

# Newcastle University e-prints

---

**Date deposited:** 20 January 2010

**Version of file:** Author final

**Peer Review Status:** Peer reviewed

## Citation for published item:

Swyngedouw E; Kaika M; Castro JE. [Urban water: a political-ecology perspective](#). *Built Environment* 2002,**28** 2 124-137.

## Further information on publisher website:

<http://www.alexandrinepress.co.uk/>

## Publishers copyright statement:

The definitive version of this article was published by Alexandrine Press, 2002. More information from publisher website - [http://www.alexandrinepress.co.uk/be\\_about\\_built\\_environment.php](http://www.alexandrinepress.co.uk/be_about_built_environment.php)

---

## Use Policy:

The full-text may be used and/or reproduced and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not for profit purposes provided that:

- A full bibliographic reference is made to the original source
- A link is made to the metadata record in DRO
- The full text is not change in any way.

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

**Robinson Library, University of Newcastle upon Tyne, Newcastle upon Tyne.  
NE1 7RU. Tel. 0191 222 6000**

## **Urban Water: A political-ecology perspective**

**E. Swyngedouw, M. Kaïka and E. Castro**

School of Geography and the Environment, Oxford University, UK

Mansfield Road, Oxford OX1 3TB, UK

e-mail:

erik.swyngedouw@geog.ox.ac.uk;maria.kaika@geog.ox.ac.uk;esteban.castro@social\_studies.ox.ac.uk

Published in Built Environment, (ISSN 0263-7960), Special Issue on Water Management in Urban Areas, 2002, Vol. 28, #2, pp. 124-137.

## **Introduction**

The paper is divided into four parts. In the first part, we shall summarise the main components of a political-ecological perspective, with particular reference to questions of urban socio-environmental sustainability. The central themes of a political-ecological rendition of the urban process and of the urban water cycle will be outlined. In a second part, the critical moments with respect to the contemporary organisation, management, and dynamics of the urban water cycle will be explored, with particular reference to the findings of the case studies. In a third part, the relevance of these dynamics with respect to the question of sustainability will be explored, while the final part will tease out some conclusions with respect to urban sustainability.

## **1. Political-Ecological Perspectives on Urbanisation**

### **1.1. Urbanising Political-Ecology**

Over the past few years and in the wake of the resurgence of the environmental question on the political agenda, a growing body of work has emerged on either the environmental implications of urban change or on issues related to urban sustainability (Haugthon and Hunter, 1994; Satterthwaite, 1999). In many, if not all, of these cases, the environment is defined in terms of a set of ecological criteria pertaining to the ‘natural’ milieu. Both urban sustainability as well as the environmental impacts of the urban process are primarily understood in terms of physical or biological environmental conditions and characteristics. Political-ecological perspectives start from a radically different position (Benton, 1996; Braun and Castree, 1998; Burgess, et al., 1997; Keil, 2000; O’Connor, 1998; Peet and Watts, 1996; Ward, 1997; Swyngedouw, 1999). Although highly variegated, political-ecological approaches share some common characteristics:

1. Environmental and social changes co-determine each other (Norgaard, 1994). Processes of socio-environmental change transform both social and physical environments and produce social and physical milieus with new and distinct qualities. In other words, environments are combined socio-physical constructions that are actively and historically produced, both in terms of social content and physical-environmental qualities (Escobar; 2001; Latour, 1993; 1999).
2. There is nothing a-priory unnatural about produced environments like cities, dammed rivers, or irrigated fields (Harvey, 1996). Produced environments are specific historical results of socio-environmental processes.
3. The type and character of physical and environmental change, and the resulting environmental conditions are not independent from the specific historical social, cultural, political, or economic conditions and the institutions that accompany them (Swyngedouw 1997; 1999).
4. All socio-spatial processes are invariably also predicated upon the transformation or metabolism of physical, chemical, or biological components (Swyngedouw, 1996).
5. These metabolisms produce a series of both enabling and disabling social and environmental conditions. Indeed, these produced milieus often embody contradictory tendencies. While environmental (both social and physical) qualities may be enhanced in some places and for some people, they often lead to a deterioration of social and physical conditions and qualities elsewhere (Peet and Watts, 1993; Keil and Graham, 1998; Laituri and Kirby, 1994).
6. Processes of socio-environmental change are, therefore, never socially or ecologically neutral. This results in conditions under which particular trajectories of socio-environmental change undermine the stability or coherence of some social groups or places, while the sustainability of social groups and places elsewhere might be enhanced. In sum, the political-ecological examination of the urbanization process reveals the inherently contradictory nature of the process of socio-environmental change and teases out the inevitable conflicts (or the displacements there-off) that infuse socio-environmental change.

7. Particular attention, therefore, is paid to social power relations (whether material or discursive, economic, political, and/or cultural) through which socio-environmental processes take place. It is these power geometries and the social actors carrying them that ultimately decide who will have access to or control over, and who will be excluded from access to or control over, resources or other components of the environment. These power geometries, in turn, shape the particular social and political configurations and the environments in which we live.
8. Questions of socio-environmental sustainability become hereby fundamentally political questions. Political-ecology attempts to tease out who gains from and who pays for, who benefits from and who suffers (and in what ways) from particular processes of socio-environmental change. It also seeks answers to questions about what or who needs to be sustained and how this can be maintained or achieved.
9. Political-ecological perspectives seek to unravel the nature of the social relationships that unfold between individuals and social groups and how these, in turn, are mediated by and structured through processes of ecological change (Cutter, 1995). In other words, environmental transformation is not independent from class, gender, ethnic, or other power struggles.
10. It also seeks to question the actual processes of environmental re-construction and re-casting and advocates a position on sustainability that is achieved by means of a democratically controlled and organised process of socio-environmental (re)-construction. The political program, then, of political-ecology is to enhance the democratic content of socio-environmental construction by means of identifying the strategies through which a more equitable distribution of social power and a more inclusive mode of environmental production can be achieved.

## **1.2. The Political-Ecology of Water and the Urban Process**

It is, of course, commonplace to argue that the urbanisation process is predicated

upon a myriad of socio-ecological transformations that affect the geographies of places both nearby and far away (Cronon, 1991; Hundley, 1992; Gottlieb and Fitzsimmons, 1991). To the extent that the urban process continues, a more intense process of socio-environmental transformation is required in order to ‘sustain’ the dynamics of contemporary urban change. In the process, of course, new environments -- varying from concrete urban landscapes to new eco-systems (for example, around water reservoirs) – are formed. The urbanization process, in sum, presents itself as a historically specific accumulation of socio-environmental processes as well as the arena through which these transformations take place.

Although the particular geographical and institutional configurations vary significantly from city to city and from country to country, depending on the particular combination of physical and institutional factors, the 20th century urbanization process and its accompanying expanding use of water significantly affected the spatial choreography of urban water circulation. For each of the case study cities, and we can safely generalise this argument, the physical-territorial basis on which the successful watering of the city rested expanded as cities grew, both in quantitative as well as in qualitative terms (Hundley, 1992). Either new untapped water reserves had to be incorporated in the urban water cycle or existing water supplies were tapped more intensely. In the case of aquifer water, this led to either a problem of widespread over-pumping that outstripped the natural recharge capacities of aquifers or the urbanization process itself contributed to a gradually decreasing quality of aquifer waters (cases of Tel Aviv, Athens, or London). In the case of surface waters, the falling water quality prompted more sophisticated technological or socio-ecological transformations (Amsterdam) and/or the expansion of the managed capacity of surface water flows, often to a point of full saturation (Tel Aviv, Seville). The geographical expansion of the ecological footprint of urban water not only transformed places and environments far removed from the city, but also intensified conflicts with other users over limited water supplies. In some cases, the limits of the national hydrological capacity have been reached and international solutions sought (as in the case of Israel) or pressures built up to integrate regional river-basin based water management systems into a national grid

system (as in the case of Spain). During the late 20th century, mounting evidence suggested that the sustainability of urban development was bought at the expense of an expanding water frontier and of geographically widening the sphere of impact of the urban water cycle, leading to often unsustainable practices of expanding resource extraction and intensified conflict. In what follows, some of the above arguments will be marshalled to elucidate the central trends that characterise contemporary urban water management systems. The key points of tension, conflict, rupture, and/or potential crisis will be discussed.

## **2. Critical Moments in the Contemporary Urban Water Cycle**

### **2. 1. The Shifting Political-Economy of Water**

#### *The public/private nexus*

Despite the raging debates over potential or actual shifts towards privatisation (a debate that is often couched in terms of an inevitable and necessary adaptation of national policies to the requirements imposed by a new global and de-regulated world economic order), our case-studies show that the long history of changes in the urban water supply sector have, since the inception of urban water systems, always been characterised by shifting configurations of public-private partnerships. Most international studies, including METRON (with the exception of Tel Aviv), demonstrate that the organisation of urban water supply systems can be broadly divided in four stages. The period up to the second half of the 19th century, when most urban water supply systems consisted of relatively small private companies providing parts of the city (usually the richer parts) with water of varying quality. Water provision was highly stratified and water businesses were aimed at generating profits for the investors.

This was followed by a period of municipalisation, primarily prompted by concerns over deteriorating environmental conditions and calls for a sanitised city. In the U.K. – as elsewhere in Europe -- this took the form of a municipal socialism concerned

with providing essential public goods at a basic, often highly subsidised, rate (Laski *et al.*, 1935; Millward, 1991). Profitability was without any doubt a secondary concern and subsidies came from the general tax income (from either the local or the national state). This municipalisation was also supported by local elites whose health and environmental conditions were equally negatively affected by deteriorating sanitary standards in the city. It was during this era that water supply systems were consolidated, leading to a city-wide standardised coverage of domestic water supply, coupled with a comprehensive sewage disposal system (albeit without treatment of sewage waters).

The third phase started approximately after the First World War when the water industry, together with other major utility sectors (such as electricity and telecoms), became part of a growing national concern (Bernstein, 1955; Littlechild, 1986). The national state, with varying degrees of intensity of control, regulation, and investments, undertook a much greater role in public services provision (Parker, 1997). Water infrastructure became -- together with other major infrastructure works and programs -- part of a Fordist-Keynesian State-led social and economic policy. The investments in grand infrastructure works (dams, canals, networks) were part of, on the one hand, an effort to generate and/or support economic growth, while, on the other hand, assuring a relative social peace by means of re-distributive policies (Amin, 1994; Moulaert and Swyngedouw, 1987; Gandy, 1997). Three objectives were central to this Fordist period of expansion of water provision: the creation of jobs, the generation of demand for investment goods from the private sector and, finally, providing basic collective production and consumption goods (like water, education, housing) at a subsidised price for wage workers and industry alike (Herrington and Price, 1987). This can be identified in all our case studies. In some instances, water provision was nationalised (as in the UK and, somewhat belatedly after the dictatorship, in Greece). In other cases, although management remained under the auspices of municipal authorities, the state played an ever-increasing role, particularly in financing infrastructure projects (in Spain and Israel), but also by means of greater regulatory intervention. It was indeed also during this period that a variety of regulatory bodies (for social, economic, quality, or environmental regulation) were established, usually by and at the level of the national state. These

institutional changes also assured that a particular constellation of ‘stake- holders’ would become involved.

During the fourth and most recent phase, roughly starting with the global recession of the 1970s associated with the demise of state-led economic growth and the subsequent transition to post-Fordist or flexible forms of economic development and state guidance, a major shift took place in the public/private interplay in the water sector. First of all, mounting economic problems -- in the context of high social and investment spending – resulted in growing budgetary difficulties for the national (and often also local) state. This necessitated a reconsideration of the direction of state spending and resulted in reduced expenditures in the welfare sector and in supporting debt-ridden industrial sectors or expansive infrastructure programs. The low prices, the subsidised water investments, and the ageing water infrastructure, combined with a still growing water demand, put an even greater pressure on state budgets; a pressure that ran counter to the above processes. Second, the call for greater competitiveness as a means to re-dress the economic crisis of the 1970s and early 1980s prompted a quest for efficiency gains and greater productivity through cutting red-tape, labour-market de-regulation, and greater investment flexibility. This, in turn, was accompanied by privatisation tendencies as a means to pursue both of the above recipe-solutions to the crisis of Fordism. Moreover, the growing globalisation of the economy and the accompanying change in the nature of competition, the greater availability of private capital achieved by means of de-regulation and de-territorialisation of financial markets, and the imposition of strict budget norms (by the EU) further accelerated the shift of the boundary between the public and private sectors in water management more in favour of the latter. Third, the standard democratic channels of government often infused by the presence and active lobbying power of social organisations -- most notably unions – proved to be a considerable barrier for implementing swift policy-changes. The political-economic configuration has, consequently, changed in important ways, resulting in new institutional arrangements (see below) that permit a more business- or market-oriented management that is more in tune with profit-making strategies. Fourth, investors began to search for new frontiers for capital investment. Nature in all its forms (including the production of new genetic

materials) became part and parcel of new accumulation strategies. Water presented itself as a possible new frontier to harness, as a potential source for turning H<sub>2</sub>O into money and profit. Fifth, and finally, the growing environmental problems and, consequently, the proliferating number of actual and potential conflicts in the management and regulation of the water cycle proved to be a serious challenge for traditional forms of organisation and implementation of water-related activities. Particularly in a context in which civil society-based environmental groups became more vocal and powerful, systems of governance had to become more sensitive to these issues. Particularly questions of restricting or controlling demand (demand management) as a strategy to lower water consumption and hence taking away the pressures on expanding the urban water resource base became more loudly heard. The internalisation of all these tensions within a fundamentally state-owned and state-controlled sector like water became increasingly difficult (Swyngedouw, 1998).

The combined effect of the above processes and dynamics resulted in a more or less radical shift (and with varying degrees of intensity in different countries), both in practice and ideologically/discursively, from a state-led and –managed water sector to one that is or has to be more in tune with globalised market forces and with the imperatives of a competitive privatised economy. In some cases, actual privatisation has taken place (such as in the UK), in other cases (such as in Amsterdam or Seville) publicly owned companies are increasingly required to act strategically, managerially, operationally, and organisationally as a private company. In addition, water businesses are now often part of global multi-location companies and/or part of larger, often global, multi-utility conglomerates.

Clearly, the privatisation debate or actual privatisation process has had (and will continue to have) profound implications for the water sector and beyond<sup>1</sup>. Moreover, in a privatised environment (whether still under public ownership or ownership transferred to the private sector), the questions and parameters of what constitutes ‘sustainability’ are radically different from those associated with other forms of management and control.

---

<sup>1</sup> However, we cannot dismiss the existence of powerful forces that oppose the privatising agenda or the internal contradictions of the privatising model, which has often ended in failure in many cases around the world (Savedoff et. al., 1999; Hardoy et. al., 1999; Bond, 1997).

This is the theme we turn to in the next section.

### *Privatising/Commodifying water*

Our case studies reveal, with varying degrees of intensity and levels of implementation, a tendency towards the total commodification of water. In contrast to pre-capitalist and non-Western practices and ‘cultures’ of water (many of whom still linger on and are treasured by their beholders) that experienced water as a ‘public’ and ‘common’ good to which anyone who needed it could have access to at a very minimal, often negligible, cost, recent discursive shifts and political-institutional changes have moved in the direction of transforming water from a good into a commodity (Hassan, 1998). Regardless of the actual institutional form of organisation of the water sector (i.e. private, public, or mixed), the new stage in the commodification of water that started in earnest in the 1980s has by now become almost hegemonic.

In this context, it is important to distinguish between commodification and privatisation. While commodification, on the one hand, refers to turning water from a public good into a marketable commodity subject to the principles governing a market economy (regardless of the nature of the ownership of both water and the water companies) and privatisation, which refers to changing ownership of water infrastructure and/or the management of water services from the public sector to the private sector. In this sense, water services in all our cities have become now largely commodified (or are in the process of doing so). This has been achieved most fully in the cases of Amsterdam and London. Full privatisation has only been implemented in London, while Athens now has a mixed pattern (infrastructure is public, management is private for 49%, a percentage that is set to increase in the near future). In Seville, the municipal water utility is moving in a direction of commodification and full-cost recovery, while the Israeli situation is, of course, more complicated and the state keeps a firm grip on the running of water systems.

### *The demand-supply-investment trialectic in a 'competitive' context*

In a context of commodification and demands for privatisation, the traditional state-led way of managing the triad of demand-supply-investment decisions becomes fundamentally transformed (see also below). If the profit motive, either for public or private companies, becomes the yardstick against which performance is measured (Martin and Parker, 1997) and the price signal a key instrument in regulating the demand/supply nexus, the contradictions between these moments in the economic process take a rather different turn (Littlechild, 1988). In an external context, in which expanding demand is seriously discouraged for environmental reasons, while investment needs to be maintained to replace and update the network, the balance sheet equations for water supply companies become rather specific. With a given demand structure, and with increasing investment, profitability (and hence the sustainability of market-led water companies) can only be maintained via either productivity increases (which are generally capital and technology intensive and almost invariably lead to a rising organic composition of capital and a reduction in the work force) and/or price increases. While the latter is possible, it remains politically sensitive and might lead to socially perverse effects. For example, immediately after privatisation in the UK (1989), the water price increased significantly. Many non-paying households were cut-off (a practice that was later banned by the New Labour government in 1997), while companies and their shareholders gained considerable profits (Herbert *et. al.*, 1995). In the second round of price setting in 1999 (and after the government introduced a wind-fall tax on what were considered to be excessive profits of the privatised utilities), price increases were more modest, immediately resulting in a major reduction of the labour force in the water industry and calls for a partial re-collectivisation of the water infrastructure. In a context of increasing demand and expansion of either total or per capita demand, the volume of profits can be maintained by means of an expansion of supply. In this context, it is interesting to note that the 'productivist' logic of water supply companies continues unabated (despite mounting calls for restricted water use). Furthermore, given the long-

term and capital-intensive nature of investments in water infrastructure, there is a rather weak incentive to engage in major long-term and capital-intensive investment programs. Put simply, there is a clear disincentive to invest in not directly profitable activities like leakage control in contrast to productivity enhancing investments. Finally, in a context of geographically limited supply and demand in which most companies operate, while simultaneously being exposed to a rapidly globalising competitive environment, there is a tendency for privatised water companies to internationalise activities, either by taking over privatised water businesses elsewhere or by means of mergers, acquisitions and/or diversification into other sectors, or by selling their “know-how” overseas.

It is not a surprise, therefore, that the state or other parts of the public sector have to mediate these contradictions. In the UK, for example, Yorkshire Water proposed to collectivise the network part of the water supply system, while keeping the managerial part in private hands, while the Welsh water utility also moved away from private ownership into some mix of public and private management (OFWAT, 2000b, 2000c). In the case of Greece, the preparation for privatisation significantly involved splitting the water company into two parts, a publicly owned company that maintained the assets (technical infrastructure and network) and a privatised (up to 49%) water supply company that would manage the system. It seems that this kind of public-private partnerships, in which the public sector is responsible for long-term fixed capital investments (and much of the cost associated with them) while the private sector organises the profitable part of the system (supply management) is the likely outcome of a privatised water business.

## **2. 2. A new regulatory order?**

### *De-, Re-, or Non-regulation*

The tendency towards commodification and privatisation changes the regulatory context in important ways (see also below). While moves towards commodification and privatisation are legitimated on the basis of considerations of increased competitiveness, higher productivity, lower prices, and drastic cutback of regulatory red tape, there has

been a tendency to equate those shifts in the economic forms of organisation with de-regulation. However, evidence from the water sector from our case studies suggests exactly the opposite. Particularly in the case of the UK, the privatisation of the water utilities in 1989 was accompanied by new institutions, most notably the economic regulatory body OFWAT. Although the main function of OFWAT is the protection of the consumer by means of regulating price-setting and investment, the case study shows that, over time, this process proved to be full of tensions and conflict, not in the least as a result of a great and increasing diversity between water companies, uncertainties about available data, and the intricacies of the regulatory game. As Bakker (XXX DATE) has pointed out, the regulatory game that started with the privatisation (and ostensibly de-regulation) of the water industry unleashed a certain regulatory creep, which has developed into a top-heavy institutional-regulatory body. Given the territorial monopoly-character of the privatised water companies, all sort of regulatory procedures, such as investment target-setting, pricing, environmental standards, and abstraction and leakage standards, quality assurance, and the like, have been implemented. Rather than de-regulating the water sector, privatisation has resulted in a profound re-regulation of the water market and in a considerable quasi-governmental regulatory structure. In the process, the set of social actors involved in the institutional and regulatory framework of the water sector has been significantly altered, with a new geometry of social power evolving as a consequence. This new choreography of institutional and regulatory organisation is what we shall turn to next.

*The re-scaling of the governance of water: from water government to water governance*

A host of new institutional or regulatory bodies have been set-up (in the UK appropriately called Quango's) that have considerable decision-making powers, but operate in a shady political arena with little accountability and only limited forms of democratic control. These institutional changes have been invariably defined as part of wider shift from government to governance (Swyngedouw, 2000). Whereas in the past, water management and water policy were directly or indirectly under the control of a

particular governmental scale, i.e. either at the national state and/or the local (municipal) level, in recent years there has been a massive proliferation of new water-related institutions, bodies, and actors that are involved in policy-making and strategic planning at a variety of geographical scales. The successive generations of water-related directives and regulations at the EU level and the torturous process of implementing an integrated EU policy – in the form of the European Water Framework Directive -- have resulted in growing powers of the Commission over water-related issues. The political history of the successive stages of negotiating the framework directive suggests a rather tumultuous path in which various actors (such a national governments, water providers, the Commission, the European Parliament, NGOs of a variety of kinds) played different roles, while their influence changed over time (Kaika, 2001).

In addition – as the UK case shows -- privatisation required setting-up a series of new regulatory bodies (OFWAT in particular) and a re-definition of the powers and prerogatives of existing regulatory organisations such as those of the National Rivers Authority that became integrated in the newly created Environment Agency. Finally, privatization itself of course results in much greater power and autonomy in terms of strategic and other decision-making for the companies themselves. Privatisation de facto means taking away some control from the public sector and transferring this to the private sector. This not only changes decision-making procedures and strategic developments, but also affects less tangible elements such as access to information and data.

The combined outcome of the above has been a more or less significant (very significant in the case of the UK, less so in the case of, say, the Netherlands) re-configuration of the scales of water governance. As Bob Jessop (1994) has pointed out for other domains of public life, the national scale has been re-defined (and partially hollowed-out) in terms of its political power, while supra-national and sub-national institutions and forms of governance have become more important. Privatisation, in turn, has led to the externalisation of a series of command and control functions. The result is a new scalar 'gestalt' of governance, characterised by a multi-scaled articulation of institutions and actors with varying degrees of power and authority. Traditional channels of democratic accountability are hereby cut, curtailed, or re-defined. A plethora of new

institutions has been formed at a variety of geographical scales. This proliferation of ‘governing bodies’ has diminished the transparency of the decision-making process and renders it more difficult to disentangle and articulate the power geometries that shape decision-making outcomes. In practice, it can be argued that the transition from government to governance has implied — despite the multiplication of actors and institutions involved in water management— the transfer of key economic and political powers to the private component of the governance complex. This, however, has not happened in a social vacuum and has rather fuelled a constellation of social and political conflicts, not least because of the consequences of an increasingly private-oriented governance model for the sustainability of socio-environmental systems.

### **2.3. Proliferating socio-spatial and socio-environmental water conflicts.**

The widening urban water footprint and the expanding scale of urban water operations as a result of either increasing per capita demand and/or a still growing urban population results in a continuing need to expand the city’s water resource basis. Despite attempts to manage demand, total production capacity has increased in all cases (although at a lower rate than in earlier years). This has resulted in either effective growth of water extraction and/or growing pressures to expand water production capabilities. At the same time, pressures for alternative use of the available water (ecological, recreational, industrial, or other) have increased, often in a context of extremely limited quantity or unreliable quality of available resources. Although pressures differ from country to country and from city to city, they are real and have led to more or less serious conflicts or threaten to do so in the near future. The Tel Aviv case is of course the most notorious one. In years of limited rainfall, the existing integrated national water system from which Tel Aviv draws its water reaches its full capacity. Moreover, some of the aquifer waters that were used cannot any longer because of saline water intrusion. Finally, the peace process with the Palestinians (perhaps defunct while we write this article) has resulted in a promise to divert more water to Gaza where more than a million people live on

currently a very limited supply of circa 25 liter/person/day. The negotiations with Syria, moreover, on the future of the Golan Heights (of which parts belong to the drainage basin of the Lake of Galilee, the most important water source of the country) may also affect the total water balance of Israel. Negotiations are currently under way to buy and import water from Turkey. The latter has surplus water, partly as a result of the construction of the Anatolia water project, which captures headwaters from rivers that are central for watering the Kurdish region and other middle-east countries. If this goes ahead, an already precarious regional socio-spatial condition will extend its geo-political remit to a wider geographical area and intensify an already complex and conflict-ridden situation.

Less dramatically, the urban water condition in Seville, which is subject to the hydrological circumstances of the Guadalquivir river and its tributaries, is directly linked with the ever growing needs of the agricultural sector for more irrigation water. The EU's agricultural policy demands ever greater productivity from the agricultural sector, which in Andalusia requires greater quantities of regulated irrigation waters. During recurrent dry periods, conflicts between the agricultural sector and urban water use need to be carefully negotiated politically. Furthermore, the demand for more water from the part of the city and its proposed new dam construction meets with ecological objections. Conflicts between extracting areas and the expanding water footprint have also been identified for Athens, while the new proposed reservoir by Thames Water for the supply of London and its region is highly controversial. For Amsterdam, the dune-based water storage and purification system is under pressure from continuing urbanization processes. In sum, the expanding water frontier of urban water meets with increasing resistance and is characterised by intensifying conflict around a series of tension-lines.

In addition to these socio-environmental and spatial conflicts, the drive towards privatisation has re-opened the debate over the status of water. While general access to water at a very low or moderate price for the whole population was the received wisdom during the 'Statist' period, current practices, aimed at running water services according to the market logic, re-opened the debate over water accessibility. In Britain, for example, the growing number of people that were disconnected from water supply because of non-payment rose sharply during the first years after privatisation (Herbert *et. al.*, 1995).

Eventually, on the basis of growing concerns with rising social exclusion and health risks, the government (like in other countries) was forced to pass legislation that banned disconnection and obliged water companies to deliver a minimum volume of water.

#### **2.4. The Discourse of Crisis and its Politics: the contested politics of demand management.**

##### *The discursive production of 'scarcity'*

In all of our case studies, increasing attention is paid to demand management, mainly as a result of the growing environmental awareness and the risk of dwindling water resources, which has intensified the political and social debate about the 'scarcity' of water (Nevarez, 1996). As Kaika (1999) has pointed out, this discursive built-up of a particular water narrative and ideology, particularly noticeable during, for example, the drought-related crisis conditions in Athens in the early eighties, serves specific political and economic objectives and policies. A climate of actual, pending, or imagined water crisis not only serves to facilitate further investment in the expansion of the water-supply side (as in the case of Athens or Seville), it also fuels and underpins drives towards commodification. As the price signal is hailed as a prime mechanism to manage 'scarcity', the discursive construction of water as a 'scarce' good becomes an important part of a strategy towards commodification, if not privatisation. In this context, strange and often unholy political alliances are forged between free marketeers and parts of the environmental movement. While the latter's concern about the increasing, but socially constructed, scarcity of water and their growing effectiveness in mediating this message to the wider public, a greater willingness-to-pay and the acceptance of the market mechanism as the preferred signal to socially allocate the resource becomes seen as more acceptable, if not presented as the only alternative available.

##### *The politics of the technological fix.*

The management of the urban water cycle and, in particular, the management of demand operates largely via a combination of campaigns aimed at raising public awareness about water savings on the one hand, and attempts at reducing water consumption by means of a variety of technological fixes on the other. Generally the cost effectiveness of water saving devices depends both on the price of the technology and the price of water. In a context of low water prices, water-saving devices are often not cost-effective. Although it is still disputed what the aggregate effect is on water savings (most studies indicate a slow-down in the growth of water demand, but not a reversal of upward trends), the technological fix for water-related problems requires significant investments. Privatised water companies remain reluctant to invest in such technologies (given the cost implication), while public subsidies might be seen as a subvention to the private sector (in the case of a privatised water sector) or run against the dominant ideology of full cost recovery (in case of public companies). In addition, EU competition regulations might ban such state support. Despite availability, therefore, of a wide range of water-saving devices and technologies, uptake remains limited and is not likely to have a major impact in the near future. More importantly, the displacement effects (in terms of the environmental implications associated with the development and production of new technologies) is almost invariably completely ignored and not part of the environmental audit. Yet, it is abundantly clear that environment-friendly technologies when applied in one sector might have adverse effects in terms of the environmental effects of their own production process. A total environmental audit would be required in order to assess the net environmental benefit derived from a technological fix.

## **2.5. Globalising H<sub>2</sub>O and uneven development**

The commodification and privatisation of H<sub>2</sub>O is increasingly embedded in processes of economic globalisation. Whether publicly or privately owned, water businesses are increasingly expanding their operations geographically and become embedded in an international competitive process. In the case of privatised companies, furthermore, their capital structure is also becoming increasingly internationalised. For example, after the

UK government opened the water sector to market competition in December 1994, a frenzied merger and take-over activity started to take place. Many UK water companies are actively acquiring water operations elsewhere in the world, while British companies have been subject to take-overs from foreign competitors. For instance, Thames Water (London's water supply company) was acquired in September 2000 by the German multi-utility RWE. At a global scale, an accelerated process of concentration and consolidation is taking place that is rapidly leading to a fairly oligopolistic economic structure of water utility companies on a world scale. Regardless of the difficulties of regulating global companies (particularly with respect to environmental and social standards, investments, maintenance and infrastructure upkeep), it raises the spectre of increasing geographical strategies around investments and about the spread of activities, the flow of water-capital, and the portfolio of holdings. In addition, it opens the possibility of withdrawal of water companies from particular places and sites, opens up the possibility of strategic cherry-picking and might even lead to bankruptcies or liquidation of activities. For a sensitive and vital sector like urban water supply, each of the above might potentially threaten urban sustainability conditions. In addition, it might lead to a situation in which the necessary provision of water for more problematic (i.e. costly) areas of the city has to be undertaken by the public sector, while the private sector picks places that optimise corporate profitability.

### **3. Crisis moments and tendencies: a question of sustainability?**

#### **3.1. What needs to be sustained?**

The political-ecological assessment of the urban water cycle raises serious issues with respect to the debate on sustainability and its political practice. Although the concept of 'sustainability', given its well-known and well-documented inherent ambiguity and messy definition (Wilbanks, 1994), remains widespread and widely-used (often exactly because of its imprecise, diffuse, and multiple interpretative meanings) in policy documents and debates. A political-ecological perspective maintains that 'sustainability'

is necessarily a chaotic concept unless a clear and explicit specification is given of who decides what needs to be sustained for whom, where, and why (Robinson, 1994). Socio-ecological processes are inherently uneven, both in terms of their costs and benefits in social, economic, environmental, or cultural terms. Moreover, ecological effects and social implications cannot be easily separated from each other. A political-ecological approach would be more concerned with analysing and proposing the substantive and procedural mechanisms through which a more equitable choreography of social power is achieved in terms of the particular kinds of socio-ecological environments that shall be produced. In this sense, 'sustainability' is invariably positioned or situated (Haraway, 1991; 1997). In sum, urban sustainability refers here to the capacities individuals and social groups have in producing the socio-environmental conditions of which they are part without violating the rights of others to do so as well (Harvey, 1996). A pivotal criterion here is to achieve an equitable distribution of social power and a transparent and democratic decision-making procedure. The critical moments of the urban water cycle as elucidated in part II will be translated here in terms of questions of sustainability as defined above.

### **3.2. Urban sustainability and critical moments in the water cycle**

*Urban water: public good or private commodity?*

The recent shift towards turning H<sub>2</sub>O into a commodity has profound implications on the social and political meaning and cultural valuation of water. First of all, water is turned into profits and capital accumulation by private or public/private institutions. Supplying water becomes hereby a means to achieve an economic goal post: economic growth and profit maximisation. To the extent that private companies do this, water-related activities become just a strategic element within a predominantly corporate strategy of companies that are becoming rapidly multi-utility and international. Second, non-economic uses and functions of water have then to be regulated by governmental institutions that often face serious opposition, conflict, or other constraints in the face of

powerful private agencies. Moreover, it becomes increasingly difficult, if not impossible, to integrate water policies within a wider urban, social, or economic policy that would involve cross-subsidisation, alternative uses of water, or a socially stratified policy. Third, this shift inevitably entails a change in the geometry of social power. Private actors and companies become much more powerful voices in strategic water-related decisions, at the expense of other civil society organisations or of the state. Fourth, while the water cycle operates on temporal rhythms that are part of the larger environmental system, it is nevertheless increasingly forced to operate under the standard discounting periods of corporate strategists and of economic cycles. Fifth, the privatised nature of crucial parts of the water cycle diminishes the transparency of decision-making procedures and limits access to data and information that could permit other social groups to acquire the relevant information on which to base views, decisions, and options. Finally, water production and distribution becomes incorporated into an increasingly global economy in which investment flows, financial capital markets, and investment decisions shape the contours in which the urban water economy operate. In sum, the shift from public good to private commodity alters the choreography of power through which the urban socio-hydrological cycle is organised.

#### *The supply/demand nexus and the investment/pricing conundrum*

At a moment when the price signal becomes a central organising principle of water markets, and in a context of relatively fixed supplies, demand management becomes tricky business. Monopolistic market control that is inevitably associated with water supply networks demands a strong price-regulation by the State or other governmental agencies. In addition, efforts to reduce water consumption for environmental reasons is countered by cost-recovery requirements that hinge on price setting and produced quantities. Invariably, water companies are operating in the two-pronged wedge of price-setting regulatory systems on the one hand and costly technological/organisational investments to enhance productivity on the other. The triad investment/price/supply becomes very difficult to manage, particularly in a context of

increasing pressures to reduce demand. All case studies suggest a continuing tendency to increase supply despite rhetorical attention to demand management. The costly introduction of water saving technologies is, at best, slow, while major efforts are made to increase supply despite often formidable opposition. It is becoming abundantly clear that the price signal is insufficient to regulate the allocation and efficient use of a resource like water. Particularly when ecological or cultural aspects play an increasingly important role, the regulation of which demands political rather than economic instruments.

### *Socio-spatial struggle over water*

The twin tension of continuing increasing demand for urban water on the one hand and the mounting pressure to allocate water to other functions on the other has proliferated socio-spatial tensions and conflict over water abstraction, water allocation, and water use. These conflicts can take a variety of forms, ranging from a growing social differentiation within the city in terms of water consumption, conflicts over urban versus agricultural, industrial, or ecological use, to conflicts between resource extraction areas and urban consumption areas (reflected in conflicts over new reservoirs or dam constructions). In addition, the globalisation of water companies signals a strategy in which local waters, turned into capital, are geographically re-allocated to other places and cities. For example, London's water company has taken over part of Jakarta's water supply system. Invariably, the outcome of these struggles and conflicts is expressive of the uneven power relations that infuse the organisation of the hydro-cycle.

### *New actors and grey accountability*

The proliferation of regulatory bodies and systems of governance associated with the hydro-cycle, at local, national, or international scales, has contributed to the emergence of a 'thick' regulatory structure, at least in developed countries, with ambiguously defined responsibilities and an imprecisely defined accountability. Depending on the geographical scale of organisation or on the particular institutional

embedding of the water companies, a differing set of actors is involved in the decision-making procedures. The choreography of ‘stake-holder’ participation is uneven and unequal and, in many instances, operating outside traditional political democratic channels. While some actors are well represented in some settings, they are excluded from others; still others remain totally absent from the arenas of power where fundamental decisions are made.

*Water and market risk: The globalisation of water and uneven development*

To the extent that water companies operate increasingly as private economic actors, they are also increasingly subject to standard market risks. While providing a fundamental and essential service, the economic survival of water operations is not necessarily guaranteed. Take-overs, disinvestments, geographical re-allocation, bankruptcies, inefficient operations, and the like are of course endemic to a private market economy. In fact, this is exactly what market dynamics are supposed to do, i.e. to weed out under-performing companies, and to re-allocate economic resources from less to more profitable activities. This raises particular questions with respect to the long-term sustainability of market-based urban water supply systems. In absence of strong incentives to enhance productivity or efficiency, and given the high cost and long time horizon of fixed capital investments in water infrastructure, private companies may fail to keep water systems running efficiently. This would, in the medium term, lead to a situation in which the State (at whatever level) has to get involved again in the water sector in more direct ways. This is already clear in the UK context (as well as in Athens). There is a tendency to leave the network/infrastructure part of urban water networks to the public sector, while profitable operational and managerial activities are secured by private companies. This entails, in fact, an indirect subsidy of the private sector by the state and, in market terms, distorts the operation of the market. In fact, in a context in which risk of failure of water supply is too dramatic to contemplate, the state will have to remain (are become again) a key player in organising water supply systems. This will

become even more pronounced as environmental and sanitary standards in urban areas continue to decline.

Moreover, risk of failure does not only pit urban residents against water suppliers, but failing or too expensive a water supply brings also serious risk to other economic sectors. To the extent that urban economies are increasingly service-based, a mixture of business and personal service activities, tourism, and spectacular urban festivals, reliable and cheap urban water supply (like other collective means of production) is a key ingredient to the economic success of cities.

#### **4. Conclusion: Producing sustainable urban environments**

Producing sustainable urban environments, therefore, requires a political and administrative system that involves all relevant social actors at all geographical scales. In addition, it requires a policy framework that does not isolate the circulation of water from other sustainability-related processes. In fact, it requires a more comprehensive and integrated approach in which supply of water is integrated with health and sanitation policy, ecological considerations, socio-economic processes, and urban planning and governance systems. The increasing fragmentation of policy domains (partly as a result of commodification and privatisation) makes this objective more remote than ever.

## Bibliography

- Amin A. (Ed.) (1994) *Post-Fordism: A Reader*. Blackwell, Oxford.
- Bakker K. (1999) *Privatizing Water: The political ecology of water in England and Wales*. Unpublished DPhil Thesis, School of Geography and the Environment, Oxford, University of Oxford.
- Bakker K. (2000) "Privatizing Water: Producing Scarcity: The Yorkshire drought of 1995" *Economic Geography* 76 (1)
- Bakker K. (2001) "Paying for Water: Equity and Water Pricing in England and Wales" *Transactions of the Institute of British Geographers*
- Benton T. (Ed.) (1996) *The Greening of Marxism*. Guilford Press, New York.
- Bernstein M.A. (1955) *Regulating Business by Independent Commission*, Princeton University Press, Princeton, N.J.
- Bond P. (1997), 'Privatization, protest and participation: citizen opposition to the World Bank in Haiti and South Africa', paper presented to the World Bank/NGO Dialogue on Privatization, Washington D.C.: Friends of the Earth/World Bank.
- Braun B., Castree N. (Eds.) (1998) *Remaking Reality – Nature at the Millenium*. Routledge, London.
- Burgess R., M. Carmona, et al. (1997) *The Challenge of Sustainable Cities*. London, Zed Books.
- Cronon W. (1991) *Nature's Metropolis: Chicago and the Great West*. W.W. Norton, New York.
- Cutter S. L. (1995). "Race, class and environmental justice." *Progress in Human Geography* 19(1): 111-122.
- Environment Agency (1997) *Saving Water: Taking Action*. The responses to the Consultation Report on Water Conservation and Demand Management, Bristol: National Water Demand Management Centre.
- Environment Agency and The Local Government Management Board (1998), *Sustainable Water Management – Promoting Water Efficiency, Local Agenda 21 Roundtable Guidance*, London: EA & LGMB.
- Escobar A. (2001) "Culture Sits in Places: Reflections on Globalism and Subaltern Strategies of Localization", *Political Geography*, 20, 139-174.
- Gandy M (1997) "The making of a regulatory crisis: restructuring New York City's water supply", *Transactions; Institute of British Geographers*, 22, pp. 338-358
- Gottlieb R., Fitzsimmons M. (1991). *Thirst for Growth*. Tucson, The University of Arizona Press.
- Goubert, J.P. (1989) *The Conquest of Water*. Polity Press, Cambridge.
- Haraway D. (1991) *Simians, Cyborgs and Women - The Reinvention of Nature*, Free Association Books, London.
- Haraway D. (1997) *Modest-Witness@Second-Millennium.FemaleMan©-Meets\_ OncoMouseTM*, Routledge, London.
- Hardoy A., Schusterman R. (1999), 'Las privatizaciones de los servicios de agua potable y saneamiento y los pobres urbanos', *Medio Ambiente y Urbanización*, Vol. 15, # 54, pp. 63-76.
- Harvey D. (1996) *Justice, Nature and the Geography of Difference*, Blackwell, Oxford.
- Hassan J. (1998) *A History of Water in Modern England and Wales*. University Press, Manchester.
- Haughton G., Hunter C. (1994). *Sustainable Cities*. London, J. Kingsley.
- Herbert A., Kempson E. (1995), *Water Debt & Disconnection*, London: Policy Studies Institute (PSI).
- Herrington P., Price C. (1987) *What Price for Private Water*, Public Finance Foundation, London.
- Hundley, N. (1992). *The Great Thirst*. Berkeley and Los Angeles, University of California Press.
- Jessop B. (1994) *The Transition to Post Fordism and the Schumpeterian Workfare State*. In Burrows R., Loader, B. (Eds.) *Towards a Post Fordist Welfare State?*, Routledge, London, pp. 13 37.
- Kaika M., Swyngedouw E. (2000) *Fetichizing the Modern City: The Phantasmagoria of Urban Technological Networks*, *International Journal of Urban and Regional Research*, 24 (1), pp. 120-138.
- Kaika M. (1999) *Modernity and the Urban Spaces of Produced Nature: the Politics and Culture of the Urbanisation of Water in Athens (1834-1999)*. Unpublished DPhil Thesis, School of Geography and the Environment, Oxford, University of Oxford.

- Kaika, M. (2001). Creating the European Water Framework Directive Interim Project Report: "Achieving sustainable and innovative policies through participatory governance in a multi-level context". University of Oxford, Project contract no: HPSE-CT-1949-00028: 30-97.
- Keil R. (Ed.) (2000) *Political Ecology: global and local*. Routledge, London.
- Keil R., Graham J. (1998) Reasserting Nature: Constructing Urban Environments after Fordism, in Braun B., Castree N. (Eds.) *Remaking Reality – Nature at the Millenium*. Routledge, London, pp. 100-125.
- Laituri M., Kirby A. (1994). "Finding Fairness in America's Cities? The Search for Environmental Equity in Everyday Life." *Journal of Social Issues* 50(3): 121-139.
- Laski H. J., Jennings W.I., Robson W.A. (Eds.) (1935), *A Century of Municipal Progress 1835-1935*, London: George Allen & Unwin.
- Latour B. (1993) *We Have Never Been Modern*, Harvester Wheatsheaf, London.
- Latour B. (1996) "To modernize or to ecologize? That's the Question", in Braun B., Castree N. (Eds.) *Remaking Reality – Nature at the Millenium*. Routledge, London, pp. 221-242.
- Latour B. (1999) *Politiques de la Nature – Comment faire entrer les sciences en démocratie*. La Découverte, Paris.
- Littlechild S. (1988). "Economic regulation of privatised water authorities and some further reflections." *Oxford Review of Economic Policy* 4: 2.
- Littlechild S.(1986)*Economic Regulation of Privatised Water Authorities* HMSO, London.
- Lorrain D., Stoker G. (1997) *The Privatization of Urban Services in Europe*, London: Pinter.
- Maloney, W. A., Richardson J. (1995) *Managing Policy Change in Britain: the Politics of Water*, Edinburgh: Edinburgh University Press.
- Martin S., Parker, D. (1997) *The Impact of Privatisation: Ownership and Corporate Performance in the UK*, Routledge, London.
- Millward B. (1991), "Emergence of gas and water monopolies in nineteenth century Britain: contested markets and public control", in J. Foreman-Peck (Ed.) *New Perspectives in Late Victorian Economy: Essays in Quantitative Economic History 1860-1914*, London: Cambridge University Press.
- Moulaert F., Swyngedouw E. (1987) "A Regulation Approach to the Geography of the Flexible Production System" *Environment and Planning D: Space and Society*, Vol. 7, pp. 327-345.
- Mukhopadhyay A. K. (1975) "The politics of London water", *The London Journal*, Vol 1., #2, pp. 207-226.
- Nvarez L. (1996) "Just wait until there's a drought: mediating environmental crises for urban growth", *Antipode* 28 (3) 246-272
- Newman,P. (1990) *Social organisation for ecological sustainability: toward a more sustainable settlement pattern. Social Structures for Sustainability: fundamental questions Paper No 11*. Canberra, Centre for Resource and Environmental Studies, Australian National University.
- Norgaard R. (1994) *Development Betrayed*. London: Routledge.
- O'Connor J. (Ed.) (1998) *Natural Causes: Essays in Ecological Marxism*. Guilford, New York.
- Office of Water Services (1999) "Checks, balances and competing pressures looking forward at the role of the regulator", Director General's Address to the Centre for the Study of Regulated Industries, 13 September 1999, London: London School of Economics.
- Office of Water Services (2000a) *The Current State of Market Competition*, Birmingham: OFWAT.
- Office of Water Services (2000b) *The Changing Structure of the Water and Sewerage Industry in England and Wales*, Birmingham: OFWAT.
- Office of Water Services (2000c) *New Ownership Structures in the Water Industry. A Consultation Paper by the Director General of Water Services*, Birmingham: OFWAT.
- Parker D. (1997) *Privatisation and Regulation: Some Comments on the UK Experience Occasional Paper No.5*. CRI, CIPFA, London.
- Peet R., Watts M. (Eds.) (1996) *Liberation Ecologies*. Routledge, London.
- Peet, R. and M. Watts (1993). "Introduction: Development Theory and Environment in an Age of Market Triumphalism." *Economic Geography* 69(3): 227-253.
- Robinson, M. (1994). *Sustainable development, but for whom?* London, CAFOD (Catholic Fund for Overseas Development).
- Satterthwaite D. (1999) *The Earthscan Reader in Sustainable Cities*. Eartscan, London
- Savedoff W., Spiller P. (1999) *Spilled Water. Institutional Commitment in the Provision of Water Services*, Washington D. C.: Interamerican Development Bank (IDB).

- Swyngedouw E. (1996) "The City as a Hybrid: On Nature, Society and Cyborg Urbanization", *Capitalism, Nature, Socialism*, 7(2), pp. 65-80.
- Swyngedouw E. (1999b) "Modernity and Hibridity: Nature, Regeneracionismo, and the Production of the Spanish Waterscape, 1890-1930", *Annals of the Association of American Geographers*, 89(3), pp. 443-465.
- Swyngedouw E. (2000). "Authoritarian Governance, Power and the Politics of Rescaling", *Environment and Planning D: Society and Space*, 18, pp. 63-76.
- Swyngedouw E. (1997) "Power, Nature and the City. The Conquest of Water and The Political Ecology of Urbanization in Guayaquil, Ecuador: 1880-1980", *Environment and Planning A*, 29(2), pp. 311-332.
- Swyngedouw E. (1998). "Homing In and Spacing Out: Re-Configuring Scale", in Gebhardt, H., Heinritz, G. and Weissner, R. (Eds). *Europa im Globalisierungsprozess von Wirtschaft und Gesellschaft*. Stuttgart: Franz Steiner Verlag, 81-100.
- Swyngedouw E., Kaika M. (2000) *The Environment of the City or ... the Urbanization of Nature*, in Bridge G., Watson S. (Eds.) *Companion to Urban Studies*, Blackwell, Oxford.
- Taylor G. (1999) *State Regulation & the Politics of Public Service. The Case of the Water Industry*, London and New York: Mansell.
- Ward C. (1997) *Reflected in Water. A Crisis of Social Responsibility*, London and Washington: Cassell.
- Wilbanks T. J. (1994). "Sustainable development' in geographic perspective." *Annals of the Association of American Geographers* 84(4): 541-556.