Rivers, Flows and People - Connecting Ecosystems with Human Communities, Cultures and Livelihoods

Des rivières et des hommes : relier les écosystèmes et les communautés humaines

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RÉSUMÉ

Les rivières sont des systèmes socio-écologiques - des moyens de subsistance assurant le bien-être de millions de personnes, des centres de culture et les dépositaires d'un capital naturel précieux dans chaque bassin du monde. Alors que l'insécurité hydrique et le rythme de développement des infrastructures hydrauliques s'intensifient, les flux environnementaux sont passés au premier plan puisqu'ils constituent une approche solide de la gestion permettant de maintenir la santé des rivières, la biodiversité et les moyens de subsistance. Les flux environnementaux visent à décrire la quantité, le moment et la qualité des débits d'eau requis pour maintenir les écosystèmes d'eau douce et d'estuaire ainsi que les moyens de subsistance et le bien-être humain qui dépendent de ces écosystèmes. Jusqu'à présent, les efforts se sont concentrés sur l'établissement, la consolidation et l'intensification de la science transversale de l'éco-hydrologie. Il est à noter que, jusqu'à récemment, les aspects sociaux tout aussi vitaux, tout comme les méthodes, connaissances, capacités et institutions essentielles pour les soutenir, sont restés faiblement développés et plutôt détachés de cet effort transdisciplinaire. De plus, il existe peu de ponts institutionnels qui relient les spécialistes des sciences sociales aux spécialistes des sciences naturelles spécialisés dans l'évaluation des flux environnementaux. Il est encourageant de constater qu'un élan important est en train de se développer dans ce domaine de croissance, pour faire en sorte que les sciences sociales deviennent un élément central à la fois de la politique et de la mise en œuvre efficace des flux environnementaux.

ABSTRACT

Rivers are socio-ecological systems - lifelines for the wellbeing of millions of people, centres of culture, and repositories of precious natural capital in every basin worldwide. As water insecurity and the pace of water infrastructure development intensify, environmental flows have taken the stage as a robust management approach for sustaining river health, biodiversity and livelihoods. Environmental flows are intended to describe the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems. Efforts to date have concentrated on establishing, consolidating and scaling up the cross-boundary science of ecohydrology. Remarkably, until recently, the equally vital social aspects, and the methods, knowledge, capacity and institutions essential to support them, have remained weakly developed and rather detached from this transdisciplinary effort. Moreover, few institutional bridges exist linking social scientists to those natural scientists with expertise in environmental flow assessment. Encouragingly, significant momentum is now building in this growth area, to ensure that the social sciences become a central element of both the policy and the practice of effective environmental flow implementation.

KEYWORDS

Culture, ecohydrology, environmental flows, rivers, social sciences

1 INTRODUCTION – RIVERS, FLOWS AND PEOPLE

People are at the very centre of river conservation and management. Rivers are recognised as complex, dynamic and heterogenous socio-ecological systems at multiple spatial and temporal scales, characterised by many interlinked social and ecological processes and feedbacks. They are lifelines for the wellbeing of millions of people, centres of culture, and repositories of precious natural capital in every basin worldwide. All human populations rely on freshwater ecosystems directly or indirectly for their daily security and wellbeing, from the provision of high quality water supplies and food, to transport, energy, recreation and a multitude of other services. Without these healthy functioning systems and the natural assets they represent, many of the water-associated benefits people rely on would be lost or compromised.

There is now considerable evidence of the global dimensions of the interrelationships between riverine ecosystem degradation and growing human water insecurity. If river systems are to survive the intensifying development pressures of the twenty-first century and beyond, including the pace of water infrastructure development, approaches to their conservation and management are required that are strategic and policy relevant, innovative, and more rapidly effective. Environmental flows have taken the stage as a robust water resources management approach designed to help meet this need. Achieving a more quantitative understanding of ecological and social responses to both natural flow variability and its alteration by humans is one of the fundamentally challenging goals of environmental flow practice (Poff et al. 2017).

The Brisbane Declaration of 2007, formulated during the 10th International Riversymposium and International Environmental Flows Conference held in Brisbane, Australia, highlighted the vital importance of environmentally sustainable water resources management. It provided the first internationally widely recognised definition of environmental flows as “the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems”. The area of environmental flows has generated a long history of achievements as an approach to protect and recover aquatic biodiversity, ecosystem integrity and important ecological services by managing freshwater flow regimes (Poff et al. 2017). Efforts to date have, however, disproportionately concentrated on establishing, consolidating and scaling up the cross-boundary science of ecohydrology.

Remarkably, until recently, the equally vital social aspects, and the methods, knowledge, capacity and institutions essential to support them, have remained weakly developed and rather detached from this transdisciplinary effort. Moreover, few institutional bridges exist linking social scientists to those natural scientists with expertise in environmental flow assessment. Encouragingly, significant momentum is now building in this growth area, to ensure that the social sciences become a central element of both the policy and the practice of effective environmental flow implementation.

There is growing attention, however, on the social dimensions of environmental flows, from the explicit inclusion of ecosystem services and their flow-linked dynamics, through to the broader areas of culture, indigenous water and social justice (Poff et al. 2017, Jackson 2017).

2 ADVANCING ENVIRONMENTAL FLOW IMPLEMENTATION - CONNECTING RIVERINE ECOSYSTEMS WITH HUMAN COMMUNITIES, CULTURES AND LIVELIHOODS

Environmental flow practitioners have increasingly called for revision and better integration of various aspects of the environmental flow cycle, from the determination of environmental flows through to their implementation. This has led to significant, incremental changes in the environmental flow process. These changes are discussed in relation to how they have helped build considerable momentum for greater consideration of the social aspects of environmental flows over time, particularly noticeable over the past five years. They have included, for example, the emergence and exponential growth of holistic type methods for determining environmental flows for rivers that incorporate the direct natural resource and livelihoods dependencies, and traditional knowledge, of local communities on river flow regimes (Poff et al. 2017). A stronger focus on more structured analysis and applied understanding of the governance and management systems supporting effective environmental flow implementation at different scales has also been promoted (Pahl-Wostl et al. 2013). Poff et al. (2017) identified several growth areas in the science and practice of environmental flows, as well as a number of guiding elements for their ongoing development, several of which address social aspects. These include, for instance, the need to explicitly and quantitatively describe both the flow-ecology and flow-social

relationships that will continue to provide the foundation of environmental water applications. Also highlighted is the need to engage stakeholders to collaboratively set an environmental water vision and the objectives that underpin it. Recently too, Jackson (2017) clearly framed the cultural challenge of environmental water management, with a particular emphasis on the rights and needs of indigenous people.

A diverse range of case studies across different world regions that have considered social factors in environmental flow assessment and implementation, including connecting social sciences with ecohydrology, and which cover a range of different geographic, socioeconomic development, and governance and management contexts, are described as illustrative examples. These are briefly examined in terms of the important ways in which they that have influenced and contributed to the accompanying shifts that have been observed in the policy, science and practice of environmental flows, from both flow protection and flow restoration standpoints. The key areas common to many of the environmental flow frameworks in use today are also discussed in the light of novel knowledge generated by these case studies and current experience, and several new elements are identified that more effectively incorporate important social considerations.

3 ADVANCING ENVIRONMENTAL FLOW IMPLEMENTATION FOR THE FUTURE

A decade on from the first international definition of environmental flows, as the pressure for more widespread and effective flow implementation intensifies, environmental flows have further evolved to even more explicitly recognise the vital roles of river water flows and levels in supporting human cultures, economies, sustainable livelihoods, and well-being. As a result, a revised Brisbane Declaration and Global Action Agenda on environmental flows are currently under discussion and development in 2018, including a revised definition of the scope of environmental flows. There is an accompanying urgent call for action to protect and restore environmental flows for rivers (and other aquatic ecosystems) for their intrinsic values for people and nature, biological and cultural diversity, and ecosystem services, as a central element of integrated water resources management. It is recognised that such action is an essential element of the foundation for achievement of the water-related Sustainable Development Goals in the future. Particular emphasis is given to the social and cultural dimensions of environmental flow management, from full and equal participation of all cultures, to respect for their rights, responsibilities and systems of governance in environmental water decisions.

It is evident that a new socio-ecological moment has opened-up for environmental flows that is more appropriate for and in tune with the social and environmental contexts and pressures now facing society. It is one of shared visions, innovation and transdisciplinarity in research, collaborative implementation programs, and adaptive governance and management of environmental water. The architecture of the international network of environmental flow practitioners is evolving rapidly in response, fostering increasing awareness, knowledge exchange and interaction between the ecohydrological and social disciplines and communities.

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