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Valuing water: a difficult but crucial step towards greater water justice

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KEY MESSAGE

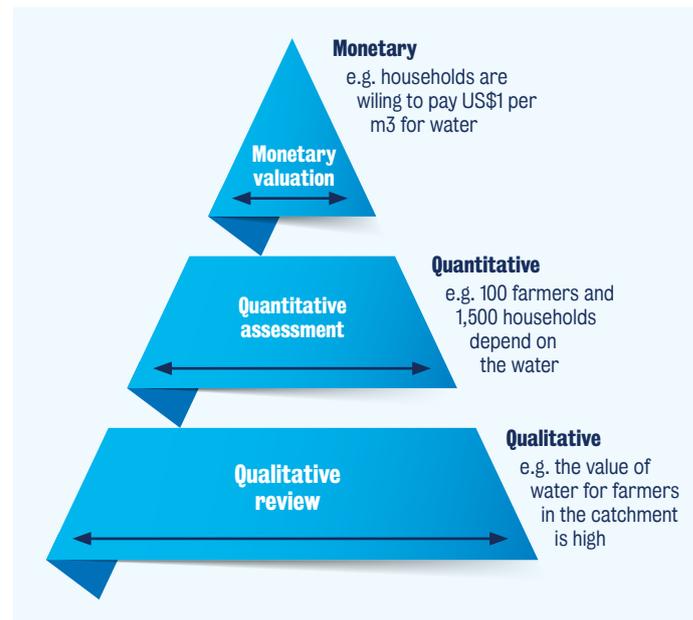
What is the total value of water? Water is a unique resource that carries multiple benefits and values. Some of these can be estimated through their 'financial' contributions in a market economy. Other benefits that are not traded in markets require a different approach to quantify the 'non-market' value of water. It is only by understanding both sets of benefits that we can adequately measure, and protect, the total value of water.

A POOR TRACK RECORD OF VALUING WATER

Water resources across the world are being impacted, in quality and quantity, by multiple sectors through excessive withdrawals or pollution. For instance, in the Vaal, part of the Orange–Senqu river basin in South Africa, agricultural run-off and uncontrolled sewage discharge paired with activities of resident extractive industries and power stations have led to the river's water quality being ranked worst in the country despite its contributions to Gauteng's economy, South Africa's and the region's economic powerhouse.¹ In other cases, progressive deterioration of water quality – caused by, for example, intensified use of agrochemicals – may also lead to water scarcity, reducing available quantities of safe and accessible water resources.² This is the case in Australia where high nutrient loads in water-related ecosystems (associated primarily with agriculture) costs US\$116–155 million annually, including through major disruptions to livestock and urban water supplies.³

However, the 'true' value of water cannot be defined purely for its impact on the market economy. When water resources are impacted, ecosystem services – the conditions and processes through which ecosystems generate, or help to generate, human-related benefits – change. Consequently, the values and benefits humans derive from such ecosystem services also change.⁴ Water-related ecosystem services can be affected by myriad factors, particularly overextraction, land-use intensification and climate change.⁵ For example, when investigating the Miyun Reservoir, China, it was found that land-use change has been a major driving force in the reduction of water

Figure 1: Hierarchy of water valuation approaches.



Source: UN Water 2021: 83⁴.

Figure 2: The Orange River flowing in South Africa, part of the Orange–Senqu river basin.



Source: "The Orange River in South Africa" by NASA Johnson is licensed under CC BY-NC-ND 2.0. <https://www.flickr.com/photos/29988733@N04/49689969473>.

yield from the basin, Beijing's most important source for drinking water.⁶ Despite this, efforts are being made to restore and protect the health of water-related ecosystems. Some of these changes, whether they imply benefits or damages, can be quantified in financial terms with relative ease. However, other sets of values, such as those associated with culture or wellbeing, are harder to quantify.

So far, decision-makers have fallen short of valuing water in its entirety. They need to account for the full range of market and non-market values associated with water as well as how they are impacted by multiple drivers and pressures. This has proved difficult, however, and has been compounded by various stakeholder groups' differing priorities regarding water values, as well as varying conceptions of what 'value' means, how it should be measured and the appropriate metrics for its expression.⁴

Despite the mounting evidence pointing to the importance of socio-cultural water values, Sustainable Development Goal 6 ('water for all') is still narrowly focused on water for drinking and hygiene purposes. While ecosystem health is acknowledged (Target 6.6), SDG 6 indicators account for it only in superficial ways (for example, there is no metric concerned with biodiversity). A gap remains as well regarding values associated with adequate water access, such as mental health, spiritual wellbeing and emotional balance.⁴

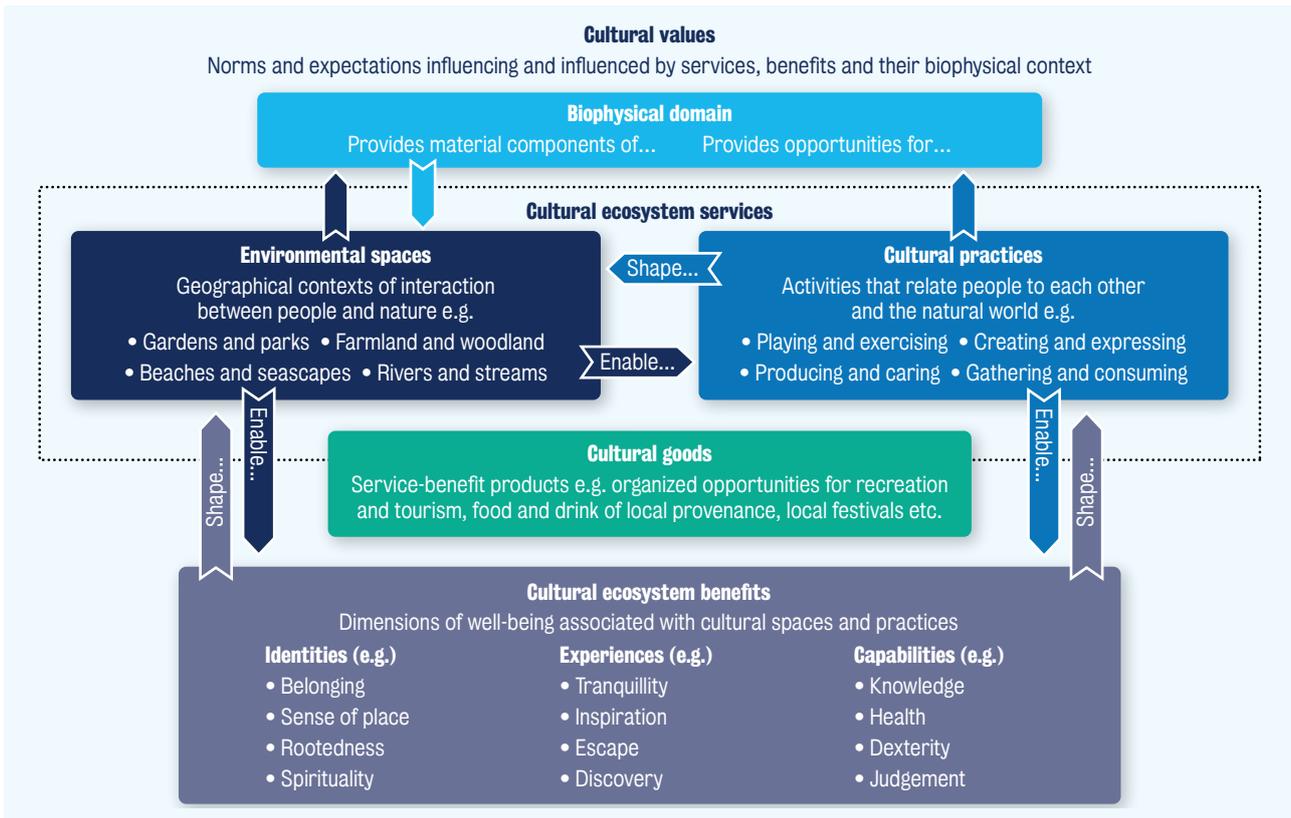
There is an urgent need to tackle the challenge of accounting for the total value of water: its success would be fundamental for the safeguarding of equity and environmental justice principles. This is particularly important in situations where disparities in water access result in greater social and economic inequalities, including health and education.

E-FLOW VALUATIONS: FROM THE SIDE-LINES TO THE FORE

To more holistically account for the total value of water, it is necessary to consider the importance of valuing ecosystems. This requires viewing water-related ecosystems not only as providers of water resources, but to take the significant contributions to human wellbeing and flows of services over time into account, upon which societies depend.⁷ From a policy perspective, paying greater attention to the environment–water relationship necessitates improving valuation methods as well as mechanisms facilitating their incorporation into improved decision-making frameworks.⁴

One such mode of valuation is the consideration of specific flow regimes in rivers, otherwise known as environmental flows (e-flows). E-flows "describe the quantity, timing, and quality of freshwater flows and levels necessary to sustain aquatic ecosystems, which, in turn, support

Figure 3: A conceptual framework for cultural ecosystem services.



Source: UN Water 2021: 100⁷.

human cultures, economies, sustainable livelihoods and wellbeing”⁸, and stress the interdisciplinary nature of eco-hydrological and social sciences, enhancing consideration and integration of ecological and sociocultural matters. Evolving in response to the rapid loss of water-related ecosystems globally⁹, e-flows, when effectively implemented, enhance market accommodation of environmental water needs, creating opportunities to shift water back to the environment while still meeting urban water demands or promoting agricultural productivity.⁴

The importance of e-flows has been gaining recognition globally, and numerous countries and environmental organisations have subsequently adopted e-flow provisions into water policies, allocation regimes, and water infrastructure design and operation systems. However, successful implementation on the ground has often been limited.

Recent research showed that even in river basins with progressive approaches to e-flows and protecting water-related ecosystems generally, such as the prior-mentioned Orange–Senqu river basin in Southern Africa, institutional barriers are significant. It was found that despite an advanced understanding of e-flows and enabling policies and legislation, ineffective implementing institutions and a complex socio-economic regional context have limited the realisation of the final steps of e-flow implementation in many parts of the basin.¹

Further action such as increased finance, enhanced understanding of regional contextual factors influencing e-flow implementation, more nuanced and integrated stakeholder assessments, and institutional reform and capacity building are needed to ensure water is valued more holistically. Progress in all of these areas, however, hinges eventually on political and societal willingness to appreciate the value of water-related ecosystems and consequently protect them adequately – which are largely lacking.

HOW TO ACCOUNT FOR SOCIO-CULTURAL WATER VALUES

As well as increased recognition regarding the importance of e-flows, calls for greater consideration of cultural, recreational and spiritual values of water are also gaining traction.⁴ There is a growing body of evidence identifying and quantifying water’s socio-cultural values. This knowledge can be effective to inform water policies, including, for example, benefit-cost analysis. However, a significant knowledge gap remains in relation to socio-cultural water values held by Indigenous peoples. Importantly, best-practice and relevant ethical frameworks should be followed when trying to quantify environmental impacts that affect Indigenous peoples’ values, including those associated with water resources.¹⁰ Without adequate consideration of the complex water values of Indigenous peoples, as well as other groups,

water policies will inevitably suffer from incompleteness and skewness.

Furthermore, while multiple benefits are often captured under seemingly harmonious frameworks, such as the triple-bottom-line approach, the reality is much more complex. Financial, environmental and socio-cultural benefits of water often conflict with each other, such that a positive output for one can mean a detriment for the other. Thus, 'adding up' the total value of water is highly complex and requires careful understanding of winners and losers.

VALUING WATER FOR GREATER SOCIAL AND ENVIRONMENTAL JUSTICE

Accurately accounting for socio-cultural values of water can be difficult, but such a process is necessary to ensure water policies are inclusive and assist progress towards greater water justice, both socially and environmentally.

Enhanced understanding of the varying social and cultural backdrops behind water valuation can help to decipher the origins, complexities and drivers of value

systems, and through so doing, better inform ethics and encourage learning in harmony with the environment, increasingly considered indispensable.¹¹ Progress in valuing water will not only shed light on environmental sustainability challenges but also contribute to multiple dimensions of human wellbeing, including social, cultural, physical and spiritual.⁴

When an environmental change occurs or a policy is proposed, multiple dimensions and perspectives may enter into conflict. Often benefits that are more readily understood take priority over those that are harder to quantify. Thus, we propose a list of questions that aim to provide high-level guidance in situations when multiple water values are at stake:

- How is the proposed policy going to impact water values, and what do these changes mean for all affected stakeholders?
- Whose values are being considered, and how are such values being accounted for?
- Who is going to benefit from the change, and who will be negatively impacted?
- How is the winners–losers imbalance going to be mitigated?

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King's Water Centre works to incubate, elevate, and empower the best science and innovation to tackle the world's water problems. We are curiosity-driven, interdisciplinary, and solutions-focused. Based in the heart of London, King's Water Centre brings together scholars and practitioners for a just and sustainable water future.

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