Chapter 1
Expanding the Hydroinformatics Agenda: Information and Inequality behind Water Problems

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ABSTRACT
Hydroinformatics tools have increasingly offered a contribution towards the assessment of water management problems and the formulation of enhanced solutions. Nonetheless, the search for improved basis of water management requires not only a combination of technical and managerial responses, but also a firm action against socioeconomic injustices and political inequalities. This chapter problematises the role of hydroinformatics in situations of established inequalities and acute management distortions. A case study of the Baixada Fluminense, in the Metropolitan Area of Rio de Janeiro, illustrates the challenges to reverse unsustainable practices where water problems have been exploited by local and national politicians. Although the hydroinformatics community is certainly aware of the social dimension of water management, the aim is to further emphasise the centrality of issues of power and political disputes. The chapter concludes that the agenda of hydroinformatics needs to expand in order to combine state-of-the-art information technology with a critical understanding of how social and spatial differences affect the use and conservation of water systems.

INTRODUCTION: THE NEED TO ‘EXPAND’ THE HYDROINFORMATICS AGENDA

The search for new basis of water management represents one of the most relevant areas of public policies concerning the use and conservation of natural resources nowadays. Governments, regulators and academics have increasingly recognised the socionatural complexity of managing hydrological systems and called for a better integration of sectoral demands to deal with a growing, manmade scarcity of water (Shiklomanov, 2003). Water management is currently experiencing a transition from the previous focus on hydraulic infrastructure works to a new phase based on the
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adaptive, co-evolutionary coordination of improved responses that should be implemented at multi-actor and multi-scale levels (van der Brugge & Rotmans, 2007). A range of ‘soft-path’ solutions have been advocated to complement investments in the physical water infrastructure, such as low cost community-scale systems, decentralised decision-making, water markets and equitable pricing, the application of efficient technology and environmental protection measures (Gleick, 2006). Most of the emerging responses have been informed by the principles and instruments of environmental governance, which entail a transition to more flexible procedures that go beyond the traditional forms of intervention (Conca, 2006). Governance entails the “formation and stewardship of the formal and informal rules that regulate the public realm, the arena in which the state as well as economic and societal actors interact to make decisions” (Hyden et al., 2004: 16). Instead of the conventional exercise of authority, the search for governance is supposed to create lasting and positive changes according to goals such as openness, accountability, effectiveness and participation (Batterbury & Fernando, 2006). A more sustainable management of aquatic systems is expected to emerge from the integration of multiple processes and the active involvement of stakeholders (Davis, 2007), as in the case of the EU Water Framework Directive, which commands that the public should help to define the “rationale, framework, outcomes and validity” of the decision-making needed to achieve and maintain the good ecological status of all water bodies (European Commission, 2003: 14). Nonetheless, if the theory and the practice of water management continue to incorporate the requisites of environmental governance, there is also growing evidence of persistent inadequacies, such as the superficial involvement of the public, capture of the process by elite groups and insufficient transfer of responsibilities to the local level.

It is often the case that the translation of sustainability principles into action encounters major obstacles to breaking the link between economic growth and water demand (Syme & Nancarrow, 2006) or to effectively coordinating sectoral and local interests with political and development pressures (Mollinga, 2008). Regulatory institutions have been reformed in an attempt to integrate stakeholders and spatial areas, but these reforms have often failed to address a backlog of management distortions and social inequalities (Ioris, 2008). There is a growing appreciation that water sustainability requires concerted efforts towards forming a shared vision about the management of ‘socialised’ water systems (Barraqué, 2008). Instead of the traditional top-down formulation of policies and projects, the participation of local stakeholders passed to play a fundamental role in water management, which not only recognises the right of all to get involved, but can also improve the quality of the decision-making and increase the acceptance and ownership of sometimes controversial plans (Hophmayer-Torich & Krozer, 2008). Most countries around the world have tried to amend their regulatory framework and secure forms of public involvement and higher levels of transparency and accountability. The creation of new spaces of decision-making is also related to open flows of communication between local and central spheres of governance (vertical communication) and between stakeholders in the same area (horizontal communication). In that context, the example of The Netherlands is worth mentioning, particularly because this is a country where water has historically been an enemy to be fought and conquered, but in the last decades has opened new channels of communication and dialogue. The Dutch experience illustrates the fact that a participatory management of shared water resources requires much more than the organisation of meetings, consultations and commissions, but changes in the formal structure of decision-making need to be part of a genuine process of decentralisation and power sharing (Enserink et al., 2003). In fact, public participation should not be romanticised but also faces serious obstacles that need to be removed, such as the myth of com-