical concept referring to the 'deep structure' and stability of an existing system (ibid). The regime is defined as the 'deep structure' consisting of a set of institutional settings that support and reinforce predominant technology, politics, markets, user preferences, legislation or social conventions (Foxon, 2002, Geels, 2002, van der Brugge et al., 2005, Geels, 2011). The concept of urban water governance broadly corresponds with this definition of regime. Finally, the niche level can be described as the experiments and projects formed by a small group of agents that deviate from the regime (Geels, 2010, Loorbach, 2010). These experiments can be scaled up by different means such as technological innovations or through various types of social mobilizations (ibid).

A multi-phase perspective

The transition trend is the consequence of shifting from one dynamic state of equilibrium to another (Figure 2). This conceptualization of transition as an S-shaped curve is built on the theory of innovation diffusion in which the process of system transformation or regime-shift unfolds over time (de Haan and Rotmans, 2011). Innovation diffusion is conceptualized as having four main phases. *Pre-development* is the first stage of transition, where marginal changes occur in the background of the system and have no impact on the "business as usual". The second stage is a *take-off phase* in which elements of the structure of the system start to change gradually. Third comes an *acceleration phase* where the new and emerging pattern of the system becomes visible because of accumulation of the changes in the previous stages. Finally, there is a *stabilization phase* where the rate

of fluctuation is marginal, and the net effect of any changes is neutral (van der Brugge et al., 2005). As shown in Figure 2, not all phases necessarily occur in the actual form of the S-shape or fully-concluded transition. They can pass quickly (leading to a backlash situation) or take decades (leading to a locked-in situation). In a sense, the multi-phase perspective acknowledges that trends of change can be reversed or can stall and that transitions seldom take the form of a linear, progressive trend that ends with regime changes.

When using the transition framework, it is assumed that transitions (towards acceleration) are driven by two mutually reinforcing mechanisms. First is the destabilization of the dominant regime due to landscape pressures, and second is the emergence and up-scaling of niche experiments, e.g., in terms of policy, behavior, technology, etc. (van der Brugge and Rotmans, 2007). In the absence of one of these mechanisms, transition pathways may develop into a lock-in situation. In transition studies, lock-in is considered as one of the transition pathways in which the regime is able to maintain and reproduce its internal dynamics (Geels, 2002, Rotmans and Loorbach, 2009). This can be seen as an exertion of power by the current regime to prevent a change in the status quo. As a result of this process a set of actions and strategies that could be taken in the future will be limited or constrained by the current regime practices (i.e. actions taken by the regime actors, including institutions). In addition to this "non-ideal" transition pattern, there is a risk of "reverse" transition in which niche experiments fail to become the new mainstream, and the system returns to its earlier state. This "backlash", is identified as a possible transition pattern and a special case of lock-in (ibid). It is suggested that it is at these points that overt conflict occurs and the influence of different actors diverges. Using a multi-phase perspective may provide an opportunity to identify moments of contestation and changing power relations during a transition.

A transition management perspective

In changing regimes, one of the dominant transition pathways, among others (e.g. transformation, reconfiguration, technological substitution, de-alignment/re-alignment) is offered through the transition management cycle (Loorbach et al., 2011, Rotmans and Loorbach, 2009, Geels, 2011). At the center of this bottom-up model of change, lies the importance of building protected space for niche experiments, in which actors use social learning processes to acquire knowledge leading to a new perspective on a transition issue thus challenging regime practices (ibid). Transition management encompasses the stages of scoping, envisioning, experimenting and learning, which is intended to engage stakeholders in the process of change management in a domain, such as water (Loorbach et al., 2011, Rotmans and Loorbach, 2009). Transition management highlights the impact of "transition arenas" particularly at niche level. A transition arena is a virtual network consisting

of regime actors, niche actors and outsiders in which the process of transition management takes place. The transition arena is guided by transition managers, who facilitate discussion towards convergence of perspectives, assumptions and ambitions, thus creating shared visions among stakeholders of alternative, viable and desirable futures that can influence the regime (ibid). Focusing on niche actors with innovative competencies, creative minds, strategists and visionaries, this arena is meant to stimulate the formation of new coalitions and networks to create alternative pathways to transform regimes, or in other words, make sustainability transitions occur (ibid). In this context, it is hypothesized that actively communicating the shared vision and transition pathways into other networks will encourage people to join the innovation network and build joint strategic agendas (ibid).

Critics

The transition framework has attracted various types of criticisms that have been acknowledged and addressed at length in the recent transition studies literature (*See* Geels (2010, 2011)). Some of the critiques have led to essential contributions to expanding the framework (van den Bergh et al., 2011). For example, several scholars have drawn attention to the conceptualization and application of power dynamics between and within levels (van den Bergh et al., 2011).

Others have highlighted the importance of multi-relational interactions and 'flat ontology' at each level (Shove and Walker, 2010). They have argued that the "nested hierarchy" concept misses out the importance of local practices whose horizontal/flat circulation can be the trigger for transition (versus vertical/hierarchical niche-regime interaction). This argument is acknowledged by Geels (2011), who points out that one should not only look at the niche networks under the regime level to understand how niches scale up, or how the regime reproduces itself. It is equally important to scrutinize the interaction within a network of heterogeneous niches and how they communicate with each other.

In addition, the transition framework has been criticized for underplaying the role of agency in transitions (Smith et al., 2005). There is a concern that the transition heuristic is too structural and therefore leaves little room for the analysis of agency. Geels (2011) responds by suggesting the multi-level perspective (of a transition) is "shot through with agency" (Geels, 2011) and that social changes are only possible through the actions of agents. Nevertheless, he acknowledges that certain types of agency are less developed in the transition heuristic. Chapters IV and V below discuss the role of different agents, and especially how agents at different levels of the system might create scope for agency by others at other levels.

Another important critique relevant for the analyses here is related to the ambiguity of the regime concept and its application to empirical cases (Berkhout and Smith, 2004, Genus and Coles, 2008, Markard and Truffer, 2008). Criticisms of this aspect often revolve around the problem of drawing boundaries for the regime both in terms of conceptualization and in terms of application. For example, Genus and Coles (2008) have contended that the MLP framework can only offer a heuristic device to organize sets of data but no critical discussion on choices and definitions of niche, regime and landscape levels. Hence, they have offered a constructivist approach, based on actor-network theory to construct and identify actors, networks and interactions (ibid). Markard and Truffer (2008) who argue that the regime concept can be interpreted both as a rule set and as a system have concluded that the regime should be elaborated and coherently justified before it is applied. In response, Geels (2011) states that MLP does not prescribe how broad or narrow the concept of regime should be. Instead, the analyst should articulate the concept based on the object of analysis. Therefore, what constitutes a regime depends on the subject matter and theories utilized to investigate it.

In an attempt to delineate the concept of regime in connection with water governance analyses, Holtz et al. (2008) describe different characteristics of a regime, such as the autonomy, coherence, heterogeneity, purposefulness, and stability of actors. These attributes, in sum, indicate that regimes are autonomous and stable societal systems that serve one or several societal functions bearing on human needs while comprising multiple and heterogeneous actors (Holtz et al., 2008). Inspired by new-institutionalism considerations, some researchers have contributed to the delineation of urban water regimes by focusing on technological aspects of water organizations as well as regulations, norms and values embedded in the management of water resources and services (Pahl-Wostl et al., 2007, Brown et al., 2009). However, in this dissertation, the aim is to contribute to the development of the concept through empirical demarcation of the urban water regime in selected case studies. The focus here is on socio-political aspects of the regime by incorporating insights from political economy and ecology in which the politics of governance arrangements is discussed and the impacts on water access and distribution are outlined (Loftus and McDonald, 2001, Castro, 2004, Heynen et al., 2006, Bakker, 2010). These insights are elaborated in the next section.

Last but not least, the processes of niche empowerment though the transition management cycle are questioned (Smith and Stirling, 2010, Smith et al., 2005). In the transition framework, socio-technological niche experiments are seen as bottom-up governance initiatives intended to challenge regime practices and achieve sustainability goals. In terms of operationalization of these arenas, the transition management literature suggests the involvement of visionary frontrunners and their actor-networks to create new narratives to the evolving scientific agendas and on-the-ground experiments (Brown et al., 2013). This process is assumed to lead to new

institutional structures and enabling administrative tools. However, the critics interpret this as a highly technocratic vision (Smith and Stirling, 2010). The critics point to challenges to participatory platforms in terms of leadership, the clash of interests and values in prioritizing sustainability visions and naïve optimism about confronting the deep structure of regimes through adaptive and reflexive governance activities at micro level. Therefore, they call for a broader political project wherein reflexive governance can be practiced by social groups and movement lobbying to get their voices heard and prioritized by political and economic elites (ibid). By acknowledging this point, this study pays particular attention to socio-political niche experiments as explained in chapters III and IV.

The basis of all the criticism above may perhaps be related to dominant theoretical assumptions used in the transition framework, namely evolutionary economics and structuration theory, to analyze the regime structure and interplay of actors at different levels (Geels, 2010). Evolutionary economics assumes that the core drivers for transitions are based on entrepreneurs and radical innovations leading to the transformation of locked-in regimes (Schumpeter 1939 in Geels 2010). Structuration theory assumes that actors are knowledgeable agents who actively interpret the rules constraining their actions and who are therefore capable of re-structuring the currently established arrangements through their cognitive capitals, i.e. competences, skills, knowledge, etc. (Giddens 1984 in Geels 2010). The common denominator in most of the criticism is the neglect of other social theories, particularly insights from conflict theory in capturing the interaction between and within different levels (Smith et al., 2005, Avelino and Rotmans, 2009, Lawhon and Murphy, 2011). The transition framework is, however, a middle range theory[2] that can accommodate different theoretical positions (Geels, 2010). Although it is fair to say that a great deal of research in transition studies has a strong reliance on the theories noted earlier, this does not necessarily exclude the possibility of using other theories to explain the dynamic of transition processes. In order to broaden the scope of transition studies to other theoretical understandings of urban water regimes, the present study incorporates insights from critical urban theory/urban political ecology.

[2] According to Merton et al. (1949) middle range theories focus on delimited topics, make explicit efforts to combine concepts, and search for abstracted patterns and explanatory mechanisms. "The MLP is such a scheme that relates various concepts and uses empirical research to identify recurring patterns and generalizable lessons" (Geels, 2011).

Critical urban theory

Critical urban theory is a school of thought in urban theories (Table 2) that originates from the political economy perspective developed by Marxist scholars in the early 1970s who began to build the most substantial alternative to the view of the Chicago School in urban studies (Ritzer, 2004).

Table 2. Theories of urbanizations

Schools of thought	Focus on	Some of the leading scholars
The German Perspective	Impersonality, anonymity, and economic exchange in the metropolis	Georg Simmel, Ferdinand Tönnies
The Chicago School	Micro-scale social interactions, Ethnocentric approaches, City developments through the lens of Darwin's evolution theory	Robert Park, Ernest Burgess, Louis Wirth
The Political Economy Perspective	Processes and impacts of capitalism in urban areas, inequality, social actors	Henri Lefebvre, Manuel Castells, David Harvey
Modern Forms of Urban Growth	The Megalopolis, Suburbanization, Edge Cities, Global Cities	Jean Gottesman, Kenneth Jackson, Joel Garreau, Saskia Sassen

Source: (Ritzer, 2004)

Brenner et al. (2011) summarizes critical urban theory with reference to four key propositions. First, it is a theory in the sense that it is abstract regarding the nature of urban processes under capitalism, and is not intended to serve as a formula for any particular course of social change. It rather focuses on a moment of abstraction that is analytically prior to the questions of "what is to be done?" (Brenner et al., 2011). Second, critical urban theory is reflexive and deals with the question of how oppositional, antagonistic forms of knowledge, subjectivity and consciousness may emerge within a historical social formation and through power relations (ibid). Third, critical theorists are engaged with normative questions rather than referring to the question of how to apply theory to practice. They reject instrumentalist and market-driven forms of urban analysis that promote reproduction of existing urban formations (ibid). And finally critical urban theory emphasizes the disjuncture between the actual and the possible, meaning that it strives to reveal possibilities for alternative, radically emancipatory forms of urbanism that are embedded within, simultaneously suppressed, contemporary cities (Brenner et al., 2011).

Urban political ecology is a more specific school of critical thinking which centers on environmental issues in relation to urban areas (Heynen et al., 2006). The field of urban political ecology translates these arguments into the urban context and seeks to highlight the importance of the ecological in urban theory, for example by showing the driving forces behind environmental issues (Heynen et al., 2006). The central message emerging for this field is that:

> While understanding of the changes that have occurred within urban environments lies at the heart of political-ecology research, they must be understood within the contexts of the economic, political and social relations that have led to urban environmental change. It is therefore necessary to focus on the political economic processes that bring about injustice and not only the natural artefacts that are produced through these uneven social processes (Heynen et al., 2006).

Urban political ecology often engages with normative questions regarding the nature of urban processes under capitalism. This field, in short, provides insights from critical thinking traditions (e.g. theories of neoliberalism, post-colonial theory, gender studies, etc.) to be applied to subjects like environmental justice, urban conflicts, etc. It also seeks to throw light on radically emancipatory forms of urbanism through the study of historical and contemporary urban movements within suppressed cities (ibid).

There is a large body of literature on urban water regimes drawing on the politics of governance arrangements, and how they affect water allocation and distribution in cities (Loftus and McDonald, 2001, Castro, 2004, Swyngedouw, 2006, Bakker, 2010). Such research often investigates the political and economic processes and struggles that shape and reshape water policies and practices from a critical urban perspective (ibid). Within this field, the concept of urban water regime focuses on formal and informal institutional arrangements of private and public actors that deal with the regulation of water in an urban region. Hence, urban water regimes are conceptualized in relation to economic, social, cultural, political and ecological institutions and activities on other scales than merely the local (Heynen et al., 2006). In a sense, the concept of regime is ultimately concerned with regulation, property rights and ownership (ibid).

This conceptualization is used in the next chapter to complement the earlier definition of urban water regimes and to investigate the extent to which the problem of inequality in access to water is rooted in a capitalistic conceptualization of rights and responsibilities over water and its management.

III. Inequality in access to water in the global South

This chapter, built on the three attached articles brings out the salient features of the urban water regimes in Johannesburg (*See* Article I) and Hyderabad (*See* Article II) and compares the mechanisms driving these urban water regimes (*See* Article III).

For the first time in history, the majority of the world's population lives in urban areas. Most of current urbanization, 93%, takes place in the rapidly growing cities of the global South (UNSECO, 2010). Economic activities and growth on the one hand and environmental concerns, including impacts of climate change on water resources, on the other, impose enormous challenges in meeting citizens' water demands.

Physical water availability is predicted to worsen in many countries, particularly in the near East and North Africa as well as Mexico, Pakistan, South Africa, and large parts of China and India, which already suffer from acute water shortage (World Water Assessment Programme, 2012). Based on IPCC reports (Bates et al., 2008), in South Africa, the water supply is decreasing because of declining precipitation and increasing evaporation. India will reach a state of water stress before 2025 when the availability is predicted to fall below 1000 m3 per capita (ibid). How rainfall distribution over space and time is affected by climate change is also of concern in India; intense rain occurring over fewer days, which implies increased frequency of floods resulting from extreme rainfall during the monsoon, will also reduce the potential for recharging groundwater (ibid). In the recent decades, the intensity of extreme rainfall has increased over coastal Andhra Pradesh and its neighboring areas, Saurashtra and Kutch, Orissa, West Bengal, parts of northeast India, and east Rajasthan (Guhathakurta et al., 2011).

Water scarcity, however, is a matter not only of the lack of availability of water resources, but also of the lack of access to safe drinking water and sanitation (WHO, 2013). In many developing countries in Africa and South Asia, more than 50% of the population are slum dwellers with little or no access to shelter, water and sanitation services (UN-HABITAT, 2010a). This begs the question how urban and water organizations at national and local governmental levels govern and manage

water resources and handle issues of access and distribution to quench the urban thirst.

In the context of the global South, the governments of South Africa and India have made remarkable progress in improving access to water as shown in Table 3.

Table 3. The status of access to drinking water in South Africa and India

		Drinking Water					
		Urban Improved			National Improved		
Country	**Year**	**Total Improved (%)***	**Piped on Premises (%)****	**Other Improved (%)*****	**Total Improved (%)***	**Piped on Premises (%)****	**Other Improved (%)*****
South Africa	1990	97.9	86.0	11.9	**82.6**	55.9	26.7
	2000	98.3	87.0	11.3	86.5	61.7	24.8
	2010	99.0	88.7	10.3	**91.4**	68.6	22.8
India	1990	88.7	47.8	41.0	**70.3**	17.0	53.3
	2000	92.4	49.3	43.1	80.6	20.8	59.9
	2010	96.0	50.8	45.1	**90.7**	24.8	65.8

Source: (JMP, 2013).

* Percent of the urban population and of the national population, respectively.

** "Piped on premises" comprises piped water into dwelling, yard or plot

*** "Other Improved" comprises public tap or standpipe and protected well or borehole

The figures between 1990 and 2010 indicate that access to drinking water has improved in both countries, from 83% to 91% in South Africa and from 70% to 91% in India. Over the same period, the proportion of people living in urban areas increased from 52% to 62% in South Africa and from 26% to 31% in India, following the idea that "no country has ever achieved sustained economic growth and rapid social development without urbanization" (UN-HABITAT, 2010b). According to this logic, urbanization is expected to make countries rich because high population densities in cities reduce transaction costs and public spending on infrastructure, leading to attracting the fast growing sectors of an economy into cities (ibid). Figure 3 shows the population density of South Africa and India.

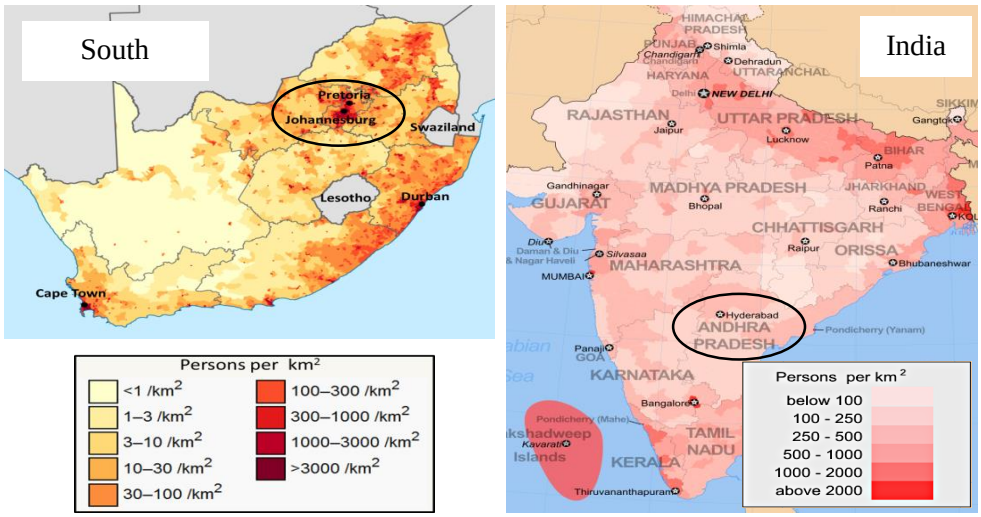

Figure 3. Population density in South Africa and India

Sources: (StatSA, 2005, CC, 2006)

As cities grow, local water resources may no longer be sufficient to enable water utilities to provide adequate supplies to the municipal users on a sustainable basis. More importantly, the fast growing urban centers in South Africa and India (as also in many other Southern countries) are located in semi-arid and arid areas in which rainfall is erratic, making the supplies from local water bodies such as ponds and wells unreliable (Lundqvist et al., 2003). Growing rates of urbanization and increased economic activities force these cities to depend heavily on long-distance transfer of water (ibid). This imposes enormous social and environmental challenges both on the hinterland and within the cities (ibid). For example, municipal and industrial water uses in developing countries are expected to double between 1995 and 2025 compared to the increase of irrigation water use by only 4% (HDR, 2006).

Along with accelerated economic growth, social inequalities have increased in the last decade in both countries thus perpetuating the social differentiation that is historically rooted in the apartheid system in South Africa and the caste system in India (ADB, 2012, Heller, 2009). While formal constitutional democracy has been consolidated in both countries, there is little evidence of active engagement of subordinate groups in shaping public policy (Heller, 2009). Unequal access to education, health and public services such as water and electricity has hindered opportunities for low-income households to raise their living standards (ibid).

In response, both governments have developed a great number of urban and water policies to realize their aspirations to fulfill world-class water provision. In South

Africa, the City of Johannesburg runs a campaign centered on the concept of "world class African city" (CoJ, 2012c), while local officials in Hyderabad, in the state of Andhra Pradesh in India, promote city development projects under the banner of "emerging world class city" (TNIE, 2012). The world-city initiatives in each of the two cities acknowledge the importance of social integration while promoting economic growth (JNNURM, 2005, CoJ, 2006). Therefore, in city development plans, the economic growth is envisioned to be shared in a way that enables all citizens to have access to world-class services.

By analyzing these plans and policies and the processes through which these have been developed and implemented, I examine in what direction the water sector is developing, as well as the role different actors play in the process and to what extent they meet the world-city promises.

Johannesburg, South Africa

Johannesburg, with nearly 4 million inhabitants and an annual population growth rate of 1.3% is a prominent destination for both domestic and international migrants (CoJ, 2012b). From being an economy originally based on mining, Johannesburg's economic structure has undergone important changes over the last decade and is now much more diversified.

In South Africa, the evolution of water service delivery and the country's political history are inseparable (Tewari, 2005). In the democratic dispensation starting in 1994, particular attention was paid to sectors such as water services. Water was previously distributed in a systematically inequitable manner across racial groups, with a specific focus on meeting the needs of whites and excluding Africans (ibid). The new water laws sought to address the social inequality and environmental concerns of the earlier political period. The significant change brought about by the new legislation was the recognition that water is a scarce and unevenly distributed resource, belonging to all people and no discriminatory law should be established to prevent water access and the aim should be sustainability of distribution enabling all users to derive benefits (RSA, 1997). In 1994, the new government thus had the responsibility to manage the water resources sustainably, for the benefit of all people according to the constitutional mandate (s. 3, RSA, 1996).

Despite these institutional changes, access to water stands in stark disparity. In Sandton, highly paid professionals can enjoy strolling in *Africa's richest square mile* and its exclusive world class facilities with access to unlimited supplies of water for different uses, including the filling of swimming pools and fountains (Narsiah, 2011). Dwellers in Alexandra, a few kilometers east of Sandton, do not have the privilege of benefiting from their world-city's amenities (Narsiah, 2011). In

Alexandra, water access ranges from 133 persons per tap in Old Alex, to 7 persons per house in the East Bank, to less than 5 in Sandton where most houses have more than two taps and toilets (Nastar and Ramasar, 2012, ARP, 2005). Likewise, in Phiri in Soweto, people with low incomes live in backyard shacks where access to water is constrained by pre-paid water meters (Ballard et al., 2005, Barnes, 2009, Narsiah, 2011). People who are poor have become increasingly marginalized with minimal support from the state, while the wealth remains in the hands of the elite, i.e. old whites and the emerging black elite and a growing black middle-class (Murray, 2011, Clarno, 2013). Observations from the fieldwork, which is in line with several other studies, indicate that Johannesburg has not been able to catch up with its world-class image in terms of spatial integration and equalization of the opportunities and water access across the city (Murray, 2011, Bond and Dugard, 2008, Narsiah, 2011, Narsiah and Ahmed, 2012, Nastar and Ramasar, 2012).

Hyderabad, India

Hyderabad, the capital of Andhra Pradesh, is the fourth most populated city in India with approximately 6 million inhabitants (George et al., 2009). With an annual growth rate of 3%, the population of Hyderabad is expected to reach 15.1 million by the year 2031(GHMC, 2006a). Part of this growth is attributable to a significant economic expansion focused on the IT sector. According to NASSCOM [3], the IT–BPO [4] sector in India, with aggregate annual revenues of US $100 billion, has increased its contribution to India's GDP from 6.4% in 2008 to 7.5% in 2012. As of 2012, the industry continues to provide direct employment to about 2.8 million, and indirectly to 8.9 million people. Hyderabad is one of the cities at the center of this IT boom (NASSCOM, 2013).

The urban poor in many Indian cities are mainly concentrated in slum areas. In fact, 44% of all urban households in India are classified as (notified) slums[5] where water supply and sanitation services face major constraints, such as limited financial resources, inadequate operation and maintenance capacity, etc. (UN-HABITAT, 2010b). As of 2010, more than 50 percent of around 400 million Indian city dwellers had no access to water pipe connections within their household plot or yard (JMP, 2013). If one takes into account both the service quality, such as intermittent supply

[3] The National Association of Software and Services Companies (NASSCOM) is a trade association of Indian Information Technology (IT) and BPO industry

[4] Business Process Outsourcing (BPO)

[5] Notified slums, those that are notified by municipality and other local authorities and are legally entitled to government provision of basic services.

and inferior quality, and its affordability, the figure is even less favorable for most urban dwellers, who currently constitute one-third of the total population of 1.2 billion.

In enhancing efficiency in public service provision, the Ministry of Urban Development (MoUD) instigated a series of institutional, fiscal and financial reforms under the 74th Constitutional Amendment Act of 1992, with the aim of strengthening municipal-level governance (MoUD, 2012, Ruet and Lama-Rewal, 2012). The Constitution Act provides a basis for state governments to delegate responsibility for providing electricity and water services to urban local bodies and thus make the local government more responsive. The 74th Constitution Amendment Act (CAA) implies a decentralized and self-sufficient governance system. This is an attempt to ensure local cultural and political autonomy by diffusing social and political tensions at different scales and levels of government (ibid). In Hyderabad, the water coverage is reported to be 95 percent of the total population of the city (WSP, 2008, GHMC, 2006c) and 90 percent in slum areas (GHMC, 2006d).

In spite of these figures, "Cyberabad" (as it is known because of its technology hub) can also be characterized in terms of spaces of exclusion and disconnection for the poor. The well-paid IT professionals are rarely confronted with water interruptions at home or at the work place. By contrast, the low-paid working class as well as (formal) unemployed people often reside in slum areas or in squats, which lack basic amenities. During a two-week stay in a neighborhood close to HITECH city (Madhapour) in the course of fieldwork, I occasionally experienced water disruptions, while within walking distance there were plenty of informal settlements and squatters living a 'bare life' existence (Sylvester, 2006). The process of city beautification under JNNURM led to a dramatic increase in land and real estate prices that even affected the middle class in their ability to access formal housing in the metropolitan cities (Mahadevi, 2011, Zoomers, 2010).

This pushed thousands of families, mostly slum dwellers, to fringe areas under the BSUP[6] of the JNNURM resettlement programs, or sometimes dispossession even without any legal backing (Mahadevi, 2011, Sharma, 2010). A lucky few, will be

[6] Basic Services to Urban Poor (BSUP) is one of the JNNURM submissions under which "all slum dwellers must be provided with security of tenure". As far as possible, city governments must try to provide tenure/patta to slum dwellers on-site or at sites nearby (within 1-2 kms. radius) existing settlements to ensure that their livelihoods are not affected. Only those slums that are non-tenable may be relocated; that is those that are located either on infrastructure pathways, land sites marked for major development projects in the city or where sites are near areas which can pose health risks such as large drains, land fill sites, etc.

relocated to the peripheries under the BSUP housing project, although their livelihood and living conditions, including access to water, are reported to be affected adversely (Chaplin, 2011, Kundu and Samanta, 2011, Sharma, 2010, Mahadevi, 2011). In low-income areas, the water connection is often shared among a group of households, making the water bills much higher than single household usage since the billing calculation is made on the basis of increasing block tariffs (HMWSSB, 2008). In more than 90% of cases, water consumption among users with private metered connections (mainly middle and upper class) falls under the first couple of blocks of water tariffs (up to 30 kilo-liters per month) where water is highly subsidized and relatively cheap, less than 12 Rs per kilo-liter (HMWSSB, 2008, Ramachandraiah and Vedakumar, 2007, Whittington, 2003). On the other hand, users sharing only one connection end up paying more per kiloliter since higher blocks of water tariffs are not subsidized. In slum areas, where dwellers have no access to the water network, the situation is even worse. Poor households rely on tankers or cart vendors charging 2 to 20 times more per liter of water as compared to households with regular water network connections (Davis et al., 2008).

The poor quality of water access and delivery has resulted in many health issues such as gastro-enteritis, dysentery, liver enlargement, malnutrition, ringworm, scabies and other skin diseases (McKenzie and Ray, 2009). This was also confirmed by interviews in the three study sites where respondents raised their concerns about diseases like diarrhea, stomach problems, and skin rashes that might be related to water quality. As stated by interviewees, the high price of drinking water treatment devices has made access to purified water very expensive, and in some cases, unaffordable.

Interplay of landscape, regime and niche levels

As briefly mentioned above and explained at length in the articles, despite the promising urban plans and water policy in the case-study cities, provision and distribution of water to the users have been on an unsustainable basis as summarized in Figure 4.

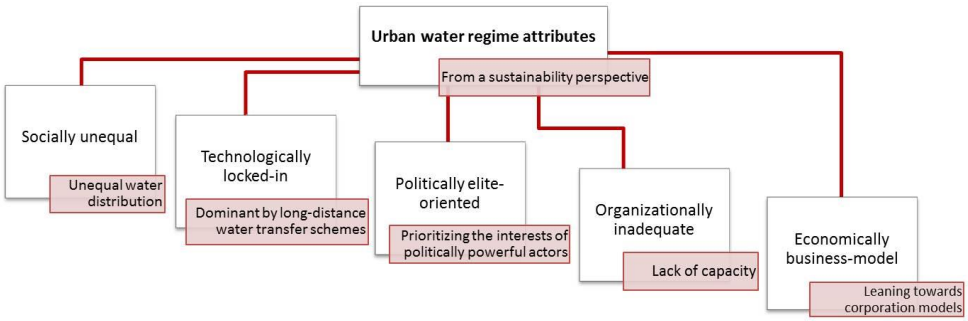

Figure 4. Salient attributes of the urban water regimes in Johannesburg and Hyderabad expressed in conceptual terms.

The urban water regimes in Hyderabad and Johannesburg follow the ideology of water as an economic good in which public-private partnerships pave the way towards privatization of water services. In fact, privatization of water service delivery has already started in Delhi (The Times of India, 2012, The Times of India, 2011). As in many other developing countries, the urban water regime is dominated by technocratic approaches by which long-distance transfer of water to secure city development is promoted. This is often done without considering environmental damage and impacts on agriculture. From a distributional perspective, there is an apparent inequality in access to water services. While high and middle-income earners benefit from the organizational reforms in water service delivery and have access to improved services, urban low-income earners are largely excluded (*See* Article II). This is far from fulfilling the objectives of the water initiatives and the pro-poor policy (*See* Article II and III).

In understanding the mechanisms shaping the regime, Geels (2011) highlights the role of landscape pressures on the regime as well as their influence on niche experiments. The interaction of these levels and how they eventually lead to inequality in water access in our examples is explained below.

The world-city formations and commercialization of services

As discussed in Article III, there has been a neoliberal shift at the landscape level, which has resulted in the formation of world cities. These cities are the hosts of the headquarters of large corporations, especially those operating globally, and which require advanced services and telecommunications facilities to implement and manage global operations such as accounting, banking, finance, insurance, advertising, etc. (Brenner, 1998, Sassen, 2002, Sassen, 2003). The concept of global cities, according to Sassen (2006), is attuned to social polarization and increasing inequality. The growing numbers of well-paid professionals and profitable specialized service firms on the one hand, and (informal) low-paid service and manufacturing jobs with poor working conditions, often occupied by immigrants unable to work legally, on the other, lead to social polarization in global cities (Sassen, 2006).

In a similar line of thought, Mike Davis, in his book, 'Planet of Slums' argues that global shrinking of manufacturing employment, driven by labor saving technologies combined with the fast-growing service sector in the global South, has transformed a majority of urban dwellers into "surplus" whose members are relegated to informal work with insufficient income and resources to pay for basic services (Davis, 2007).

Market mechanisms tend to polarize wealth and power and to strengthen the relative position of those who are already relatively strong. In a globalized world the advantage lies with countries, companies and people with the financial, technical, infrastructural, social, institutional and organizational capital needed to be competitive and those with asset mobility. Harvey (2008) points out that urban restructuring through world class city rhetoric nearly always has a class dimension since "it is the poor, the underprivileged and those marginalized from political power that suffer first and foremost from this process" (Harvey, 2008).

Therefore, the main impact of neoliberalism as a landscape factor in urban water regimes, is redistributive in terms of canalizing wealth and income either from the mass of the population toward the upper classes or from the vulnerable to richer

countries. By conceptualizing this process as creative destruction[7], Harvey (2006) contends that the creative tactics, i.e. corporatization, commodification, and privatization of hitherto public assets, lead to reinforcing the hierarchical class structure and eventually destroying the dignity and social well-being of vulnerable populations and the countries meant to be developed (ibid).

The formation of business centers in Johannesburg or HITEC city in Hyderabad has created new job opportunities and stimulated economic growth in the cities. In both cases, the government has contributed a great number of initiatives, such as new legislation, regulations, executive orders, court decisions, and funding to support the world cities' projects. In Johannesburg, there are several new laws and regulations at national and provincial government levels shaping the GDS objectives. Likewise, a city development plan in Hyderabad is being developed in line with JNNURM's objectives and shaped by the government of India, through the Ministry of Urban Development as well as the state government of Andhra Pradesh. The world-city initiatives clearly acknowledge that economic benefits should be shared by the creation of more equitable and spatially integrated cities but, as we could see in both examples, these ambitions have not been achieved (*See* Article III).

It is evident that in the process of making world-cities the national entities are reconfigured to implement policies required for a global corporate economy (Brenner, 1998, Brenner and Theodore, 2002). This reconfiguration entails a partial, typically highly specialized and specific, denationalization of particular components of the national (Sassen, 2003). The institutional arrangements encouraged in the GDS or JNNURM schemes clearly promote decentralization in water service delivery in accordance with the corporate rules of the game, but, as we saw in our examples (*See* Article I and II), they have not led to achievement of the social goals in terms of uplifting the conditions for the disadvantaged. While this reconfiguration has been pervasive across the countries in both cases, Johannesburg and Hyderabad, as flagships of world-cities, have been increasingly central in neoliberal policy

[7] The term *Creative Destruction* was coined by Joseph Schumpeter (1942), derived from Marx's earlier work, to describe the way in which capitalist economic development destroys and reconfigures previous economic orders, to create new ones (Cowen and Shenton, 1996). By rejecting Marx's approach to socialism through fundamental change in the class structure and a change in the mode of production, Schumpeter makes no distinction between directing and directed labour (Bourgeoisie, Proletariat in Marxist terminology), and therefore for him, the development of capitalism cannot be explained by the course of exploitation whereby the capital is formed and accumulated (ibid). Schumpeter postulates development as a process driven by the entrepreneur, under the supervisor of development (i.e. the heroic bank), mediating the process in which new techniques and new combinations of techniques of production arose out of the destruction of the old (ibid). Harvey uses the term in line with the original Marxian usage.

reforms and institutional innovations. These innovations have been established through urban renewal policy and a broad range of organizational reforms. While the local politics and policies are reconfigured by the wish for cities to be globally competitive, the calls for equality are overridden as the urban decision-making making processes follow the imperatives of neoliberal capitalism. As a result, the long-standing challenge of addressing inequality remains.

Corporatization model – a strategic shift

At the landscape level and in relation to the water sector, the main actor is the World Bank that for decades has often been the largest source of finance in low-income countries (Bakker, 2010). In the mid-2000s, the World Bank came to the realization that involvement of the private sector in urban service delivery is neither profitable nor possible, practical or desirable in low and middle income countries (WB, 2011). Therefore, in a turnaround in 2005, the World Bank acknowledged that the majority of water systems should remain publicly owned and function as corporatization models (ibid).

Given increasing costs of water provision and insufficient government and state grants, however, municipalities are required to make up for the deficit through international/external financing. Such loans are often given based on sector reforms and the adoption of certain policies to secure the debt repayment. Consequently, public sector organizations have been under pressure to reform their methods of service delivery and especially service payment systems. Often, these reforms are coincident with the rise of neoliberal policy and are expressed in terms of new public management, translated, where organizational restructuring is deemed necessary, into corporation models (Bakker and Cameron, 2005).

The water sector reforms in Johannesburg and Hyderabad have involved transferring assets, liabilities, staff and the ongoing business of water utilities into state-owned corporations like JW and HMWSSB. In the corporate models of water service delivery, water that is provided as a public service in these cities also becomes a source of revenue. JW and HMWSSB are therefore required to operate in accordance with business principles, presumably to increase autonomy and efficiency in water service delivery. The translation of this thinking into action is seen in the adoption of cost-recovery mechanisms by JW and HMWSSB. The underlying rationale of cost-recovery is to reduce water waste and to improve water infrastructure and services to world-class standards.

As illustrated in the attached articles, in practice, however, when the water utilities impose cost-recovery mechanisms, the urban poor often suffer from reduced water access. Given the high level of water loss (over 30% in both cases) in low-income

areas, the unit water price becomes higher than the price in rich areas with improved and efficient pipe networks (*See* Article I and II). Hence, low-income households pay a higher percentage of their income to get access to water (which is relatively expensive per drop), and cannot afford services of the same quality as those provided in high-income areas.

As argued by Bakker (2010), as the result of this landscape pressure, governments (as the main regime actor in our cases) often restrict the water services to wealthy elites for various reasons, such as fiscal constraints, lack of managerial capacity and clientlism. These strategies and patterns, particularly where they entail spatial variation, might imply an intensification of neoliberalization. In other words, the government agencies at different levels, which in principle should represent the interests of *all* citizens, are less able to act on the basis of politically-determined priorities. Instead, their decision-making is based increasingly on a corporate model whereby services are provided to those able to pay and, thus, quality of service becomes a function of ability to pay rather than need.

Therefore, one could argue that the stark disparity of access to water services presented here is influenced heavily by governance practices. This may go some way toward explaining why inequality in water access is so persistent and ubiquitous as a phenomenon.

Niche encapsulation

In addition to the above social, political and institutional aspects of urban water regimes, which contribute to reproducing inequality in water access, the technological and managerial aspects of water provision play essential roles. In both cases (*See* Article II and III), the common approach of water management is based on long-distance water transfers to the city and distributing it there by means of pipes and tankers, with at least one-third of the water lost during delivery. By comparison, other possible technological innovations in relation to water allocation and distribution to/in the city, such as relying on local water resources and rainwater harvesting approaches, have not received much attention from the water regime.

Rainwater harvesting could be seen as a technological niche experiment according to transition management. The potential of rainwater harvesting, even in semi-arid areas such as Hyderabad (with an annual rainfall level of 700-850 mm), is high (Narain, 2006). Further, India has a long tradition of rainwater harvesting systems both in urban and rural areas of most arid regions of the country (Kumar, 2004, Narain, 2006). In investigating the future water supply strategies for Hyderabad, George et al. (2009) show that under normal conditions in Hyderabad, 80,000 liters of water can be generated from a 100 square meter roof area per annum. This can

potentially meet 35 percent of the domestic demands in a year, since 40 million cubic meters can be collected from the roofs of buildings and stored in rainwater tanks[8] (George et al., 2009).

Nevertheless, water policy and reforms have paid little attention to rainwater harvesting techniques compared to other water supply and delivery methods, due to pressure from real estate lobbies on the one hand, and the lack of governmental incentives on the other hand (Chakrabarti, 2001, Kumar, 2004, Narain, 2006). Rainwater harvesting is an optional (not mandatory) reform under the urban renewal plans in Hyderabad, and the government has withdrawn the 50 percent subsidy on structures related to the Hyderabad rainwater harvesting initiative, known as Neeru-Meeru, Water and You (HMWSSB, 2008, JNNURM, 2011). In the absence of adequate resources and political will the ability of urban local bodies to upgrade infrastructure and services has been limited and, in reality, the 74th Amendment has not given much authority and resources to the local government and civil society to promote investment in other appropriate technologies in the water service delivery sector (Chakrabarti, 2001).

Having pointed out a potential technological alternative and the reluctance of the regime to adopt it, the crucial aspect here is to draw attention to the social and political settings under which niche experiments are selected, promoted and controlled. For example, in the Phiri case, prepaid water meters were chosen and used as innovative technologies for demand management as JW would argue. But as we could see, these technologies have become tools of control employed by the regime actors to limit water access of the marginalized. Even if the rainwater harvesting techniques are demonstrated to be successful in niche applications and to hold a potential for scale-up, it is nevertheless questionable whether disadvantaged people would be able to argue the case for the approach and reap benefits from it unless they are themselves fully engaged as partners in water management processes. This takes us to the importance of local politics on the ground, which is discussed in the next chapters.

[8] With an estimated 500,000 households (composed of four persons with consumption rate of 50 liter per person per day) in Hyderabad by 2031 (assuming an uptake of 20,000 household per year adopting this technology)

A reflection on analyses

By applying the analytical framework developed in Chapter II to the case studies of urban water regimes it has been possible in this chapter to explore some of the mechanisms leading to inequality in water access. The attached research articles aim to highlight the importance of power dynamics in analyses of regimes (*See* Article I), expanding the definition of regimes beyond the socio-technological sphere (*See* Article II) and highlighting the impact of landscape on urban water regimes (*See* Article III). By illustrating the interplay between landscape, regimes and niche, we are able to explore how the characteristics of urban water regimes are shaped and how disparities, in terms of the access to water, are created, perpetuated and can become 'locked-in'.

There remain, nevertheless some crucial aspects that require further elaboration in order to understand the enduring structure underpinning these perpetuating mechanisms. First, there is the importance of the geo-historical contexts of each case, shaping the political dynamics in each city. For example, one could argue that as much as the landscape factors have been influential in shaping the attributes of urban water regimes, the political dynamics have played an equally important role in provision of water services. This concerns political dynamics between the local, regional and central governments, as well as between different political parties and the relationships between government at all levels and citizens. This point is tightly linked to a related concern over the second, underplaying the role of agency in reproducing urban water regimes, which has not been given full attention in the hierarchical and structural approaches of transition analyses.

Therefore, on the basis of the shortcomings and limitations of the analyses that became apparent while applying the framework to the case studies, the next chapter seeks to develop a richer understanding of possible causes of persistent inequality in access to water.

IV. Going beyond the locked-in regimes

Using the transition framework, integrated with critical urban theory, helped us in postulating mechanisms that could potentially explain the observed phenomenon of ubiquitous and persistent inequality in water access in cities of the global South, as presented in Chapter III. This explanation of mechanisms can broadly be categorized as a structuralist account, in which inequality is seen to be driven by a combination of the economic and political apparatus of neoliberal capitalism. As noted by several scholars, in structuralist analyses, there is less room for investigating the local variations of political dynamics between the government and citizens in a given context (Heller and Evans, 2010). The risk here is thus that we may overlook geo-historical conditions and context-specific factors that might lead to the formation of institutions and social relations, strategically crafted over time by individuals or groups, for their ongoing values revolving around non-economic factors such as caste, race, gender, etc. The importance of understanding the social and political interplay of actors at the local level was particularly highlighted when looking at the potential of technological niche experiments, such as rainwater harvesting techniques. We could see that, in the absence of active citizenship in terms of the political engagement of the marginalized in the process of decision-making over the control of water services, the niche experiments and their outcomes might easily be either ignored or co-opted by the regime, thereby further entrenching inequalities in water access for the disadvantaged urban dwellers.

Having these points in mind, this chapter aims to bring to the fore a *relational perspective* of the local social and political conditions of each case, which is not often the focus of analysis in structuralist approaches used to explore inequality in access to water. Therefore, in the next sections, first, a relational perspective on durable inequality is delineated, in order to uncover important factors that were missed out in the analytical framework developed earlier. Second, the political and social settings of each case are analyzed and explained through the lens of this perspective. The material used for this analysis is based on a review of a wealth of available literature on the history of social and political conditions of the case-study cities and their respective countries. At the end of this section, the analytical framework is revisited with a focus on developing the niche level analyses.

A relational view on inequality

Drawing on the origins of durable inequality, Tilly (1998) posits that social inequalities persist because dominant groups and organizations have an interest in employing categorical distinctions to reproduce their privileges and maintain unequal relations. The instances of such organizations are firms, associations, lineages, states, parties, churches, and similar well-established institutions (ibid). He argues that most forms of inequality are shaped by the organizations around binary categories, such as male/female, black/white, or around hierarchically bounded categories, such as class and caste. According to Tilly's relational explanation of inequality, social relations across binary or hierarchical boundaries produce exploitation between categories or opportunity hoarding of resources by the dominant category.

Exploitation is understood as a process in which powerful connected people have control over resources and enlist the efforts of others in value production while excluding them from the full value added through means, such as legislation, work rules, and outright repression. For example, South African gold mines long depended heavily on black labor, but black miners were paid barely enough to survive (Tilly, 2001). Opportunity hoarding is a process in which members of a categorically- bounded network acquire a monopoly of a valuable and renewable resource and create practices and beliefs to sustain network control of the resources. The case of white South Africans who obtained privileged access to skilled jobs in mining and in industry is one example (ibid).

According to Tilly, states can also serve as sites and instruments of exploitation and opportunity hoarding. He continues that every government sustains a polity, a set of relations among actors who have routine, low-cost access to governmental relations, and collectively they exercise control over government resources (Tilly, 1998). By applying Tilly's relational perspective in the global South context, Heller and Evans (2010) demonstrate that durable inequalities in South Africa and India, not only reproduce caste, class, race, and gender differences through routinized practices of networking, socializing, consuming, and sharing information, but also instrumentalize institutions and governance in general to serve those interests (Heller and Evans, 2010).

Given this explanation of inequality, the relational analysis not only complements structuralist explanations by paying more attention to the local politics, but also refutes another rival explanation, which Tilly frames as a competitive explanation of inequality. According to the proponents of this view, the origins of inequality lie in sorting mechanisms (e.g. the market and institutions) that channel individuals to different positions (e.g. jobs, public offices, dwellings, prestige categories) that are

unequally rewarded (Tilly, 2001). In competitive explanations, inequality is perceived as the result of sorting unequally endowed individuals into unequal positions because of the imperfect market, bad policies and irrationalities (ibid). Accordingly, with good policy and market settings or with changes and enhancement in individual skills and responsibilities, the inequality can be resolved. In criticizing this view, Tilly posits that processes of exploitation and opportunity hoarding operate more effectively and at lower cost in conjunction with categorical inequality. Hence, inequality is firmly associated with various forms of group discrimination in which the 'privileged' transplant the social relations from the earlier established organizational models to other settings.

While the relational analysis of inequality is fundamentally different from the competitive explanation, it complements the structuralist explanation by paying more attention to the contextual conditions, including political dynamics between the city and the central governments as well as local variations in democratization and citizenship (Heller and Evans, 2010).

Similar to Tilly's relational analysis, Mahoney (2000) highlights the notion of *path-dependency* to examine how the set of actions and strategies faced in the present is limited or constrained by past events that sometimes have consequences lasting long beyond the lifetime of the event itself. Through a power explanation of path-dependency, among others[9], Mahoney postulates that an institution may initially empower a certain group at the expense of other groups and that the advantaged group uses its additional power to expand the institution further in a continuous, self-reinforcing and self-sustaining cycle. Because early events are contingent, this sequence of empowerment can take place even though the group that benefits from the institution may initially have been subordinate to other groups that favored adopting a different institution.

Viewing durable inequality from the above perspective, leads us to scrutinize the political interplay between the government and citizens in two of the most democratic political systems in the global South. This becomes even more interesting to investigate if we consider that citizens of our case-study cities are constitutionally provided with different platforms, forums and rights to raise their

[9] In reinforcing sequences, the reproduction of institutions can be explained based on the rational cost-benefit assessments of actors (utilitarian explanation), the functions that they serve for an overall system (functional explanation), the support of an elite group of actors (power explanation), and/or finally based on actors' beliefs in the appropriateness of institutions (legitimating explanation). Each of these explanations strives to demonstrate the process in which early events trigger subsequent development by reproducing a given pattern. For more details, *See* Mahoney (2000).

voice and demands, to the governments that are "democratically" elected, which might not be the case in many other countries and cities in the global South. The following sections only touch upon the government and citizenship relation to show the importance of the relational perspective in understanding the roots of inequality in access to civic services.

Citizens – governmental agents relations

Conditions in South Africa

In the case of South Africa, the shift in political power from the White dominant apartheid regime to a democratically-elected government has fundamentally expanded the citizenship in relation to national polity (Heller and Evans (2010). In the water domain, for example, South African water legislation received a radical overhaul when the National Water Act came into effect in 1998. This Act challenged the values of the past by framing water resources management within the context of three fundamental principles: sustainability, equity and efficiency (Pollard et al., 2009). The Act required catchment management agencies (CMAs) to be established by the minister of water and environmental affairs, delegating water resources management to the regional or catchment level and involving local communities within the framework of the national water resource strategy (DWA, 2012). The CMAs were therefore supposed to play a critical role in managing the country's scarce water resources, including by facilitating stakeholders' input into the management of water resources (e.g. local surrounding communities, industry, municipality, etc.). However, when it comes to the actual impact of the Act in terms of effective devolution of power in the democratic decentralization process, the progress and promises of legislation have been hindered.

At the regional level, for example, the delegation of water management functions to the catchment level has been only partially implemented. As of March 2012, the minister decided to reduce the number of CMAs to nine from the original proposal of 19 CMAs (DWA, 2012). Reasons given include the technical capacity required to staff CMAs and the challenges such a large number of institutions poses to the Department of Water Affairs (DWA) in regulating their performance (ibid). Several research studies point out that capacity problems limiting the effective participation of provincial and local government in CMAs are connected with the style of centralized and bureaucratic government planning of the previous administration (Dent, 2005). Few resources were provided historically to provincial and local government and the expansion of four provinces into nine through the new

Constitution resulted in a vacuum of finances, technical skills and leadership abilities in each of the new provinces.

At the city level, the post-apartheid government strove to address the challenge of inequality in city planning and decision-making processes by establishing community development fora (CDF) especially in townships based on the Reconstruction and Development Programme (RDP):

> Generally, the democratic government must support capacity-building in the District Councils, Local Councils, and voluntary community structures such as local development forums. To advise communities of their options, it must train a cadre of Community Development Officers. Their training must include sensitivity to gender issues. The Community Development Officers must work for the District Councils. Wherever possible, they must come from the areas they serve (RDP 4.3.13).

Hence, CDF were supposed to be arenas where the voice of historically disadvantaged groups could be raised and heard, particularly in relation to housing and civic services. In practice, however, the vision of embracing mobilization of citizens though a range of participatory institutions is far behind the reality of the majority of the black urban poor who still have limited options to access water services (Nastar and Ramasar, 2012). The ANC as the main organization that liberated the oppressed majority from apartheid has sought to maintain its legitimacy in terms of its transformation agenda, regardless of whether or not citizens have determined this agenda (Sinwell, 2011).

Against the earlier ambitions and promises, the prevailing centralizing logic of the ANC has insulated decision-making processes and local government is seen as an instrument of delivery rather than as a forum for decision-making and development-planning (Heller and Evans, 2010, Nastar and Ramasar, 2012, Sinwell, 2010b, Sinwell, 2010a). Therefore, participatory platforms, such as ward committees and CDF have been dismantled or hollowed out and mass-based civil society organizations, such as township civics, have been marginalized or co-opted (Heller and Evans, 2010, Sinwell, 2010b, Sinwell, 2010a). In Johannesburg, for example, the City of Johannesburg and the Alexandra Renewal Project drive community development and local residents are less cohesive as a community (Nastar and Ramasar, 2012, Sinwell, 2010a). The identification of Alexandra for the renewal project and the decision to subsidize water in the area was made by the central government and not by any direct intervention from the local residents (Sinwell, 2010b). At present, the government seems prepared to subsidize the cost of water to Alexandra but if financial resources are reduced or diverted elsewhere many households in Alexandra will be unable to pay for water and will lose access (ibid). Under such circumstances, many residents of Alexandra are compelled to accept a standard of water services prescribed by the local government even if they are not satisfied with it. They may feel that some tapped water is better than nothing, but

the level of service is not comparable to that provided to former white, colored and Indian areas. This seems to have made local actors dependent on the authorities with little exercise of power themselves (Nastar and Ramasar, 2012).

The Phiri water-right case in Soweto is another example of a flawed participatory process, where the main participants in stakeholder meetings and a majority of households were not consulted at all about the pre-paid meters (Barnes, 2009). Residents who were in arrears with their payments had a weak bargaining position to resist the installation of the meters (Desai and Pithouse, 2004). They were, in fact, informed that the only way to receive their free basic water allowance and to have their debt written off, was through pre-paid meters, while the normal credit meters (promoted in the rest of Johannesburg) or the diverse subsidized options available in Alexandra were not offered as viable alternatives (Ruiters, 2007). Following this process, pre-paid meters were installed, and the inability to pay has become a threat to accessing water (Dugard, 2010).

The relation between Alexandra/Soweto communities and government officials at the city level as well as the failure of CMAs at the regional level, all show that the channels of participation have been limited to little more than symbolic spaces rather than being fora for meaningful engagement with the authority in decision-making processes. Therefore, almost two decades after the demise of the apartheid regime, the practices of citizenship lag behind the vision and plan at the metropolitan level. The ANC government's approach to participation actually restricts citizens' ability to influence development (Nastar and Ramasar, 2012, Sinwell, 2010b, Sinwell, 2010a, Heller and Evans, 2010). As Schensul and Heller (2011) point out:

> The categorical inequalities of apartheid, deeply inscribed as they are into the socio-spatial hierarchy of the city, continue to do their work, dramatically limiting the social and economic opportunities of the black urban poor...the spatial hierarchy of the apartheid city remains intact (though transformed by the upward mobility of a small African bourgeoisie favored by state policies) and access to education, health services, transport, and formal housing remain massively skewed (Schensul and Heller, 2011).

For Tilly, this does not come as a surprise. Through what he calls de-democratization, he argues that the surge of reversion toward authoritarianism from a formerly democratized regime occurs when trust networks proliferate from public politics and their proliferation reduces citizens' incentives to collaborate in the democratic process. This, in turn, weakens protections for the bulk of the citizenry and increases the opportunities of the rich and powerful to intervene selectively in public politics in their own interest. Therefore, in the relation between the government and citizenship, the ANC-led government acts here as the opportunity hoarders causing negative changes in trust networks, constraints in political

participation and, eventually, distance from the goals of democracy in addressing durable inequalities.

Conditions in India

The Constitution of India, adopted in 1950, proclaimed India as a sovereign federal democratic republic (Sharma, 2002). In addressing inequality prior to independence (achieved in 1947), the constitution outlaws the traditional Indian system of social stratification based on caste (ibid). It prohibits discrimination on the grounds of religion, language, race, ethnic background, sex or place of birth and it includes the right of minorities to establish and administer their own educational institutions and to conserve a distinct language, script and culture (ibid). The vision and ambition that people should be equal in terms of their relation with government, and that minorities and historically disadvantaged groups should be protected from arbitrary state action, is what Tilly would view as a democratization process. In this sense, India's democratic norms and institutions are, indeed, impressive. But Tilly also notes that democratization and de-democratization are continuous processes, with no guarantees that either will be long sustained. In fact, he argues that in many cases, de-democratization occurs more rapidly than do democratization processes. In the case of India, this reversal process can be traced through the changing relationship between the opportunity hoarders and excluded groups.

The Indian constitution did indeed make an effort to embrace the operation of the state at the local level, through the institutional changes instituted by the 74th CCA with a view to creating a democratic and decentralized governance framework. However, political and bureaucratic resistance at the provincial state level has blocked effective devolution of power (Kennedy and Zérah, 2008, Shatkin, 2013, Heller and Evans, 2010, Chatterjee, 2004, Sharma, 2002). In Andhra Pradesh, and in most states, the executive authority over urban development has historically rested with municipal commissioners, who are Indian Administrative Service (IAS) civil servants appointed by state governments, while elected mayors have been largely powerless (GHMC, 2011, Kennedy and Zérah, 2008, Shatkin, 2013). Officers of the IAS are often elites drawn from the affluent and educated upper castes (Sharma, 2002). Therefore, critical decisions about infrastructure, housing, economic development and other matters of municipal governance are in the hands of state governments, and Indian cities have limited governance authority and autonomy (Kennedy and Zérah, 2008, Shatkin, 2013, Heller and Evans, 2010, Chatterjee, 2004, Sharma, 2002).

The process of decision-making and planning for the city and its citizens becomes even more complex once we consider the clash of political interests, which often center on categorically bounded networks, e.g. castes and religions, as Tilly would

remind us. The state of Andhra Pradesh (AP) comprises three regions: Telangana, Coastal Andhra and Rayalaseema (Janardhan and Raghavendra, 2013). Since the formation of AP, in 1965, the Congress Party has been the dominant party in the state politics. As the single political party after Indian independence, the Congress Party gave states significant power in India's federal system. In the early 1980s, however, the power of the Congress Party started to decline, mainly as a result of internal splits, the demise of intra-party democracy, the populist campaign style of its leaders (e.g. Mrs Gandhi), and its inability to accommodate the demands of lower castes (Chaplin, 2011). The weakening of the Congress gave rise to the emergence of the Telegu Desam Party (TDP)[10] in Andhra Pradesh, which won the election on the basis of an appeal to the Telugu pride – the self-respect of the Telugus (Suri, 2004). The TDP articulated its goals in terms of the protection and promotion of the interests, culture and honor of the regions, which the national parties ignored or suppressed, or to which they remained indifferent (ibid). The creation of Cyberabad in 1998 was a symbolic showcase for the TDP aimed at popularizing the party image by promising to turn the improvised, remote, rural place of Hyderabad into India's new IT hub, after Bangalore (Das, 2012). In doing so, the TDP had the support of lower castes and the Kammas caste, one of the most politically dominant castes in the state [11](Das, 2012, Kamat, 2011, Pingle, 2011).

By 1999, caste-based voting had become the fact of AP politics: survey data showed that 87% of Kammas and 62% of the "Peasant Other Backward Castes" in AP voted for the TDP while 77% of the Reddys, 64% of the scheduled castes and 60% of Muslims voted for the Congress (Suri 2002). In other words, while the Congress has some of the Reddys support and the TDP has some of the Kammas' support, the parties largely reflect the interests of the dominant castes that control their fortunes (Pingle, 2011). In 2004 the re-emergence of the Telangana movement demanding the creation of a new state of Telangana from AP affected the TDP's position in the political equation between the AP and the central government (Pingle, 2011, Das, 2012). The Congress had backed the movement as a way of enticing the Telangana voters away from the TDP. This political move has worked and the Congress Party took over the state affairs once again. It maintains control to the present time (ibid).

[10] Desam literally means country

[11] In the state of Andhra Pradesh, there are two politically dominant communities, the Reddys and Kammas (Pingle, 2011). The Reddys are maily dominant in Telangana and Rayalaseema. The Kamma are traditionally dominant in the Coastal Zone. "It is the control of the Reddys and Kammas over agrarian resources such as land and water that has been the most important source of their economic and political power. In the post-Independence period, and especially following the Green Revolution due to the wealth it generated, they expanded their activities into other spheres of the economy, i.e. business, transport, contracts and industry" (ibid). Also, *See* Upadhya (1997).

Given the political tension between the Congress party and TDP the decision-making processes at the city level have been self-serving, and cities have served as places for accumulating sources of rent and vote-banks for state-level politicians (Janardhan and Raghavendra, 2013, Pingle, 2011, Kamat, 2011). For example, Das (2012) points out that during TDP's rule (1995-2004) the Congress party was strongly opposed to the acquisition of lands from poor villagers without provision of compensation to villagers in the Cyberabad region. But when they returned to power in the state in 2004-05 (to the present), their promises to provide land/compensation to the poor were never honored (Das, 2012).

In these circumstances, politics in India became more personalized and therefore encouraged opportunistic politicians to mobilize dissatisfied groups with unrealistic promises or offers to deliver short-term partisan benefits (Chaplin, 2011). With the incapacity of the local government, most of the participatory platforms promoted during city development plans therefore become platforms to strengthen the ruling party at the local level rather than platforms for citizen engagement in the process of policy-making. The categorical inequalities, riven with corruption, nepotism and the legacies of caste and class bias, therefore remain intact (Heller and Evans, 2010). As several studies point out, urban politics in Indian cities have been dominated by clientelistic politics, middle class hegemony, and extra-local power for much of the post-Independence period (Chatterjee, 2004, Chaplin, 2011, Shatkin, 2013).

What can be done?

The political interplay of actors at the local levels indicates that so-called "democratic" and "participatory" channels and platforms offered by the governments in these cities have not necessarily been an arena where the disadvantaged actively participate in decision-making processes about their needs and the means of delivering them. As illustrated above, decisions on city developments plans are often made in conformity with the interests of the rich, powerful and influential actors who take advantage of differences revolving around bounded categories in achieving their goals, which is hardly improving the life conditions for the urban poor. The conditions in these cities are a reflection and manifestation of power abuse and of power corrupting politicians and representatives who use power in their own self-interest or the interests of their categorical groups rather than those of the electorate in general. The net result is that the situation seems impervious to change through the ballot box.

Even if we assume, on a best-case scenario, that local governments are elected without any bias in favor of a particular bounded category, central governments

have their own centralized and pre-determined plans that are heavily influenced by market-driven mechanisms, as we saw in chapters II and III. Under these conditions, it becomes very unlikely that local governments will gain a high degree of autonomy in terms of acting independently irrespective of the financial and political climate in which they function. Whoever has the power of decision is therefore increasingly constrained to operate on principles of neoliberalism even though they may be serving the interests of a particular political party, caste, or any other bounded categories. Thus, what we are dealing with here is a durable structure of inequalities supported not only by historical bounded categories, but also by strong forces of global capitalism.

Given the conditions above, what can be done? How can such strong structures of inequality be tackled on the basis of a limited agency constrained by existing social relations? The question becomes even more challenging if we consider that the resources available to unprivileged groups in these cities are very limited.

From a perspective of critical urban theory, as explained in Chapter II, it is suggested that the contradictions of capitalism in increasing social polarizations will ultimately break out revolutions that change the underlying forces of inequality. Nevertheless, neither in South Africa nor in India, do we face a 'revolutionary situation'[12]. The neoliberal city development plans to turn parts of these cities into world-class districts have made other parts into a "planet of slums" and, thereby, have entrenched the privileged positions of some while leaving the disadvantaged with minimum resources for decades now.

From a transition perspective, explained in Chapters II and III, we could speculate that innovative niche experiments that involve changing or complementing the traditional long-distance water provision by, for example, developing locally-based rainwater harvesting, might have the potential to improve water access among disadvantaged groups. But towards the end of Chapter III, we also saw that the success of utilizing such niche experiments for the urban poor can be achieved only if the communities have a part to play in discussing the implications of transitioning towards using local water resources, or in other words, have a role in controlling the modes of water service delivery.

[12] Tilly (2009) states "a full revolution combines two elements: a revolutionary situation and a revolutionary outcome. In a revolutionary situation, at least two centers of power emerge, each of them commanding significant coercive force and each of them claiming exclusive control over the state. In a revolutionary outcome, a transfer of power over the state occurs such that a largely new group of people begins to rule."

From a relational perspective, as advanced in this chapter, it becomes apparent that citizenship practices, in terms of active political engagement in decision-making processes and in negotiating demands, are unlikely to come about through the available governmental channels that are so often influenced and biased towards bounded categories.

Reflecting on these insights, one might conclude that structural changes are most likely to come from the bottom up, and not from within the systems but originating externally. In line with these perspectives, critical realists would remind us that enduring structures driving urban water regimes can be transformed through emergence of collective agents. This agency can emerge only from our relations with our environment and from reflection upon internal and materially grounded conversations, conducted within a collective process and in interaction with other agents. Implementation of Archer's philosophical statement about how to bring about social changes begs questions such as who are these collective agents, where are they, how do they emerge, and can examples of such agents and their active roles in societal transition toward more just water provision be found in our case studies? These questions are taken up in the next chapter.

V. The agents of change

As shown in Chapters III and IV, unequal water access in the cities of the global South is associated not only with the narrative of world cities and with corporatization of urban water institutions, but is also an outcome of the politics of privilege exerted at the local levels (albeit differently in different contexts). In our case examples, the metropolises are disempowered as social and political arenas. In turn, this undercuts the ability of the poor to exercise their rights to the city and to urban services, rights that have been either obstructed (in the case of Johannesburg) or not recognized (in the case of Hyderabad). In Johannesburg, the dominance of the ANC and its use of increasingly technocratic modes of governance have constrained many forms of citizen participation in decision-making processes. In Hyderabad, there are even less meaningful points of interface with the state compared to Johannesburg to the extent that the mode of intermediation is often through party-based patronage.

In altering the relations between citizens and governmental agents as well as in broadening political participation, Tilly (2003) argues that enhancing collective control over governmental resources and actions is a necessity. In sketching the characteristics of such collective agency, he draws attention to *contentious performances*, in which participants in contention innovate new ways of claim-makings that are often drawn from "learned and historically grounded" experiences (Tilly, 2008). For example, citizens tend to march against their governments and anti-globalists protest against meetings of transnational organizations. By these acts, citizens engage in *contentious politics* bringing together three features of social life: contention, collective action and politics. Contention comprises claim-making processes that bear on someone else's interests (including agents of governments) and range from timid requests to strident demands and to direct attacks. Tilly defines collective actions as coordinated efforts on behalf of shared interests or programs, which often occur with no significant contention or government involvement. When we interact with agents of governments, we enter the realm of politics ranging from simple daily routines to elections or to referendums. In short, contentious politics "involves interactions in which actors make claims bearing on someone else's interests, in which governments appear either as targets, initiators of claims, or third parties" (Tilly, 2008). Contentious politics matters because it involves collective learning and incessant adaptation. Participants learn how to perform individual actions like marching and how to differentiate the interactions from each other, such

as separating "us" from "them" (ibid). They also become knowledgeable about strategic logics of making collective claims as well as how to play their own parts and modify performances in the light of their effects (ibid). Figure 5 shows the elements of contentious politics and how it can potentially lead to altering the relations between those hoarding opportunities and those who are excluded or, in other words, between exploiters and exploited.

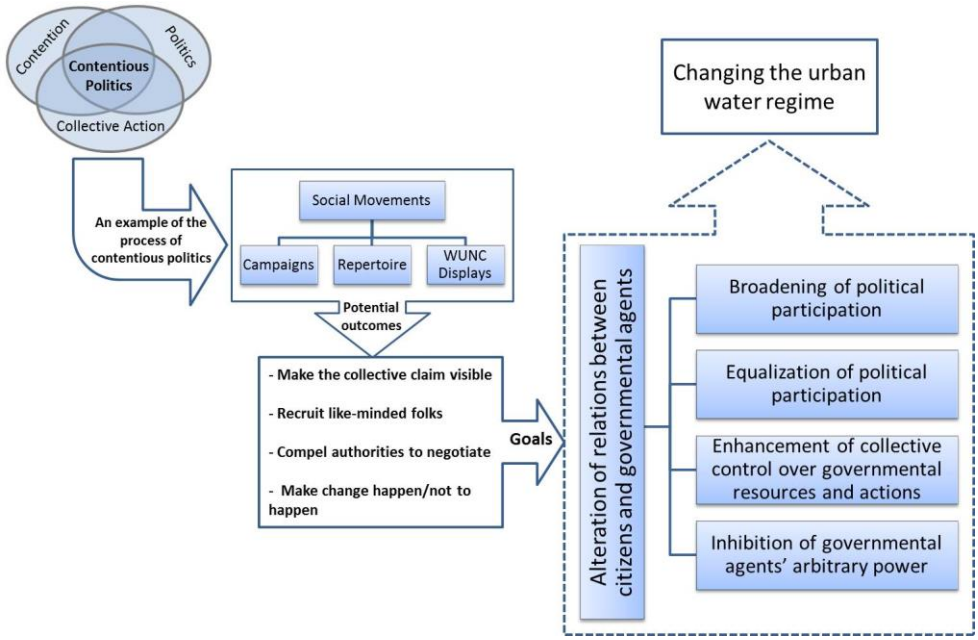

Figure 5. The elements of the contentious performances.
Adopted from Tilly (1998, 2005, 2004, 2008).

As shown in Figure 5, social movements constitute a distinctive form of contentious politics. By analyzing a wide range of historical cases of contentious politics and performances, Tilly delineates three main elements of social movements: campaigns, repertoire, and so-called 'WUNC' displays i.e. **W**orthiness, **U**nity, **N**umbers and **C**ommitments (Tilly, 2004). Campaigns entail a sustained and organized public effort in making collective claims on target authorities. Repertoire comprises employment of combinations from among several forms of political action: the creation of special-purpose associations and coalitions, public meetings, solemn processions, vigils, rallies, demonstrations, petition drives, statements to and in public media, and pamphleteering, etc. WUNC displays are public representations, by the participants concerned, of worthiness, unity, numbers and commitments on the part of themselves and/or their constituencies. Tilly explains that, to be effective, campaigns should extend beyond a one-time declaration. Hence, the day-to-day organization of campaigns involves a vital moving back and

forth between public claim making and other activities that sustain a campaign. The social movement repertoire overlaps with repertoires of other political phenomena, such as trade union activities. Finally, WUNC displays may take the form of statements, slogans or labels that imply worthiness, unity, numbers and commitment.

Examples of collective agency

An example of social movements in relation to the problem of inequality in access to services is the "right to the city" movement. The idea was first proposed by Henri Lefebvre in the late 1960s and was taken up by other critical urban theorists scholars (Brenner et al., 2011). Under the umbrella of the slogan "right to the city" there are different campaigns (i.e anti welfare cuts, pro rights for migrants, etc.) as well as efforts to draft transnational covenants for just, democratic and sustainable cities (Brenner et al., 2011). Mayer (2011) makes a distinction between different movements and initiatives invoking the notion of the "right to the city".

The first notion of the "right to the city", she argues, is co-opted by the World Bank, WTO and UN-Habitat, in which organizations and policy networks work to create a more stable institutional footing for the implementation of specific rights in the current city as it exists (Mayer In Brenner et al., 2011). The risk for social movement organizations, in adopting national and transnational charters concerning human rights, such as access to shelter, access to safe water, etc., policies advocating the creative city, world-class cities, and so on, is that they become integrated into a neoliberal urban model, as is evident in our cases. As Rapley (2008) argues, the World Bank has realized that development that does not improve the lives of poor people will only provoke resistance and crisis (Rapley, 2008). Following the rationale of avoiding resistance and crisis, individuals have once again become the center of development studies and of pro-poor policies by the World Bank. The idea of participation is evident in almost every water project but with a fundamentally different agenda and idea concerning what is the 'right' to water and to the city.

This brings us to the second approach to the right to city, which differs fundamentally from the first one in the sense that urban movements and organizations are struggling for the right to another city, not to the city as it exists. Mayer (2011) highlights the Lefebvrian concept of transformation of society where groups threatened by mega urban projects use this motto to create rights through social and political actions in cities (Mayer In Brenner et al., 2011). In this sense, organizers use the motto to build coalitions within and between housing activists and artists, leftist groups and cultural workers, small shop-owners and various groups who feel threatened by investor-driven upgrading and transformation of the

city by means of renewal projects. Mayer claims that: "such processes of exchange and cooperation are likely to become even more important in the future" (Mayer in Brenner et al., 2011).

In Johannesburg, the Socio-Economic Rights Institute of South Africa, Anti Privatisation Forum, Soweto Electricity Crisis Committee and other groups of political activists can be viewed as constituting collective agents in creating a momentum together with Phiri residents in opposition against pre-paid meters. It took active promotion of these networks through mass meetings over several years to stimulate new ways of resource mobilization. This case has relevance for conflicts over service delivery in many other places in South Africa. Whether a transformative power will emerge from them and, if so, whether they will succeed in breaking-down the constitutive power of the existing regime, depends on future acts by frontrunners. According to Dugard, it is too soon to judge the result of proactive litigation by the Anti Privatisation Forum, but initial feedback suggests that social mobilization has neither been deterred nor discouraged (Dugard, 2010).

In Alexandra, the collective agents, such as non-governmental organizations, community based-organizations, e.g., Wynberg Concerned Residents as niche actors and the Alexandra Renewal Project as one of the main regime actors, could potentially initiate social mobilization in relation to transition in water service delivery. In the history of Alexandra, such frontrunner organizations have effected change during the apartheid struggle. They played a central part in safeguarding the continued existence of the township during a period when the National Party apartheid government destroyed many townships and carried out forced removals. A frontrunner organization at the time was the Alexandra Liaison Committee headed by Dr Sam Buti who led a protest against forced removals and was able to "save Alexandra from extinction" (Mafenya, 2002). Such locally-based community organizations have been powerful frontrunners in the past and could be so in the future. There is thus a role for social mobilization as a potential agent of change in water governance in South Africa (Kolb, 2007). This is in line with work by Pithouse (2008), which shows that shack dwellers constitute a major challenge to technocratic conceptions of democracy (Pithouse, 2008).

Likewise, the history of Andhra Pradesh and Hyderabad is enriched with struggles – dalits, tribal and women's social movements – for civil, political and economic rights to address the concerns of the people, especially the most vulnerable (CESS, 2007). As Sunita Narain states:

> The movements of small groups of people fighting for survival are real, intensifying and becoming more strident. In a democracy, there will be some listening. Many of these protests – against land acquisition, water takeover, mining, dams, power projects or pollution – are getting some measure of official response. This is not to say that every protest will be successful. Far from it. But it is also a fact that these

> movements represent voices that are asking for different ways of development. These movements stand for rights to land, water, forest and mineral resources. And, as I have written before, these movements are collectively teaching us that we will have to build different pathways for economic growth that is inclusive and sustainable (Narain, 2012).

Whether or not these movements in Indian or South African cities can move the urban political regime in the direction of "broad, equal, categorical, binding consultation and protection" (Figure 5) remains an open question. But movements for urban inclusion are increasingly tenacious and likely to be a persistent force in shaping the disadvantaged groups' demands in the cities of the global South. Thus, practicing citizenship rights, outside the arenas provided by the government, through contentious performances becomes the essential key to contest control of opportunities and resources held by the governments. Tilly (2005) elegantly describes this process as follow:

> In the course of democratization, the bulk of a government's subject population acquires binding, protected, relatively equal claims on a government's agents, activities and resources. In a related process, categorical inequality declines in those areas of social life that either constitute or immediately support participation in public politics. Finally, a significant shift occurs in the locus of interpersonal networks on which people rely when undertaking risky long-term enterprises such as marriage, long-distance trade, membership in crafts, and investment of savings; such networks move from evasion of governmental detection and control to involvement of government agents and presumption that such agents will meet their long-term commitments. Only where the three sets of changes intersect does effective, durable democracy emerge (Tilly, 2005).

In taking these strategies to the water domain in cities of the global South, one could argue that protests and resistance to corporatization of the water service delivery under the campaigns of "right to the city" or "cities for people, not for profit" (Brenner et al., 2011) and so forth, can potentially lead to coalitions of different social groups. If during the course of struggles, these groups learn to acknowledge and recognize their caste, race, gender, religious differences, there is a decline in categorical inequality leading to the construction of a trust network, which in turn, can make the collective governance of water services a possibility. This includes a mode of governance where citizens are "makers and shapers" instead of "users and choosers" (Cornwall & Gaventa, 2000), and are actively engaged in the process of decision-making over municipal budget allocation, payment schemes and discussing viable (socially sustainable) technologies of water resources and delivery.

If the collective agency as such emerges, we may expect the unsustainable characteristics of urban water regimes that reproduce inequality to be tackled and the unequal water access to be addressed. As Nelson Mandela would remind us:

"It always seems impossible until it's done."

How long the process of collective-claim making and, most importantly, of collective learning continue and to what extent these movements can go beyond the categorical differences, we do not know. But if we go back to Archer's philosophical postulation of change, it is only during the course of interactions with our environment, and here over struggles, that our internal conversations change and *persons* become *agents*.

VI. Conclusions

This research was prompted by stark disparities in the terms of access to water in the cities of in Johannesburg and Hyderabad, as well as in other cities of the Global South, and by the observation that such disparities appear to be persistent and pervasive. It analyzed urban water regimes in both cities, where decisions about water allocation and distribution are made, and plans are implemented. The multi-level perspective framework in transition studies was integrated with insights from critical urban theory. The resultant analytical framework was designed to capture different factors and actors contributing to unequal water access and, hence, to highlight the unsustainable characteristics of urban water regimes in Johannesburg and Hyderabad. The framework applied to these cases revealed a number of driving forces behind persistent and pervasive inequality in water access.

The investor-driven upgrading of cities, promoted through the narrative of becoming a world city, has turned these cities into sites of accumulation of wealth among the financial and political elite. The creation of business districts in Johannesburg and luxurious residential neighborhoods of HITEC city in Hyderabad, have generated jobs, both in the formal and the informal service economy, but only a few can afford the world-class services. The cost of land and living conditions in the gentrified neighborhoods have driven low-income groups to slums, where inferior services are offered. This is evidenced in Johannesburg, where the people of Phiri are dissatisfied with the verdict of the constitutional court in 2009, which limits their access to water by approving the installation of prepaid water meters. The residents of Alexandra, even in formal settlements, are troubled by interrupted water access, when there is often no running water in the installed water pipes. In Hyderabad, slum dwellers in Jagadgirigutta, Fathenagar, and Begumpet, often have access to water only on alternate days, and for just a few hours at a time.

The commercialization of the civic services through the world-class narrative has not significantly improved the living conditions of the urban poor in Johannesburg and Hyderabad. Arguably, in some instances it has even lessened the access to basic services for disadvantaged groups. International financial institutions (e.g. the World Bank, the IMF and Asian Development Banks) and global management consulting firms (e.g. McKinsey & Company) have had a crucial role in the promotion of the world class narrative. First, they have influenced governments to adopt macro-economic development frameworks that support the

commercialization of municipal services in cities. Second, they provide financial and technical support, which is often conditional upon the enforcement of cost-recovery mechanisms.

This interplay of landscape and regime, in turn, has affected communities and niche experiments in two ways. First, participatory platforms, such as community forums, have been disempowered by technocrats and political elites, and consequently they have not been effective arenas in which to raise the voices and demands of the urban poor. Second, technological innovations that can be used locally for water supply and reuse (e.g. rainwater harvesting and grey-water systems) have not been promoted or supported.

The developed theoretical framework was useful in articulating the impact of the global economic structure in reinforcing inequality. However, it also had its shortcomings, which became apparent when the framework was applied to the empirical cases. These included the lack of focus on context specific and political factors as well as an unclear explanation of agency-structure interplay in changing urban water regimes.

In addressing this, Tilly's relational explanation of durable inequality was integrated with the earlier analyses. This emphasized the importance of the geo-historical context, especially in shaping the relationship between governments and citizens. It was shown how the governments of both South Africa and India have served as sites and instruments of exploitation and opportunity hoarding. Despite the promises of democratization and inclusive political participation in both cases, historically subordinate groups remain disempowered. This is due to a number of factors, revolving around bounded categories like, race, caste, and class. In Johannesburg, the dominance of the current ruling party and the use of increasingly technocratic modes of government have precluded many forms of political participation. In Hyderabad, there is less meaningful interaction between the state and the citizens, compared to Johannesburg, in so far as the mode of intermediation is often through party-based patronage.

Tilly's relational explanation was not only a source of insight in understanding the ubiquitous and persistent nature of inequality, but also helped to outline a set of strategies that might assist in addressing the problem. In the light of these insights, the notion of social movements, and the elements of contentious politics (contention, collective action and politics) were highlighted to generate change. A crucial factor in explaining how social movements can emerge is the movement's relation to previous historical struggles associated with bounded categories. This means that in order to make collective-claims in decision-making processes, for example over municipal budget allocation and monitoring, the coalitions among disadvantaged groups should include a whole set of differences in race, caste, tribe,

religion, gender, but at the same time understand the unity that potentially exists within all that difference.

This takes us to a second element in explaining how social movements can emerge, the role of political entrepreneurs. Contentious performances could not survive without political entrepreneurs, who know how to organize meetings, bring out masses of supporters, and draft public statements given the contextual settings of each slum, shack settlement or any other district of the city. The Socio-Economic Rights Institute of South Africa, the Anti-Privatization Forum, the Soweto Electricity Crisis Committee and other groups of political activists may be regarded as examples of such political entrepreneurs.

Finally, we can speculate that the strong repertories and collective contentions occur incrementally in the course of struggles, where participants learn whole interactive performances such as street marches. Perhaps Tilly's theatrical metaphor best illustrates the point:

> Claim making usually resemble jazz and commedia dell'arte rather than ritual reading of scripture. Like a jazz trio or an improvising theater group, people who participate in contentious politics normally have several pieces they can play, but not an infinity. Within that limited array, the players choose which pieces they will perform here and now, in what order (Tilly, 2008).

Hence, in shaping contentious performance we need to practice constantly and reflect upon the strengths and weaknesses of struggles. For example, in the Phiri case, the strength and limitations of rights-based approaches become more evident. As an example, the contentious politics exercised by the community enabled the voices of Phiri citizens to be heard throughout the country, affecting the broader struggle in South Africa against the commodification of service delivery.

Once they emerged, the social movements revolving around service delivery and the right to the city have, hypothetically, the potential to address inequality, and thus, affect billions of people who reside in slums, shacks and informal settlements around the world. This is where Mike Davis, in his book, Planet of Slums, puts his hope: in the emergence of grassroots (or, as Davis puts it, a new informal proletariat in slum areas) issuing a compelling demand for the right to the city, after a decade of structural adjustment (Davis, 2007).

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The analysis presented up to this point, however, falls short of outlining a blueprint for making collective claims. In other words, it neither articulates the opportunities for social mobilization, nor explains how the necessary associations and coalitions can be created. This indeed paves the way for further research, where the rise and fall of social movements in Johannesburg, Hyderabad and other cities can be

studied, and translated into an effective practice to tackle problems of inequality in access to water. By departing from the theme of water access and inequality, the following sections conclude by exploring the implications of this research for transition studies and sustainability science.

Politicizing the transition perspective

In transition studies, the multi-level perspective framework is typically applied to investigate historical cases of regime transformation, or to analyze contemporary regimes and the elements that hinder a transition towards a sustainable future in a given domain, such as energy, water, transport, etc. In most cases, analyses have been focused on the role of technology, by considering the social and institutional settings. This thesis suggests that we should start by envisioning a sustainable social future, e.g., an equitable water provision, and then bring the role of technology into the analysis, especially in the contemporary context of cities of the global South. This requires an in-depth investigation of the "socio" part of "socio-technological" systems, in order to capture and analyze persistent problems, including inequality in access to water.

In doing so, critical realist insights can be helpful. Based on the ontological underpinning of this research, the analyses went beyond the observable phenomenon of unequal water access. The thesis demonstrated that the interlocking nature of rigidities of regimes goes beyond apparent socio-technological characteristics, to the mechanisms and conditions that can be understood in actual and real domains of reality, as shown in Figure 6.

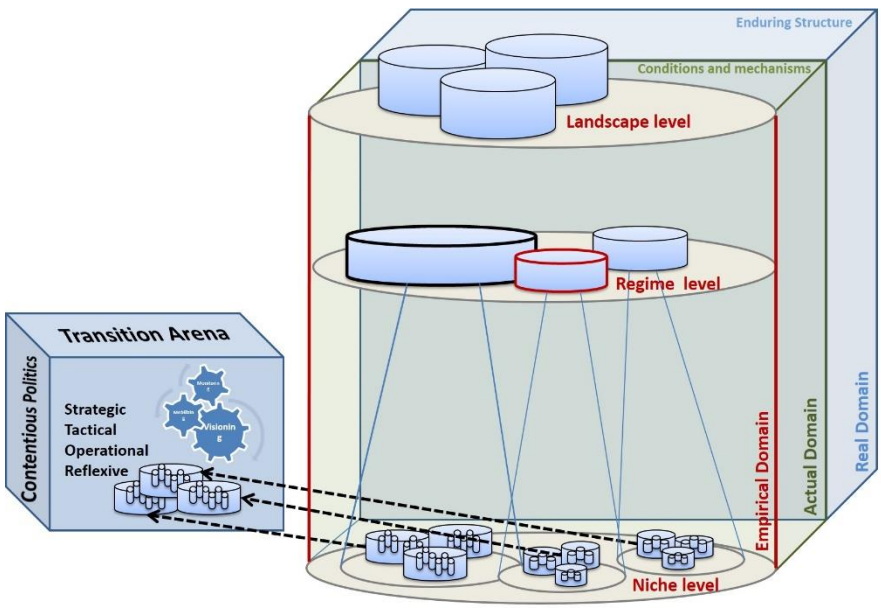

Figure 6. Incorporation of the dynamics of mechanisms, conditions and contentious politics into the transition framework

Entering the actual domain leads us to study the mechanisms and conditions that produce observable landscape pressures, urban water regimes, and niche experiments. The real domain draws our attention to enduring geo-historical elements affecting the mechanisms and conditions in the actual domain. Although our knowledge of these enduring structures is imperfect, it is only during the processes of making and testing our knowledge, that we can understand the observable events more profoundly. By viewing levels of analysis in transition studies at different depths of reality, the following suggestions are made for studying the landscape and niche levels.

Landscape: More than an external context

In the historical analyses, landscape is often treated as an external context that is substantially independent of changes at the regime and niche levels. Climate change, wars, economic crises and political ideas are examples of such external factors driving regimes, but they are out of the reach of actors at the regime and niche levels. The utilization of the landscape level only as an operating environment, which is almost impossible to change, can undermine the notion of agency, and the possibility that change is within the power of regime and niche actors.

In contemporary analyses, such as the one carried out in this study, the landscape can be treated less passively, if we attribute factors at this level to actors with agency, which can be changed. The neoliberal development ideology behind the commercialization of cities and services, for example, is instigated and run by powerful international organizations and corporations, at the global level. Undoubtedly, making changes in the structure and architecture of the World Bank, IMF or Mackinsey & Co might be a slow process, but nevertheless, such organizations are subject to change. The strategic move of the World Bank from privatization to the corporatization of service delivery, resulting from its recognition of citizen resistance and protests against the privatization of water service delivery in several cases around the world, is one example that illustrates how landscape factors *can* be changed through the influence of niche actors or in some cases, regime actors (Goldman, 2005). This is in line with the ontological assumption in critical realism that posits that the properties of a structure are separated from the properties of agents, but that they can be changed, once collective agency emerges. (Archer and Bhaskar, 1998).

Socio-political niche: Contentious politics in transition arenas

In the context of rapid urbanization in the global South, it is important to analyze the potential of innovative niche experiments to quench the urban thirst. This thesis, however, has argued that innovations should not only be understood in the realm of technology, but should be analyzed also from social and political perspectives.

Socio-technological niches are experiments, such as R&D laboratories, or subsidized demonstration projects, where users have special demands and are willing to support emerging innovations (Geels, 2011). There are two crucial points here: first, from a technological perspective, niches should be novel and have the potential to be scaled up and transferred, in order to challenge and ultimately replace the dominant technological practices of the incumbent regime, such as long-distance water transfer schemes. Second, from a social perspective, niche experiments should be affordable and viable for the communities in which they are put into practice, including slum areas. This requires particular economic and social settings (e.g. subsidies, social transfer payments, or the redistribution of employment or other opportunities to generate income). These points are crucial, because they are in distinction to similar arguments, notably those postulated by ecological modernization theorists (Orsato and Clegg, 2005).

The underlying assumption of ecological modernization is that technological advances are the key elements in addressing environmental issues like water scarcity (ibid). In the most simplified version, ecological modernization theorists posit that "human ingenuity will be able to harmonize economic advancement with environmental improvements" through technological advances and without much change in governmental or market structure (Orsato and Clegg, 2005). Therefore, the proponents of such a view might promote a technological solution, like pre-paid meter technology, as used in Soweto. But, as discussed, the pre-paid water meters have not only disempowered the Phiri community in terms of access to water, but have also been used by regime actors as an instrument of control.

In contradiction to the above line of argument, this thesis has argued that potential and sustainable socio-technological niches cannot be scaled up without substantial changes in water and urban policies, and in development ideas at the landscape level driving urban water regimes. This has brought us to the notion of socio-political niches, which are less studied in transition thinking. As discussed in the earlier chapters, the effectiveness of socio-technological niche experiments in boosting water access is tightly linked with the role of socio-political niches, which provide a protected arena in which creative and innovative ideas can flourish, and which can put pressure on regimes. These socio-political niches, including social movements, can be conceptualized as contentious performances, and as a class of

communication that evolves through incremental transformation in use, as Tilly would enlighten us.

From a transition framework perspective, 'right to the city' movements can be conceptualized as socio-political niches, where political front-runners become agents of change in the transition processes. They are "niche players" and "change-inclined regime players", with the "capacity to generate emergent structures within deviant structures" in transition arenas (Rotmans and Loorbach, 2009). The transition arena should be viewed as an experimental space, in which actors can use and reflect upon the outcomes of each experiment in order to acquire knowledge that can lead to a new perspective on a transition issue. This experimental space also allows actors to become better equipped to exercise power against the locked-in regime. If we think of transition arenas as a means of creating narratives and agendas to influence policies, then critical debates, resistance, disobedience and political conflict become essential elements for bringing about change.

This calls for further research and elaboration on the conceptualization of socio-political niches and their linkage to socio-technological experiments at the micro level as well as their interaction with other levels of analyses in the transition framework.

Going beyond wicked problems

The approach of politicizing the transition perspective offers a coherent attempt in the field of sustainability science to understand persistent social and environmental challenges. This attempt was made using the issue of inequality in water access in the global South. The developed analytical framework engaged with several cross-cutting themes, such as inequality, urbanization, and the politics of city development, in order to analyze water scarcity as an issue of inequality in water access rather than as an issue and challenge of physical scarcity per se.

By doing so, the research goes beyond the "wickedness" of problems like water scarcity, climate change, land-use change, and biodiversity loss, which are sometimes deemed impossible to tackle. So-called wicked problems are considered *to be too difficult* to formulate because they comprise multiple components and have a systemic aspect such that no single discipline or field of study is able to offer full understanding or is able to promote systemic solutions. The problem of water inequality is not wicked in itself; instead, the assumed wickedness is the result of a *too narrow understanding*. Approaching these problems from an interdisciplinary perspective, however, enables us to integrate multiple theoretical understandings of such problems and see them differently. From a sustainability science perspective, we can conceptualize and formulate varied drivers causing a complex problem like inequality in water access and, consequently, we can promote systematic resolutions.

In this sense, a critical realist approach is part of the appropriate philosophy of science for analysis of sustainability challenges. On the one hand, it acknowledges that the issue of water scarcity goes beyond the observable facts. On the other hand, the approach recognizes the real and materialistic elements that drive the problem. In essence, critical realism balances out the philosophical worldviews between constructivism and positivism, which are often associated with critical thinking and problem-solving approaches. It is therefore a suitable approach for analyzing persistent and ubiquitous sustainability challenges, as explained throughout the research presented. Integrating critical theories on the origins of inequality into the multi-level perspective framework of transition studies, was a step towards bridging the critical thinking traditions of knowledge production, and problem-solving approaches. The ontological and epistemological considerations of critical realism were used to go systematically through layers of reality that lie behind inequality of water access, and to propose an interdisciplinary formulation of driving forces. These, in turn, can be used to outline potential resolutions.

In order to study the events and the underlying mechanisms, conditions and enduring structures comprehensively, familiarity with a number of theories and

concepts from different disciplines is required. In other words, the use of a critical realist epistemology becomes more meaningful and insightful if one employs several theories to explain a given problem. In this sense, the approach employed can shed light on the aspects of problems that a disciplinary approach would overlook.

However, the research outcomes might compromise the depth of analysis, or limit the insights from each school of thought. For example, there is an ongoing theoretical debate about the conceptualization of agency and structure, world city formations, and the provision of water services. Each of these strands of science may take several years of research and engagement with debates. Therefore, this is not to argue against the production of in-depth knowledge about how a society functions, how politics shifts, how cities grow, or how much water is available for use. However, we also need to produce integrated knowledge that connects these different analyses together. This is one of the main overarching ambitions of sustainability science, and this research should thus be seen as supporting this ambition by developing and testing methods for more integrated analyses that can deliver new insights into how to address persistent and ubiquitous problems more effectively.

VII. References

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VIII. Appendix

This section provides an overview of other applied approaches in sustainability science and their relevance to the present research. As stated in the introduction, either of these approaches could have been used as basis on which to develop an analytical framework to study the urban water regimes from a particular angle. Since the focus of this research is inequality in access to water, a subject that is inherently a social and political issue, the utilization of these frameworks was, for the reasons explained below, considered less relevant in comparison to the transition framework and critical urban theory.

Drivers-Pressure-State-Impact-Response (DPSIR) framework

One of the most common analytical frameworks used in the context of sustainability to analyze the causal chain that links human activities to environmental issues and societal responses to their impacts is DPSIR (Edith and Rob, 1999). Introduced by the European Environment Agency (EEA) in 1999, DPSIR (Figure 7) is used to integrate knowledge and information from social and natural sciences to develop an overview of environmental problems as well as to identify policy options and appropriate management responses (Edith and Rob, 1999, Ness et al., 2010).

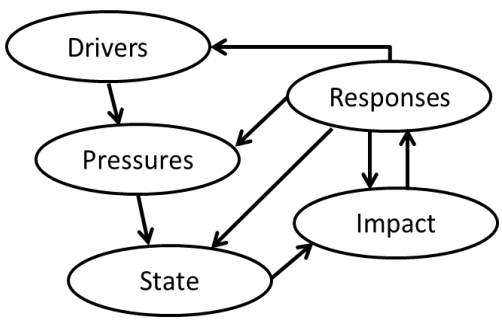

Figure 7. The DPSIR Framework for Reporting on Environmental Issues
(Edith and Rob, 1999)

'Drivers' are often considered to be socio-ecological forces, e.g. climate change, population growth, economic structures, imposed by government, industry or other actors. 'Pressures' indicate the consequence of the driving forces on environment or

society. The ‘state’ of the social and environmental pressures results in ‘impacts’ that cause ‘responses’ from policy-makers like new policies and regulations. The Global Environment Outlook (GEO), a series of reports on the environment issued by UNEP, as well as the Millennium Ecosystem Assessment, use DPSIR as the analytical tool in the assessment process (UNEP, 2007). In another example and in the water domain, the framework is used in the context of adaptive management of river basins to provide policy-makers and practitioners with a better understanding of the relationship between human activities and ecosystems (Pahl-Wostl, 2007). The framework is, however, criticized for its limitations in capturing the social and political dimensions of responses at different scales (Ness et al., 2010, Carr et al., 2007). In addition, the strong emphasis on quantifying social and environmental impacts through a set of indicators gives less room for in-depth qualitative analysis of responses and driving forces. These characteristics have limited the application of DPSIR mainly to policy-making and natural-resource management areas. Hence, what I take from DPSIR is a methodological contribution in terms of systematic and holistic thinking to broaden our knowledge about complex sustainability issues and to identify potential entry points to address them. The footprint of such system thinking can be seen in other analytical frameworks that came after DPSIR, as follows.

Social -ecological systems (SES) framework

Similar to the DPSIR approach in unfolding the dynamic of coupled social and ecological processes, the resilience concept and framework became popular among scientists after the formation of the Resilience Alliance in 1999 (Janssen et al., 2006). Originally introduced by Holling in 1973, the concept of resilience was used to determine the persistence of relationships within a system and to measure the ability of these systems to absorb disturbances like fires, flooding, windstorms, and so on (ibid). The ultimate goal of these analyses is to offer insights that can help policy-makers to increase the adaptiveness of natural resource management and thus to prevent harmful changes in the ecosystem, e.g. groundwater depletion (Folke et al., 2002).groundwater depletion (Folke et al., 2002). While acknowledging the importance of the resilience concept, Ostrom et al. (2007) challenges the presumption that scholars can make simple, predictive models of social-ecological systems.

In her attempt to move beyond panaceas (i.e. one big resolution that fits all different problems), Ostrom (2009a) presents SES framework as a diagnostic tool to identify clear questions in analyzing linked SESs, and as a crucial step in building an interdisciplinary science of complex and multilevel systems. The objectives of the SES framework is to provide a common set of potentially relevant variables and their subcomponents to be used in: a) the design of data collection instruments b)

the conduct of fieldwork and c) the analysis of findings about the sustainability of complex SESs (*See* Ostrom et al. (2007) and Ostrom (2009a)). Figure 8 shows the components of the SES framework and how they are linked together.

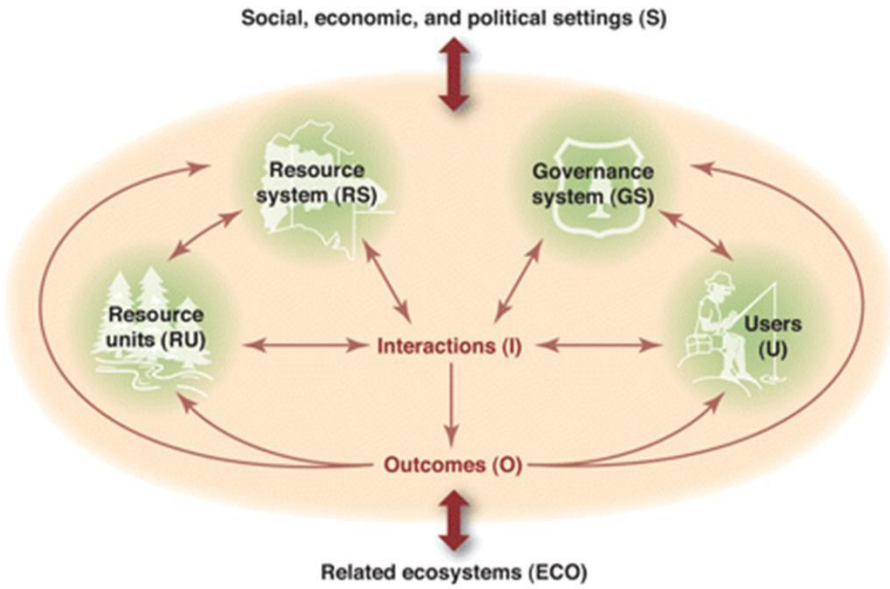

Figure 8. Social and ecological systems
(Ostrom, 2009)

Revolving around the importance of institutional arrangements, (Ostrom, 2009a) conceptualizes the natural resources as common pool resources, CPRs, e.g. water resources, fisheries, hunting areas or forests. Building upon a great number of empirical cases (more than 47 irrigation systems, 44 fisheries, 100 forests in different countries) and experimental laboratories, Ostrom argues that the users' engagement in sustaining CPR is not necessarily linked with coercive and external factors (i.e. central government intervention or market forces). She highlights the role of reputation, trust, reciprocity and cheap-talks in increasing the likelihood of self-organizations. She contends that the possibility of self-governance increases once the expected benefits of managing a resource exceed the perceived costs of investing time and energy in designing and implementing governance systems (Ostrom, 2009a, Ostrom, 2009b).

The idea of self-governance is here tightly linked with non-cooperative game theories in which it is assumed that, through collaboration and learning processes, rational actors anticipate negative and positive consequences of their actions in the future, and hence, adjust their actions in the present. The classic example of such circumstances is illustrated through 'prisoner's dilemma' game and the resolutions, *cf:* (Ostrom, 2009b).

The application of the SES framework to analyze CPR arrangements might be useful in a small geographical context with well-defined boundaries, low levels of mobility (of resource units and users) and a high degree of social capital, but its usefulness in both classifying and analyzing heterogeneous, diverse and complex urban settings is questioned by several studies (Bakker, 2008). Also, the new-institutionalist underpinnings of the framework puts little emphasis on the political interests involved in the process of collaboration, non-local contextual factor as well as structural forces in which 'rules of the game' are being 'crafted' and affected (ibid).

Nevertheless, in relation to analyses of urban water regimes, there is a valuable point here: the idea of constructing 'solidarity-fostering governance' can throw light on disturbing public-private dualism models for managing water resources and the delivery of services (Bakker, 2008). In other words, what I take from here is a theoretical contribution in terms of postulating that alternative community economies and non-capitalist management mechanisms are feasible once the power imbalance is addressed. Alternative forms of water management institutions and organizational structures can subvert and transcend conventional dualities, for example, by involving actors prioritizing policies that simultaneously improve social equity while improving efficiency. These proposals have much, therefore, to recommend them (ibid).

Political ecology

Centering on incorporating political insights to analyses in sustainability science, different approaches in political ecology aim to politicize uneven social processes occurring in the environment of cities and their impacts (Forsyth, 2003, Robbins, 2012). According to Robbins (2012), political ecological narratives share a common premise that environmental change and ecological conditions are the product of political process (Robbins, 2012). As a result of this political process some people win and some lose. Research in the field of political ecology is concerned with questions of who is losing and who is wining, what are the power relations at play, and what are the environmental implications of this process (ibid). Although there has been an ongoing debate in political ecology about how much nature or society should be put into analyses of cases (Paulson et al., 2003, Walker, 2005), there is a common consensus, at least among the majority of human geographers, that nature and society are inseparable (Swyngedouw, 2006, Swyngedouw, 1999). Robbins (2012) makes a typology of the four dominant approaches in political ecology as shown in Table 4.

Table 4. The dominant narratives of political ecology

Thesis	What is explained?	Relevance?
Degradation and Marginalization	Environmental change: why and how?	Land degradation, long blamed on marginal people, is put in its larger political and economic context
Environmental conflict	Environmental access: who and why?	Environmental conflicts are shown to be part of larger (gendered, classed, and raced) struggles and vice versa
Conservation and control	Conservation failures and political/economic exclusion: why and how?	Usually viewed as benign, efforts at environmental conservation are shown to have pernicious effects, and sometimes fail as a result
Environmental identity and social movement	Social upheaval: who, where, and how?	Political and social struggles are shown to be linked to basic issues of livelihood and environmental protection

Source: (Robbins, 2012)

It can be safely argued that political ecology analyses focus on critiques of (among others) capitalism and the neoliberal regime of political economy in relation to sustainability concerns and development consequences (intended and un-intended) within and between generations.

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