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Design-Based Solutions for Water Challenges: The Value Case Approach

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The concept of values has become increasingly important in many fields, including water management, heritage preservation and design. Politicians, economists, water managers, heritage specialists and designers often consider values as guiding principles for their interventions. While water management has traditionally focused on technological and economic values, in recent decades there has been growing recognition of the significance of socio-cultural aspects. This shift is evident in initiatives like the United Nation’s Valuing Water Initiative, which recognized five “Valuing Water Principles” as guidelines for incorporating the values associated with water in decision-making. However, how to define and implement these values in particular contexts has not yet been clearly established, with approaches varying across disciplines and fields. Understanding the complex interdependencies and values characterizing each water system can help develop a strategy for integrated management of water with the goal of sustainable development with a long-term perspective and a design focus.

Keywords: values, value case approach, water values, ecosystem thinking, long-term perspective



KEY THEMES



< Fig. 1 Purification rite at the Tirta Empul Temple, Bali, Indonesia (Source: Jorge Láscar 2023, CC BY-2.0, via Wikimedia Commons).

Introduction

Today's water challenges are complex and multifaceted. The way we respond to these challenges depends on the values embraced by various stakeholders, including politicians, economists and citizens, whose needs and expectations do not always align. Over time, different actors have shaped the flows and practices of water systems spatially, institutionally and culturally, bringing forward certain values instead of others, creating path dependencies and affecting the present and future of water systems. Ethical standards, know-how, belief systems and material constraints have shaped responses to past and contemporary water challenges. These responses range from technological and economic interventions to a focus on what seems most socially just and culturally inclusive. Consider an example of competing values: the needs and interests of stakeholders who make a living from river shipping may be opposed to those of people who wish to swim in the river or those of the animals and plants in the ecosystem.

After more than a century of technology- and economy-focused approaches in water management, there is a strong need for solutions that respond to multiple challenges at the same time and trigger positive ripple effects at various spatial scales – from neighborhood to city and territory. The necessity to overcome sectoral approaches is recognized by scholars in diverse fields. Rob Tulder, professor of international business and society management, and his colleague Eveline van Mil have argued that value propositions “of companies need broadening, from short-term ‘shareholder value’ to one that includes all (present and future) stakeholder interests” (Tulder and van Mil 2023, 419). Such an approach can help in designing more inclusive and sustainable programs, projects and systems to prevent negative side effects and to strategically create direct and

indirect positive outcomes for the public and the environment (Tulder and van Mil 2023).

This approach is also relevant for the water sector, as the quality, availability of and access to water directly impact economic development, social justice, health, education and all other areas of sustainable development. Gilbert Hougbo (2023), chair of UN-Water, puts it bluntly: “The lack of progress on water and sanitation is jeopardizing the entire 2030 Agenda for Sustainable Development. [...] Just as negative water-related consequences flow through every major challenge, so too would positive water-related solutions have an impact on every social, economic and environmental challenge.” Mono-directional strategies are no longer sufficient and new approaches should consider border ecosystem thinking. In this context, the SDGs can be a catalyst for addressing “wicked problems,” that is, complex and difficult-to-solve issues that have interconnected causes and no clear solution (Tulder and van Mil 2023). As Sandra Pellegrom (2023), the Dutch SDGs coordinator, has pointed out, the SDGs function as a system, and there will have to be a balance among different goals. A careful understanding of which values shape stakeholders’ logic and interests can shed light on solutions able to address multiple needs and create positive ripple effects for all parties in the context of intervention.

How to define and assess values, including in the water management field, remains an open question (Hein et al. 2023), even as many international institutions and programs have promoted the idea of valuing water, arguing there is a need to consider water to be more than its economic value. For instance, both the World Bank and the International Water Resource Program (IWRM) propose a method of valuing water in their guidelines (UNEP n.d.; IWRM Action Hub n.d.; World Bank n.d.). The 2018 UN High-Level

Panel on Water defined five “Valuing Water Principles,” the first of which highlights a need to “recognize and embrace water’s multiple values” (UN-Water 2021). Yet, the suggestions provided by the IWRM and World Bank still treat water as just a resource (Orlove and Caton 2010), an approach that contradicts the UN General Assembly’s recognition of water as a human right since 2010. Organizations like UNESCO link values to education as evidenced in slogans like UNESCO’s “Change minds, not the climate” that speak to human agency in structural changes (UNESCO 2016). However, there is still little clarity on how to investigate and leverage these values that are recognized as linked to collective and individual interests, to social and cultural practices that change in space and time, and to human rights (Orlove and Caton 2010; Porta and Wolf 2023).

Values beyond the Economic

As a noun or as a verb, the term value has several meanings (Britannica Dictionary n.d.). Yet, the underlying concept is the same. As anthropologist David Graeber has argued, “The fact that we use the same word to describe the benefits and virtues of a commodity for sale on the market [...] and our ideas about what is ultimately important in life [...], is not a coincidence. There is some hidden level where both come down to the same thing” (Graeber 2013, 244). The “hidden level” lies in the conscious or unconscious action of attributing qualities, assessing and estimating. Writing decades before Graeber, Clyde Kluckhohn (1951) provided a comprehensive definition of values as individual or societal conceptions that shape our perspectives and guide our choices according to material constraints and socio-cultural ways in which our spaces and practices are organized. For instance, achieving economic outcomes can be the conception behind our actions and, therefore, the value guiding

the choices we make. On the other hand, increasing ecological justice might be the value guiding a project, and the project will then involve actions that might be less financially profitable but in line with what is considered most “desirable” or just for people, plants, animals and the broader environment. Values shape our thinking and decision-making; however, individuals and groups often hold multiple, sometimes conflicting, values. Similarly, objects or systems of objects can embody a diverse range of values. Sometimes values are determined by external factors, like the price of water at a particular time and place; other times, evaluations are intrinsic to our way of understanding and engaging with water and water bodies, which, in Maori culture, would be spiritually, and for tourists, aesthetically.

How we live with water results from technology, lifestyles and values at a specific point in time; heritage, which results from past practices, gives insight into values and value dynamics over time. What we value as a community at large and choose to preserve is captured in institutional definitions of heritage, notably UNESCO’s World Heritage Convention of 1972 and subsequent documents. UNESCO distinguishes between natural, cultural and mixed properties of “outstanding universal value” (UNESCO 1972), as well as intangible heritage (under the Convention for the Safeguarding of the Intangible Cultural Heritage 2003). These are deemed worthy of special protection from the dangers that increasingly threaten them. Note that the definition of Outstanding Universal Value assumes there are values that are universally shared. Even though conceptions of what is valuable and desirable change along with societies, the decisions taken and the (infra) structures created remain, creating legacies and path dependencies affecting current practices, built landscapes, and ways to engage with water. In this sense, historical and heritage analysis become extremely important not only to under-

stand what dynamics and driving forces have shaped current situations – and created current challenges – but also what values were handed down to future generations. In the context of water, the combination of tangible structures and intangible practices – ranging from dams to praxis in water management – inherited through time represents the water heritage of societies – even if it is not officially recognized.

To summarize, values are *multiple*; different actors are likely to have different values because values are *situational*; they generate from everyday experiences, ideologies, interests and needs. Furthermore, values are *hierarchical*: people prioritize certain outcomes and actions above others by conceiving something as more right or appropriate than something else (Robbins and Sommerschuh 2016). Thus, values become intrinsically *political*, as certain perspectives will be considered more appropriate than others according to actors' ideologies (DuBois and Salas 2021). Values are also *dynamic*: they evolve as societal preferences, technologies, politics and economic conditions change. Finally, values are *embedded*: they continue to shape us through the built environment, the institutions and the practices established in the past.

Value-Based Design

The values we inherit and the ones we adopt to design solutions and interventions will create the heritage of the future. Values are often tacit and embedded in the design process and the values brought forward with interventions are the ones of decision makers, varying according to personal, professional and socio-cultural preferences and ideologies. For instance, the water meter, an instrument to monitor households' use of water, has been used by South African policymakers to encourage citizens to

adopt a more responsible and calculated use of water and to reform the practices of water users and make them the more desirable ones (Von Schnitzler 2008). This particular water infrastructure, the water meter, had both technical and political purposes and ultimately was used to nudge citizens to change their behavior, therefore it also had social values (Larkin 2013).

Architectural researcher Elise Van Dooren (2020) argues that the values driving the logic and design of interventions need to come to the surface in the process of creation and preparation, to be able to discuss them properly. In line with the arguments of David Mosse (2004), expert in policy and development strategy analysis, we propose that relevant stakeholders need to recognize values and interests and they need to translate and broker them in order to implement them in participatory deliberation processes as the foundation of every project. To implement value-based approaches, it is necessary to first identify the values that are embedded in the natural and/or built spaces and in the imaginaries and practices of local people and institutions (Hein et al. 2021). Only then it becomes possible to make these conceptions intelligible for various stakeholders and start processes of co-production to arrive at shared objectives and create added value.

Climate change is transforming water systems and landscapes with an increase in droughts and flooding. Urban areas are sinking, and houses built to provide comfort in arid climates must adapt to heavy rainfalls. We must decide which values will guide future decisions, how to design and adapt our built environment, utilizing already accumulated knowledge and history to develop sustainable practices and equip ourselves with tools to protect shared heritage. If we agree that values are key to designing the future, we need new methodologies to help stakeholders discuss and align their respective

perspectives and develop shared values. We propose to go beyond the traditional business case and develop a value case that acknowledges long-term perspectives, system analysis and ecosystem thinking. We have, therefore, developed and tested a value case approach to leverage the multiple values associated with water and heritage for sustainable development.

Water Systems Design: A Value Case Approach to Solving Water Challenges

Leveraging water values to create sustainable solutions to current challenges and to trigger shared positive externalities in the context of intervention requires analytical tools and a comprehensive framework to guide the exploration of their multiple dimensions. On the one hand, such a framework is based on acknowledging the impacts of long-term developments and path dependencies and the different functions and practices associated with the spaces and institutions composing, surrounding and managing water systems. On the other hand, it calls for the careful analysis of the multi-scalar connections characterizing the network of actors, goods and flows that tie water systems to their localities and broader territories. The value case approach aims to leverage existing and potential connections, creating synergies among the different functions, spaces and actors related to the water system. In this way it is possible to account for different values surrounding water systems, reconcile conflicting ones and open the way to shared governance and collaboration among stakeholders (Sorensen 2015, 2017; Jansen and Hein 2023).

This framework has served as a foundation for the “value case approach” developed by a team from the UNESCO Chair Water, Ports and Historic Cities under the leadership of Carola Hein.

This approach aims to apply system analysis and multi-scalar thinking to water systems to create solutions that can foster the creation of added values for local contexts and ecosystems. It is based on careful analysis of the historical developments, spatial configuration, multi-scalar material, and social and cultural connections between actors, institutions, infrastructures and territories.

The UNESCO Chair team tested the value case approach through the professional online course “Water Systems Design: Learning from the Past for Resilient Water Futures.” Methods and tools such as the Historic Urban Landscape (HUL) Quick Scan Method, the World Inventory of the Global Network of Water Museums, and the Urban Planning and Development Agency of the Flanders-Dunkirk Region’s Canvas (or Toiles) guided the learners’ analysis of the water system of their choice, its challenges and multiple values (Damayanti et al. 2022; Eulisse 2023; Vereecke and Deveycx 2022).

Learners explored water challenge(s) embedded in their multi-scalar ecosystem and reflected on the different actors relating to them. Through a series of design steps, learners leveraged these insights into a mission and vision – their value case – to solve their respective water challenges while targeting multiple sectors of society, the economy and the environment. This resulted in value cases that, for example, addressed the lack of water awareness and education, especially in youth, by proposing to transform existing water towers into “watermarks,” improving their visibility and the public space surrounding them (Manziona 2024). By applying the value case approach, learners combined long-term thinking with context-sensitive planning to propose interventions able to add value for multiple actors rather than a sectoral solution targeting single water challenges.

Conclusions

The UNESCO Chair Water, Ports and Historic Cities posits that addressing current challenges in the water sector can benefit from a more complex value-based approach. To tackle multifaceted challenges, such as those inherent in water systems, we need to address tacit and implicit knowledge and values. Designing for water values entails strategic spatial and temporal planning, bridging societal principles with specific localities. Values need to be identified and visualized from the onset to be able to suitably involve all stakeholders, and these values have to be evaluated and questioned through multiple feedback loops.

The value case approach provides tools and frameworks to navigate this complexity, analyze water systems and plan value-based solutions based on long-term, multi-scalar and ecosystem thinking. Social science and humanities-based approaches and design methodologies can support these efforts. This approach helps understand legacies and path dependencies in water systems and structure projects to address multiple SDGs generating positive ripple effects across the many societal sectors related to water. The value case goes beyond the immediate task at hand to leverage water planning for the rejuvenation of contexts and ecosystems. It can be applied by public institutions or companies seeking a nexus approach to corporate sustainability aimed at creating shared value. The value case approach can complement and enrich technological and economic approaches by acknowledging the impact of long-term development, multiple stakeholders and fixities and flows at multiple scales.

Policy Recommendations

- Conceptualize and test values; develop methods to activate them.
- Consider water systems as a multilayered ecosystem composed of infrastructures, institutions, practices, people and non-human entities.
- Plan interventions respecting local cultures and social practices, which can be investigated through concepts like values; integrate them into deliberation and design processes.

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