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Degrowth initiatives in the urban water sector? A social multi-criteria evaluation of non-conventional water alternatives in Metropolitan Barcelona

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ABSTRACT

Debates on degrowth have mainly focused on theoretical issues, specially around the unsustainability of the current economic model based on growth. Along those lines some scholars have dealt with the opportunities and barriers to voluntary social action for degrowth at a general level. Notwithstanding the key importance of such debates, we argue that local strategies to move towards degrowth are still to be explored. Departing from the specific case of water, in this paper we interrogate the compatibility of non-conventional centralised and decentralised water supply technologies (desalination, reclaimed water reuse, greywater reuse and rainwater harvesting) with degrowth principles. Taking as a case study the Metropolitan Area of Barcelona (Spain), a social multi-criteria evaluation has been performed to explore the feasibility, desirability and acceptability of both models. The paper aims to explore the pros and cons of the different water alternatives in two different (and hypothetic) societies: one based on growth (business-as-usual) and one based on degrowth. The technical analysis reveals that rainwater harvesting and reclaimed water reuse are the most preferred alternatives from a degrowth perspective while reclaimed water reuse and desalination are the most preferred alternatives from a growth perspective. The social multi-criteria analysis also serves to unveil which social actors may favour or block the adoption of each alternative. Notwithstanding that most social groups see desalination as the least desired option, this is the hegemonic non-conventional source in Spain which evidences the prevalence of growth discourses in water management. Local decision-makers, city council managers and environmental groups clearly opt for the promotion of rainwater harvesting and as a result, they appear as potential allies to promote degrowth in water consumption. The social multi-criteria evaluation helps to elucidate the main challenges that need to be addressed in the pursuit of a more sustainable and equitable water management.

1. Introduction: the looming water crisis and the changing water paradigms

Industrialised societies have based their development in the escalating production and consumption of goods and services. This production–consumption nexus has resulted in an unsustainable extraction and use of a large variety of natural resources of which water constitutes a prime example. Water crises are meant to be common feature of the world of the 21st century (Gallopin and Rijsberman, 2000; Rijsberman, 2006), and could be further aggravated by climate change (Alcamo et al., 2007; Arnell, 2004). Currently, about one-third of the world population lives in countries with moderate-to-high water stress (UNEP, 2002). By 2030, this figure is expected to increase to about half of the world population (World Water Assessment Programme, 2009). Similar to the concept of "peak oil", the concept of "peak water" (Palaniappan and Gleick, 2008) suggests that water, although renewable, may become a limited resource in certain cases, especially at regional and local scales where water available for consumption may be restrained if demand exceeds renewable resources or water is polluted.

By 2020 water use is expected to rise by 40% with respect to the beginning of the century (World Water Council, 2000). The construction of large and sophisticated infrastructures such as dams or water transfers has been the main strategy followed to meet the growing water demand of urban agglomerations and irrigated agriculture (Saurí and del Moral, 2001; Kallis and Cocossis, 2003). Opposition to these types of megaprojects is, however,

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growing, since these expensive infrastructures produce severe damages on aquatic ecosystems and local populations (McCully, 1996; World Commission on Dams, 2000). Against this situation of growing water use and environmental degradation, and drawing on Schneider et al. (2010), in this paper we attempt to bring the debate on degrowth (introduced by Georgescu-Roegen in the 1970s) (Georgescu-Roegen, 2006) and further developed during the last years (see for instance Latouche, 2006, 2010) to the urban water sphere.

In opposition to supply-side strategies such as the construction of large-scale infrastructures based on economic growth and an increasing water demand rationale, water demand management strategies have increasingly gained recognition, particularly at the local level. However, among the different strategies of Demand Side Management (DSM), economic tools reign supreme as the hegemonic mechanism to allocate water resources. Environmental Economics has dominated this debate, casting water price as a powerful way to manage demand: high prices are believed to lead to low consumptions. However, price mechanisms show some limitations: for basic uses water is price inelastic (meaning that consumption does not decline at the same pace as price rises), and this may bring some issues especially for the less well-off. In addition, there is still an ongoing debate on how to incorporate the environmental externalities on water pricing. All in all, and despite the clear benefits for the environment, as water consumption may drop (together with energy use related to water use) and externalities become better reflected in prices, the application of reductionist economic instruments may change the perception of the resource as well. Thus, water could change from being considered a common resource to being considered a commodity, and thus may cause unintended effects on those having less economic power.

On the other hand, under the umbrella of Ecological Modernisation, technology has been the other strategy of DSM, as it permits to elude political questions and move the solution of water and other environmental problems to the scientific and technocratic field in a process that Swyngedouw and other authors call the post-political condition (BAVO, 2007).

In recent times, the use of new water sources, different from the more traditional surface water withdrawals or underground water extraction, is growing in order to cope with the challenges that water management faces all over the world. However, new sources such as desalinated water, reclaimed water (i.e. wastewater treated to a high degree to be reused in secondary uses), greywater or rainwater present very different characteristics.

These non-conventional techniques generate different water qualities and thus may be used for different water purposes. Notwithstanding this, they may serve to alleviate water stress by both reducing the quantity of water demanded from conventional sources and by providing more resilience to the water supply system of a given place. In general terms, they can be divided according to two different management models: centralised and decentralised. Desalination and water reclamation usually share the features of centralised models since water is usually treated in large facilities and transported through long networks before being consumed. Decentralised systems such as rainwater harvesting and greywater reuse rely on local water sources that may be "produced" on-site, at the house or building scale. Another distinctive feature of these two models is their dominant form of governance. Centralised systems serve many users and are governed by either public or private water companies while decentralised systems serve few people and are usually governed by the users themselves. It is acknowledged that both models are not totally exclusive and can indeed be complementary in some circumstances but at the same time, public policies usually tend to favour one of the two models. For instance, in some municipalities of the Metropolitan Area of Barcelona (MAB), public policies are starting to stimulate the use of decentralised water supply systems in new buildings while at the national level public policies usually favour the use of centralised systems.

2. Objectives of the paper

Debates on degrowth (see for example the different contributions in this issue) have mainly focused on theoretical questions, and especially on the unsustainability of current trends (Alcott, 2010; D'Alessandro et al., 2010; Hueting, 2010; Kerschner, 2010; Spangenberg, 2010). The overall rationale of these contributions has been one of breaking the myth of growth (see for instance Van den Bergh, 2010), or highlighting the opportunities and barriers to voluntary social action for degrowth (Hamilton, 2010; Matthey, 2010). While acknowledging the key importance of such debates, we argue that local strategies are to be explored in order to move towards degrowth, as said by Research and Degrowth (2010) in the Degrowth Declaration of the Paris 2008 conference. In this sense, we find relevant the contributions of Lietaert (2010) and Cattaneo and Gavaldà (2010) around degrowth and new forms of understanding our way of living.

Taking as a case study the MAB and by means of a social multicriteria evaluation (SMCE), this paper attempts to compare four non-conventional water sources (desalinated seawater, reclaimed water, rainwater and greywater) in order to gain knowledge about their real and perceived socioenvironmental performance. Furthermore, and drawing on the principles of a growth and degrowth paradigm, the paper attempts to contribute to the debate on the desirability and feasibility of these non-conventional water sources in these two contexts. Finally, the paper also intends to unveil the main social actors behind each water alternative.

The following premise constitutes the starting point of this research: in urban settings the use of desalinated seawater, reclaimed water, rainwater and greywater is increasing but these sources receive different levels of public support due to their differing characteristics (Brown et al., 2009; Dolnicar and Schäfer, 2009).

3. The use of non-conventional water resources in Metropolitan Barcelona

The equilibrium between water supply and demand in the Metropolitan Area of Barcelona (MAB), one of the most important urban conurbations of Southern Europe with more than three million people in 2010, has been historically fragile (Saurí, 2003). Several episodes of water scarcity have taken place during the 1990s and the early 21st century and climate change is expected to worsen this situation (Llebot, 2005). Water scarcity in the MAB became especially evident in 2008 when the area suffered an acute drought episode resulting in water restrictions for a number of uses. The area was just days away from possible domestic cuts and water had to be shipped by sea tankers from different locations of the Mediterranean coast. At the same time, this crisis opened an interesting debate around the needs of water of Barcelona's social metabolism and whether the region water scarcity responded to physical or social factors. Water demand management was central during drought management. Awareness campaigns were launched asking for a reduction of water consumption and for citizen's contribution to confront the drought. Furthermore, outdoor water uses such as gardening watering and swimming pool filling-up were forbidden during the drought. Technological devices such as aerators were also distributed to reduce water consumption. While the urgent needs of more water were repeated like a mantra, there was an intense debate on how to provide the