

Water as a Public Matter

Advancing Water Literacy

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Abstract: Even in countries long considered water-secure, challenges relating to water availability, water quality, and the consequences of increasingly extreme weather events such as droughts and heavy rainfall are now becoming evident. Together, these developments create the need for transformations across all levels of society. This generates new conflicts and calls for public debate. While public spheres are under pressure, we postulate that water literacy is required to manage these transformation tasks in a way that is consistent with sustainable development. We discuss the difficult conditions of today's public sphere and contrast this with the perspective of a pragmatist understanding of democracy. Building on this perspective, we conclude by proposing theses toward an encompassing conception of water literacy.

Keywords: democracy, hydrological extremes, pragmatism, socio-ecological conflicts, transdisciplinarity



In recent years, water has become an increasingly pressing issue even in countries previously considered to be rich in water resources such as Germany. Climate change, frequent extreme weather events, threats to the water balance, and increasing pollution are causing growing concern about ecological water regeneration, reliable disaster prevention, and securing a sustainable water supply in terms of both quantity and quality (e.g., BMUV 2023; EEA 2024; Madani 2026; UNESCO 2023, 2024; WBGU 2024). Issues such as these ignite and intensify conflicts over values, interests, justice, and technological usage (Lorenz 2024a). From an ecological *and* social perspective, there is a need for novel perspectives on water and new ways of dealing with it, both locally and globally. This task is described only very inadequately by the goal of achieving “broad social acceptance” of the changes necessary to ensure sustainable water infrastructures and management systems (BMUV 2023: 50, 67). Demands such as these seem to assume that there are solutions to water problems that only need to be accepted while they are implemented by (primarily technical) experts. Simply





imparting factual knowledge, or knowledge of ostensibly “pure facts,” is not enough for better involving citizens and stakeholders, because it does not automatically lead to changed decisions and actions. In contrast, we argue that it is necessary to overcome such simplistic notions of change—and the respective programs, campaigns, and policies. Instead, we propose a pervasive public and water literacy: The public sphere creates opportunities for democratic engagement with the new challenges, while water literacy refers to the ability to take the emerging problems and water issues into account and turn them into subjects of public debate. This is what we later refer to as the qualification of public debate and participation through water literacy. Our proposal is therefore to understand water literacy as the close intertwining of this ability—in individual everyday life, in positions of responsibility, and among collective actors—with public participation. We propose to consider water as a public matter that undoubtedly requires technical expertise, but nevertheless is linked to a generally shared understanding of ecological and societal contexts and to problem-oriented public opinion and decision-making on the sustainable use and protection of water. Our aim with this article is to encourage new reflection on the content, significance, and opportunities of water literacy as a basis for public debate on today’s water challenges.

Routines and Extremes of Water

By addressing water as a public issue, we are expanding the focus on “water between extremes.”¹ We are not only concerned with too much, too little, or too polluted water and its consequences in a hydrological or toxicological sense. Instead, we begin with daily routines and assumptions on water in society. These are important because action becomes possible only when not every situation is perceived as requiring a new decision. However, everyday routines can also blind us to dangers: Routines do not let us respond to changing socio-ecological conditions and question unjust circumstances, dominant interests, and cultural patterns of interpretation. Only the onset of disasters—be it flooding or a tap that suddenly stops running—forcibly ends the ever-risky certainties (Clausen 2003). By moving beyond our routine everyday perspective, a wide spectrum of water phenomena becomes perceivable, opening up possibilities for reshaping our use of water. It is precisely in this sense that water becomes interesting *between* the extremes. One extreme is the matter-of-factness of routinely used water, which does not become



a public issue because it is not considered at all or only in fixed patterns. It is simply there and is lost in the habits of everyday life and established infrastructures—it flows out of the tap and disappears into the sink or through the manhole covers. The other extreme is represented by the overwhelming images of catastrophic events that spread fear, leave people struck dumb, and force those affected to save what they can. *Water as a public issue* must navigate between *these* extremes or overcome such “extreme positions” respectively. Only then does water become an issue that can be problematized and publicly debated. How can this aim be achieved, promoted, and put into practice through water literacy?

To date, dealing with water issues has primarily been left to experts in technology and administration, with social science perspectives playing only a marginal role. However, since the problems are not only technical in nature and typically affect various social groups and individuals, technical solutions alone are insufficient. The divergence between different areas of expertise and the public’s concerns typically becomes apparent only in cases of conflict, for example, when experts are surprised by resistance to their technically well-designed solutions in public debates. Over the past two decades, several social and cultural studies have examined various aspects of the interaction between water and society (Dietzsch 2021; Krueger and Alba 2022; Schulz and Gros 2024). This indicates that, in addition to the undoubtedly important scientific findings and technical expertise, numerous other social perspectives and forms of participation are needed to meet the new challenges associated with water. We address this need by discussing water as a public issue of general interest that requires democratic treatment. The following considerations are based on the assumption that water literacy is essential for these publicly controversial negotiations. Before defining this concept in more detail, let us first turn our attention to the public sphere.

Publicness, Democracy, and Water

Discussing water as a public issue must address not only water itself, but also the current state of the public sphere. This highlights the problem that democratic public spheres themselves are under pressure. “Post-democratic” conditions (Crouch 2020) and social inequalities undermine access to democratic participation. Destructive populist “flooding” of opinion and decision-making, made possible in part by



the structure and commercialization of digital global media, threatens the culture of public debate. While expectations for digitization initially rested on the belief that its networking capabilities would expand the opportunities for public communication, awareness of the potential dangers posed by digital media and AI has long since grown (e.g., Habermas 2023). The possibilities for public deliberation and democratic integration are undermined by the logic of platforms and their algorithms, the market power of a few corporations, the fragmentation of digital forums and the blurring of private and public communication, pressure on quality journalism, and the unfiltered spread of fake news.

Diagnoses of a public sphere at risk have been present in the social sciences since well before the digitization processes at the beginning of the 21st century. They ranged from the capitalist takeover of the public sphere and its cultural decline to the question of whether the complexity achieved by industrial societies could be managed in any way other than through expertocracy (Habermas 1989; Lippmann 1925; Sennett 1976). Such crisis diagnoses are countered by voices calling for the further development of democracies. A century ago, John Dewey formulated ideas for a democracy based on public controversy, which gained renewed interest in philosophical and social science discourse around the year 2000 (Dewey 1991; e.g., Joas 2000). This forms the basis for more recent considerations on topics such as democratized ecology, the democratization of consumer society, and “open” urban development (Lamla 2013; Latour 2004a; Lorenz 2024b; Sennett 2018). Democracy primarily appears here as a way of life, as “the idea of community life itself” (Dewey 1991: 148), and the public plays a central part in it. For Dewey, public spheres arise from newly emerging issues that result from indirect consequences of actions; that is, people are affected by social developments to which they themselves have not (directly) contributed. In the case of water, for example, this can mean that agricultural successes and industrial innovations lead to PFAS-contaminated waters and nitrate inputs into public drinking water reservoirs; the development of residential and transport areas increases the risk of flooding during heavy rainfall; the energy-intensive increase in prosperity contributes to climate change and can cause increased regional droughts; the reduction in existing water resources due to climate change and pollution can lead to new conflicts over water usage and injustices. According to Dewey’s theory, the formation of collective awareness and public debate on emerging challenges is the initial step in the democratic process. The assumption is that established regulations cannot adequately address new problems. Therefore, new regulations and institutionalizations must be



created from the new issues and the public spheres that are forming around them. Bruno Latour's work follows on from this. His conception of democracy focuses first and foremost on the question of "how to make things public" (Latour 2005)—such as water. The fundamental prerequisite for this is a different understanding of water that means not only a scientific and technical understanding, but also a sociocultural and social science-based understanding. For Bruno Latour, "thing" does not refer to water as a mere physical object. In older historical uses of the word, it is still understandable that the thing refers to the negotiation of disputes—in the Nordic Thing, for example, people come together to discuss contentious issues. While Latour (2004b) refers to "matters of concern," Ivan Illich (1985) had already thought about water as "stuff" in a similar way. Considering that literature, stories, and even dreams are also made up of "stuff," the matter of water is only very inadequately described by its chemical properties—it is not just H₂O. More than just physical materiality, water can consist of very different stuff, each with its own history. The baptismal water is different from water of the mill stream, and the refreshing mountain spring from that of the fire pond. Each of these waters is determined by its social function and cultural meaning as well, which originate in experiences of spirituality, human needs, and collective action in history.

In other words, the thing or stuff that public affairs are made of always appears as a matter of concern to the public that gathers around it. And these matters of concern have their own histories and are shaped by the constellation of all entities involved; specifically they include, rather than exclude, the interpretations and actions of those involved. The physical properties of water are by no means denied from this perspective; these are primarily the domain of science and technology. However, which of these properties are relevant and in what way only becomes apparent in the context of the controversies surrounding the issues under negotiation. This is precisely why negotiations on current water issues cannot be decided (solely) on the basis of scientific and technical considerations—whether they concern flood protection, water quality, the construction of dams, the extraction of groundwater or mineral water, access to rivers and lakes, irrigation, or drainage, and so on.

It is challenging to illustrate such a political process with an example, as any concrete instance fails to adequately reflect the fundamental nature of this pragmatist perspective. This is because the model claims to describe democratic processes better than concepts that use a fixed set of institutions to determine what democracy is. This does not mean



that democracy has to be reinvented every time a problem arises, but it does require openness to far-reaching institutional change when the problem at hand demands it. A very general example is the emergence of ecological problems since the 1960s and 1970s. Over the decades, numerous new actors, organizations, and institutions have emerged at all levels—local, federal, national, and international. While they have achieved some success, they are far from providing comprehensive solutions to the ecological crisis. With this in mind, a more concrete example involving water can be considered. This pertains to the worldwide privatization efforts in drinking water supply and wastewater disposal since the 1990s—and the subsequent remunicipalization in some cases. In Germany, for example, the water supply in Berlin was partially privatized in 1999 and, following a referendum in 2011, it was remunicipalized in 2013 at great expense. The civil society initiative Berliner Wassertisch (Berlin Water Table) was founded back in 2006 to campaign for remunicipalization. It made use of the institutional options available (courts, referenda), but first had to raise public awareness of the Berlin water. Its activities continued after 2013, in particular with the establishment of a new institution, the Wasserrat (Water Board). The board aims to ensure that civil society and public concerns regarding water supply are sustainably integrated in supply decisions.

This example demonstrates that water is more than a mere physical substance. The technical water supply may be more or less secure, but the decisive “thing” here was that water was made a public issue in order to debate what ownership structures and control mechanisms should characterize the city’s water.

In such societal negotiation processes, in which the sciences also participate, the diversity of the interrelationships and consequences of water problems and those involved or affected must be first made publicly visible. This allows the disputes surrounding water to be developed and examined in different ways, and possible new perspectives and approaches to be tested. Only then can they be incorporated into innovative institutions and regulations in a promising and sustainable manner, be anchored in technology, and be adopted in new practices.

The emphasis on new solutions should not obscure the fact that interpretations of water and ways of dealing with it have long been established and effective for water supply and sewage—but can no longer be sustained when new challenges (such as climate change or pollution) need to be overcome. Since water supply, water regeneration, and disaster control are already largely routine and regulated (at the local, national, European, and global levels), any reorientation must



consider their numerous economic and regulatory institutionalized as well as culturally practiced contexts. Democratic public spheres and political cultures, institutions, and procedural rules are also historically established (Habermas 1996). They safeguard the democratic order and require participation and further development in order to ensure democracy's long-term viability. Habits and interests, technological path dependencies, structures of ownership, and positions of power become matters of concern in this context.

Water Literacy as Qualification of Public Participation

In view of the threats to democratic public spheres, public negotiations on water require, not least, qualified contributions in order to meet the social and ecological challenges posed by water. We discuss such qualifications for public deliberation and participation as *water literacy*. To promote water literacy, dramatic portrayals of the potential for disaster or simple information campaigns for individual water consumers are not enough. Such approaches pit a knowledgeable, informed side against an ignorant side that needs to be informed. Instead, water as a public issue requires discursive, transdisciplinary exchange in which roles are not predetermined. While technical experts possess specific knowledge that is undoubtedly necessary, this does not make them authorities on sociocultural, political, and practical everyday water issues. Consequently, they do not have a privileged voice in the democratic discourse on social goals and values.

Water literacy is not limited to factual knowledge only, but also aims to change the way we interact with water. In this sense, practical experiences with water can contribute to water literacy just as much as a textbook, and perhaps even more sustainably. Learning to swim (Düffel 2000) can be one such opportunity, as can access to nature conservation, water playgrounds, participation in fire or water rescue services, taste perceptions of water, urban design, gardening, (therapeutic) bathing, and many more. These diverse practices and experiences underscore the multifaceted nature of water literacy, a concept that has garnered some international attention over the years (McCarroll and Hamann 2020) but is still not widely adopted. The concept of literacy originally stems from language development (reading/writing skills) (Durden-Myers et al. 2022) but is now used in many different contexts. Currently, literacy extends to domains such as financial, health, emotional, civic, scientific, media, digital, or data. Apart from explicitly



critical approaches (Sander 2024), the original connection between literacy and human rights as well as social participation (literacy as empowerment) is often lost in favor of a more instrumentally understood competence orientation. Moreover, the focus is typically on individuals. According to a literature review that became a central reference for subsequent publications and in which the authors differentiate between various types of knowledge relating to “water knowledge, attitudes, and behaviors,” only 2 of 26 definitions of water literacy explicitly include “collective action” (McCarroll and Hamann 2020: 9), which is essential for public participation. Civil society and activist initiatives that use the term “water literacy” often hope for a rapid transition from expert knowledge to action for the sustainable use of water resources. However, this transition is usually neither well understood nor specifically conceptualized. Academic work sometimes goes beyond mere knowledge transfer, even though studies often deal with the assessment of knowledge bases of different social groups (e.g., Lally and Forbes 2020; Saraswaty et al. 2022). Some studies observe a positive correlation between factual water knowledge, attitudes, and behavior (e.g., Tian et al. 2023). Typically, knowledge transfer, mostly in schools, is targeted at sustainable water use (e.g., Cole et al. 2024; Mostacedo-Marasovic et al. 2022). David C. Owens and colleagues (2020) explicitly call for individual consideration of different social perspectives in understanding water problems. Similarly, Helen Joanna Boon (2024) emphasizes the concept of the hydrosocial water cycle—rather than just the physical cycle—to understand the social determinants of water availability and quality. Our contribution to these existing concepts is the assertion that, while knowledge, personal skills, and practical abilities are crucial, participation, negotiation, and deliberation in problem-related public controversies are equally essential.

In addition to the problem focus introduced (Dewey 1991), accessibility via language plays an important role in the constitution of publics (Schiewe 2004). In this respect, language communities, and thus often nation-state publics, can develop their own distinctive characteristics, even if, as is evident in the case of water, the influence of global water policies and governance is increasing (Dobner 2010). Although water raises global problems in many respects, these can still be negotiated within different publics, as long as relevant global facets are present.

The challenge is to increase public understanding of water-related issues and to draw sustainable, practical conclusions from this public debate. Given the wide variety of water issues, it is evident that there cannot be a universal approach to water literacy. For instance, the



infrastructures for drinking water supply and wastewater collection and treatment differ significantly, and there are overlaps but also differences regarding energy production infrastructures. Other uses include irrigation, transport and mobility, fishing, cleaning, health, production, various types of cooling, firefighting water, but also recreation and tourism, symbolic communications, and practices in religion, politics, and aesthetics. Where water is not directly utilized, it may be removed or prevented from flowing—in drainage, wastewater disposal, or flood protection. In nature conservation, water may need to be safeguarded from use. This list points out that there are very different potential problems that may only be loosely connected under the umbrella term “water.” Such diversity necessitates differentiated concepts and approaches to water literacy, which we will explore in the following section.

Theses on Water Literacy

Water literacy encompasses expert knowledge about water and its uses. It also includes an understanding of the cultural significance of water, from its usefulness and refreshing and aesthetic qualities to its potentially dangerous aspects. This requires practical experience with water in various contexts, from playful and recreational activities to skills for protecting oneself from water. In public negotiations on understanding and achieving new ways of dealing with water in the face of today's challenges, democratically demanding and problem-oriented water literacy aims to:

- question established assumptions and conflicts of interest regarding water,
- create awareness and sensitivity for the technical, economic, and political structures of human–nature relationships in today's water use, as well as for thinking in socio-ecological contexts and sustainable time dimensions,
- achieve everyday action and strengthen its public relevance without being misunderstood as a simplistic appeal to individual responsibility,
- reflectively address culturally anchored symbolic meanings of water, initiate cross-cultural dialogues, and encourage media discourse,
- promote civil society's engagement on water issues, improved government regulations, and business initiatives focused on public concerns,



- contribute scientific expertise to the advancement of public affairs relating to water in a transdisciplinary manner.

Such well-founded water literacy will enable the translation of public renegotiations—such as those concerning water infrastructure, water management, or flood protection—into public processes of opinion formation as well as into new institutional arrangements and everyday practices. To this end, existing ideas can be built upon, ranging from citizen-designed civil protection and disaster control to transdisciplinary research concepts and diverse participation procedures (Dombrowsky 1992; Lawrence et al. 2022; Lorenz 2022). Water is one of the central topics of socio-ecological transformation; it is inherently conflict-prone and often intertwined with other challenges such as climate change, biodiversity, and (planetary) health. Such thematic association encourages broader perspectives and cooperation among stakeholders in order to address water as a public issue. In this way, the idea of water literacy that has been developed here can make valuable contributions to sustainable transformation processes that extend far beyond water itself.

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Note

1. This text is based on outcomes of the transdisciplinary symposium “Wasser als öffentliche Angelegenheit: Water Literacy” (“Water as a Public Matter: Water Literacy”), part of the themed week “Water between Extremes” organized by the Volkswagen Foundation in Hannover, Germany, from October 9 to 11, 2024.

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