

SPECIAL SECTION: New Epistemologies of Water in India

Editorial: Setting the Context

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The Anthropocene and the “nine planetary boundaries” framework have informed, and in turn have been informed by, rigorous quantitative models and in-depth qualitative studies across global, regional, and local units of analyses.¹ Contemporary water research, by critically revisiting existing ontologies and epistemologies with the agenda of addressing “wicked problems”, is an advancement in this direction.² Wesslink, Kooy, and Warner (2017) point out that the motivation to combine disciplinary methodologies and study water from both the natural science and social science perspectives was driven by the need to collectively understand complex and interdependent water-related societal challenges. This has led to the emergence of fields such as socio-hydrology and hydrosocial research, which can be considered epistemological departures, as they perceive “water—and the systems within which it flows—as both social and natural” (Wesslink, Kooy, and Warner 2017, 2). However, socio-hydrology and hydrosocial research differ in their methodological designs and applications—the outcomes of their different disciplinary orientations and ideological affiliations. To contextualize hydrological science, socio-

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¹ The nine planetary boundaries include: climate change, ocean acidification, stratospheric ozone depletion, atmospheric aerosol loading, biogeochemical flows: interference with P and N cycles, global freshwater use, land-system change, rate of biodiversity loss and chemical pollution (Rockström *et al.* 2009).

² Problems are “wicked” when they are multi-layered, interconnected, difficult to define or delineate, cannot be solved with quick fixes or technical solutions, and keep reappearing time and again unless perceived as a composite whole and addressed at their roots (Rittel and Webber 1973).

hydrology often relies on quantitative or mathematical modelling to represent the water–human relationship. On the other hand, hydrosocial analysis aims to reveal how power operates in water–society connections, and how water shapes and is shaped by society (Lafaye de Micheaux and Mukherjee, *forthcoming*). However, despite the methodological and political challenges of transdisciplinarity (Wesselink, Kooy, and Wagner 2017), through which socio-hydrologists and hydrosocial researchers can actually come up with shared research designs and courses of action, water researchers are now ascribing value to “disciplinary trespassing” (Rusca and Baldassarre 2019). Drawing on their own research experience and expertise, Rusca and Baldassarre (2019) demonstrate the multiple ways in which different natural science and social science water research frameworks can converge and become compatible and complementary to each other. Reflecting on the significance of “reciprocal learning” for water researchers, Evers *et al.* (2017) have conceptualized a “pluralistic water research” approach that is “integrative and interdisciplinary” and which aims to “coherently and comprehensively integrate human-water dimensions”.

The South Asian water scene is huge and diverse, leading to the exploration and analysis of complex problems using natural science and social science approaches, such as socio-hydrology, environmental history, and political ecology (including hydrosocial studies).³ While transdisciplinarity is yet to emerge in India (with the exception of very recent large-scale projects that have brought hydrologists and social scientists together—for example, ATCHA and EqUIP), contemporary social science-based water research is limited to the analysis of power relations among multiple actors, much like the mainstream political ecology of water (Mukherjee 2020).⁴ This is problematic, as there is “something distinct to water, to water experiences and water knowledges in Asia” (Baghel, Stepan, and Hill 2017, 2). This special section advances alternative new epistemologies of water (NEW) within the South Asian—and particularly the Indian context.

In the opening article, “Knowledge Others, Others’ Knowledge”, Lahiri-Dutt clearly explains why NEW is imperative for the Global South. She

³ The socio-hydrological framework is still novel in the Indian context, with very few case studies to date (Wescoat 2013; Srinivasan 2015; Nüsser *et al.* 2019). A detailed historiography on water social science paradigms is available in Mukherjee (2018).

⁴ The ATCHA project (<https://www6.inrae.fr/atcha/Presentation>) combines an integrated biophysical model with a participatory approach that aims to help farming systems adapt to climate change in a network of experimental watersheds in Karnataka, India. The EU-India sponsored EqUIP Project (2019–2022), which aims to analyse “fluid governance” paradigms in the Rhone and Ganga Deltas, comprises an interdisciplinary, international team of geomorphologists, political ecologists, historians, cultural studies researchers, and critical physical geographers.

critically interrogates the hegemony of western epistemology, where water is commodified into “modern water” (Linton 2010) or “normal water” (Schmidt 2017), abstracted from social, political, and cultural dimensions. The author talks about the need to transcend a singular “way of knowing” water by recognizing alternative forms, and thus postulates “an anti-hegemonic ecology of knowledges” (p. 121). Based on her study of the lives of islanders “dancing with rivers” in Bengal, Lahiri-Dutt evolves her theoretical conviction, which finds strong manifestation in her arguments. With her expertise and strong grasp of ethno-theoretical discourse, Lahiri-Dutt discusses the need for, and potential of, feminist epistemologies using examples from global projects—such as the Sustainable Development Investment Portfolio (SDIP) at the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia—to provide directions through which gender can be integrated into the study of rivers and riverine communities.

Moreover, spatial diversities and specificities (like tropical-deltaic materialities), coupled with rich customary practices and traditions, underlie socio–water enmeshings that need to be unveiled, understood, documented, and analysed for both academic and policy interventions as well as the intersections between the two. Mukherjee and Ghosh apply the “hydrosocial” lens to the *chars* (riverine islands) of the Lower Ganga Basin in the Malda and Murshidabad districts, West Bengal, to capture the micro-realities of everyday life and livelihood dynamics in the “muddyscapes”. They question western knowledge of “solid” (land) and “liquid” (flowing waters) to formulate a “fluid epistemology” and enrich the “hydrosocial” through the proposition of the “hydro(sediment)social” that incorporates complex interactions between water, society, and mud. The article advances why and how it is imperative to rethink sediment beyond their physical-geomorphological existence and as social sites of interaction. It activates the agency of sediment by not only understanding it as an emblem of uncertainties and volatilities, but also as a zone of opportunity and possibility bestowed with rich ecosystem services and the collective resilience of the *choruas* (islanders; people inhabiting *chars*).

Sen, Unnikrishnan, and Nagendra’s article on “imperilled waterscapes” uses history and political ecology to provide a long-term narrative of social and ecological change in Bengaluru’s lake system, with a particular focus on Bellandur Lake, the largest lake in the city. The major systemic change that the article discusses is a rupture in the connectivity between lakes, which has caused a reversal in both the imagination and reality of the lake from a “flowing” to a “static” network of water. Using historical sources such as inscriptions, archival records, historical maps, oral history interviews, and

primary fieldwork spanning the past six years, the authors document urban waters and identify rapid urbanization as the main cause that led to these water bodies losing their connectivity and the reason for their physical transformation into stagnant, isolated pools of water in different parts of Bengaluru. The article familiarizes readers with ancient stories, myths, legends, and practices surrounding Bellandur Lake, and re-contextualizes water within social and cultural systems. Modern infrastructure, like piped water and sewage disposal systems, not only led to the drying up of these lakes and their transformation into sewage-filled water bodies, but also altered the cultural practices associated with them. The authors lament that protest and petition drives remain sporadic; isolated and compartmentalized attempts to restore particular lakes have failed as the significance of lakes as an interconnected system has already lost ground, leading to “a lack of systemic engagement with the dynamics of this complex social-ecological system” (p. 132). By making “invisible epistemologies of water visible again” (p. 133) through historical and ethnographic narratives, the authors emphasize the role of lakes as “systems” in augmenting urban environmental resilience.

NEW not only acknowledges the need to broaden and enrich the vista of Indian water research by unravelling multi-layered and interdependent historical and political complexities and cultural specificities, but it also introduces integrated frameworks through which this can be scientifically done. Combining political ecology and *mésologie*, Lafaye de Micheaux and Kull imagine a new “environmental geography of rivers” to capture how both the ideas and materialities of rivers operate in the contemporary social order. The article chronicles diverse ways of knowing rivers across historical conjectures, from antiquity through the Renaissance and to contemporary times. The authors demonstrate how post-modernist approaches emerging since the 1980s are a departure from the long-lasting modernist perspective. Post-modern scholars have revisited and reconceptualized the complex relations between objects and subjects and humans and non-humans, focussing on hybrids instead, with binaries and boundaries becoming dysfunctional. The post-modern moment facilitated “non-modern” ontological and epistemological ruptures, evident in contemporary water research frameworks like political ecology (more specifically the “hydrosocial”) and *mésologie*. While the political ecological perspective enables researchers to account for the *dialectical* and *internal* relation between water and society, *mésologie*, propounded by the French geo-philosopher Augustin Berque, focuses on the “milieu”, which is simultaneously physical, ecological, and based on human interpretation (Berque 2014). The authors argue that by integrating these two frameworks, emotions and attachments

towards rivers can be understood as embedded within the strategic field of power relations. They discuss the significance of applying “hydrocosmological” and “mesopolitical” lenses, draw our attention to case studies, and explain why and how Indian rivers—like the Ganga—offer the most appropriate context for analysis along these lines.

NEW also brings hydroculturality to the fore in an empirical manner through field realities and shows how the Indic perspective shapes our “pre-modern” (non-Western) water perceptions. DasGupta’s article on the Sundarbans deploys the water culture lens to underline the evolution of human history through the propulsion of religious water customs. DasGupta reflects on water-centric quotidian actualities through nuanced readings of oral histories collected from the field and examines their relation to the local religious literature. By analysing regional narratives and customary practices in relation to the local religious culture, as evident in the folklore and traditions of the Sundarbans Delta, the article explores cultural and historical imaginations surrounding water that influence—and, in turn, are determined by—the island archipelagos and their inhabitants. The application of the “hydrocultural” framework enables us to know and understand the multiple ways through which water and cultural practices have shaped each other historically; this provides an opportunity to rethink the aqua-centrism of communities at the margins of social development. Mukhopadhyay and Choudry’s article on “Indic hydro-epistemologies” explores the sacrality (and secrecy) of things revealed by water, i.e., visible, tangible gifts and assets, and things hidden in water, such as tactile experiences. It deliberately focuses on those sacred functions of water in the Indic traditions “that often escape our critical gaze” (p. 168). The authors analyse the limits of western theoretical frameworks, like Eliade’s “hierophany” or Taylor’s “sea spirituality”, to capture the complexity of Indic religious cultures, as “the spectrum of the sacred is bafflingly wide and all-pervasive” (p. 163). By drawing attention to the array of sacred things in Indic cultures that are both revealed by water and hidden in it—like the conch shell, *bana linga*, *svarnamukhi shila*, *shaligrama shila*, and petrified body parts of Goddess Sati—the authors contribute to the hydro-epistemology of sacred things, where water does not remain restricted as an *object* of worship, but engages in an active play with the very epistemes of sacrality.⁵

⁵ *Bana linga*, also known as *Svayambhu* (i.e. self-born) *Linga*, is an ellipsoid stone worshipped by Hindus. The stone symbolizes Lord Shiva, the supreme god of power in the Hindu Trinity (Brahma-Vishnu-Maheshwar). The stone is commonly found in the bed of the Narmada River in Madhya Pradesh, India. *Svarnamukhi shila* is the natural divine stone obtained from the Swarnamukhi River in Andhra Pradesh. And, *shaligrama shila*, collected

NEW in India aims to transcend the political to reach and move towards the plural by making invisible feedback loops—which are embedded in our rituals, belief systems, coping practices, and power hierarchies—visible. These short articles are appetizers and avenues, provoking fresh empirical investigations and methodological innovations that lead towards larger theoretical frameworks that can be applied at scale. NEW is also ambitious and politically committed to advancing theoretical understandings on water beyond academia through reciprocal and mutual learning among academic and “non-academic” sectors (like policy circles, civil society, user groups, and others) towards a just, democratic, and resilient transformation along challenging yet possible lines of transition from epistemology (or epistemic pluralities) to (multiple) axiology.

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