https://doi.org/10.1038/s44221-023-00048-x

Climate policy is inundating the SDGs

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As climate-induced shocks and stresses increasingly occupy media attention, funding, national and global policy, and technical practice are shifting towards alignment with the United Nations Framework Convention on Climate Change's (UNFCCC's) Paris Agreement and away from the more narrowly sectoral Sustainable Development Goals (SDGs). Water resilience is emerging as a critical delivery mechanism for the Paris Agreement as the importance of adaptation and resilience accelerates. The SDGs, in contrast, have been unable to make use of either water resources or climate resilience as enabling tools for cross-sectoral integration and development coherence.

Our vision of economic development is at a transition point. The 2023 United Nation Water Conference (UNWC) contains five 'dialogues' that represent a traditional approach to development. These dialogues reiterate long-standing demands for additional data, funding, political support, integration with other sectors, ecological preservation, and technology, all delivered through improved governance. While these points are valid, these issues could have been presented at the first UN water conference in 1977. Indeed, this year's conference risks not highlighting or capturing insights from new, disruptive, or synergistic narratives about water, especially those that challenge silos and may inform emerging water-related issues. The emphasis on framing water through the Sustainable Development Goals (SDGs) may even serve as an obstacle to reaching new political and technical audiences given that the 2030 agenda neglects many connections between SDGs, especially how particular targets may be contingent on, enabled by, or even competing with other goals. Arguably the most disruptive driver for the SDGs and the water community in recent decades comes from climate change, which will be a minor topic in one UNWC dialogue.

Climate change as the new force in water

Both strong scientific evidence and well-researched journalism around climate change impacts have highlighted the ties between the global water cycle, anthropogenic climate change, and economic, social, and ecological shocks and stresses. While particular events, such as the extreme fires in Queensland in 2021 or Pakistan's severe floods in 2022, have revealed specific threats from water–climate disasters, what may be more significant are a handful of evolving stories that show the depth and complexity of conjoined water and climate risks for technical professionals, economic policymakers, and the general public; among many, the megadrought in western North America and the dramatic loss of glaciers and snowpack from high elevation regions such as the Himalayas or Alps. While diagnostic about impacts and causes, these narratives rarely describe what more systematic solutions in these regions might look like. Very often, these impacts are treated as serious but untreatable diseases, emphasizing disruption and loss rather than tracing options to reorganize hydrologies, ecosystems, and economies. (Fig. 1)

Fig. 1 | Malheur National Wildlife refuge in North America's Great Basin. The water-scarce Great Basin is one example of a region that has been experiencing more extreme drought in recent decades, prompting sometimes violent conflict over how to allocate scarce water resources to both traditional and new livelihoods, to adjust the regional economic development trajectory and to manage trade offs with local and regional ecosystems. Finding a long-term set of ecological, social, and economic solutions is less likely to come from working through isolated, discrete indicators like the SDGs and more likely to come from seeing that issues are complex and connected, and that climate change is presenting a new set of options and choices for the region that may require decades to play out.

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Water has achieved a much higher level of visibility in policy negotiations over the last several United Nations Framework Convention on Climate Change (UNFCCC) annual global meetings (referred to as COPs or Conferences of the Parties), especially around the policies, finance, and science of adaptation and resilience. Moreover, electoral politics and the media are placing new pressures for solutions on resource managers and policymakers, while major financial and aid institutions are being asked to document their success in addressing climate impacts and supporting the goals and processes outlined in the UNFCCC's Paris Agreement.

These pressures update the stark choice presented by the Stern Review in 2006 (ref. [1]), which predicted expensive adaptation and more limited adaptation options if economies did not decarbonize rapidly. We now face a different choice: given that we did not decarbonize, are

some paths for adaptation more useful, coherent, or cost effective than others? Can current risk management approaches address the large-scale climatic and environmental 'transformations' described by the Intergovernmental Panel on Climate Change (IPCC) (ref. [2]), or do we need to pursue a more intensive, system-level approach to resilience for infrastructure systems, communities, ecosystems, and even national economies? Global and national adaptation and resilience policies are now coalescing around the language of freshwater resilience, describing new audiences, funding flows, and policy modalities[3–5].

Two policy visions for water

In 2015, two economic development frameworks that held strong implications for water became active. The 2030 Agenda for Sustainable Development — which encompasses the seventeen SDGs — was adopted by the UN General Assembly in September of that year, while in December the Paris Agreement was negotiated and launched at UNFCCC COP21.

From the beginning, water has had a well-defined role in the SDGs through SDG6, which has focused on clean, safe, and reliable water supply and sanitation (WASH) services. In contrast, the Paris Agreement does not mention water. The Paris Agreement sets a clear target for global mitigation efforts to limit air temperatures to about 1.5°C over preindustrial levels and asks countries to finance and implement sufficient climate adaptation interventions.

These two frameworks have remained parallel and apart. The SDGs have suffered from a very narrow vision of water. WASH services often limit water as a tool for public health rather than as a resource whose management is grounded in engineering, eco-hydrology, economics, or the law. A palpable tension exists between accelerating progress on WASH versus seeing water as an asset to catalyze progress on SDGs targeting energy, food and agriculture, cities, ecosystems, disaster response, and climate change, among others.

Like the 2030 Agenda, the Paris Agreement created a new policy instrument: the Nationally Determined Contributions (NDCs) outline high-level climate commitments in five-year plans designed to increase in ambition over each cycle. Unlike National Adaptation Plans (NAPs), every UNFCCC signatory must submit an NDC outlining national priorities for mitigation and adaptation. The NDCs were launched at COP26 in Glasgow in 2020, which was the first global climate conference where the issues of adaptation and resilience achieved parity with mitigation.

While absent in the Paris Agreement, water is superabundant in the NDCs. About 87% of the NDCs mentioning adaptation also reference freshwater[6], spanning three categories. Most NDCs describe water as a hazard, typically droughts and floods. Almost as common is the mention of water as a sector — referencing adaptation needs for water utilities and water storage and transport, complementing SDG6 (water access) and SDG13 (climate resilience).

A few countries also describe water as a 'connector' for diverse sectors and development issues. In these NDCs, water ensures policy coherence and becomes the currency for resolving sectoral trade-offs. Countries such as Costa Rica, Egypt, and Bangladesh draw on this connective role for water, which has also been highlighted by a number of financial institutions.

Resilience divides the water community

If SDG6 has revealed divisions between WASH and water resources management in the water community, the Paris Agreement has created a new alliance around what has been referred to as 'water-related adaptation' by the IPCC (REF. [2]). These are methodologies and projects that are not targeting the water sector per se but use water resources as an entry point for more effective climate adaptation[7]. Within the COP processes, there has been strong momentum around water as a strategic intervention for adaptation and resilience, with water being mentioned for the first time in a COP outcome document in preparation for 2023's COP28.

New frameworks began to emerge to power these shifts as early as 2009, when the inability to confidently predict future water cycle conditions was identified as a systemic threat to established decision-making processes, a state referred to as a crisis of "deep uncertainty" for the planning, design and management of infrastructure, investment and management of natural resources[8,9]. These warnings pointed to the low level of confidence in projected climate impacts on the water cycle and the inadequacy of past-predicts-the-future approaches to risk management.

Solutions such as the use of stress tests on the acceptable limits of infrastructure, policies and ecosystems have been developed in response, resulting in planning and design frameworks that span a wide range of climate futures suitable for exploring more robust interventions[10]. An alternative set of initiatives has explored how to manage uncertainty through planned flexibility[11]. Researchers and practitioners have also described how deep uncertainty might also be addressed through 'deep resilience': intertwining management goals across projects, often through water, such as urban flooding, groundwater management, hydropower, and irrigation[12]

Some of these concepts have been translated into policy frameworks. Since mid-2020, about two dozen countries have begun implementing a systematic approach to increase NDC coherence and ambition using shared water resources as an entry point across programs and ministries. Moreover, the UNFCCC itself has recognized that NDC focal points need training to implement a water-focused approach to national commitments and developed a partnership to deliver this curriculum. Financial institutions such as MDBs are pursuing 'Paris Alignment', a term of art for multilateral and bilateral donors to ensure funding reinforces the NDC priorities and which could effectively convert most development funding into climate finance. For instance, in 2022 the World Bank launched Country Climate Development Reports (CCDRs), which profile the national status and opportunities around mitigation and adaptation investments. The OECD has also recently promoted a new approach for broader economic resilience underpinned by water resilience investment pathways[13]. In practice, these trends reinforce efforts to achieve the IPCC's recommendation for 'water-related adaptation'[2].

Collectively these approaches represent a shift from modest climate de-risking and no-regrets efforts to active and ambitious resilience building implemented through structured decision-making processes[13,14]. In most cases, practitioners report that these methodologies produce significantly different project outcomes from previous risk frameworks.

Perhaps most importantly for the broader water community, these approaches are not limited to the water sector only since water is now being seen as a trans-sector climate resilience resource. Given their water-centric focus on climate uncertainty, they could be characterized as resilient water management (RWM).

RWM promises to provide the technical and analytical basis for adaptation priorities for COP28, including the Global Goal on Adaptation (GGA) and the Global Stocktake (GST). The GGA is an initiative that aims to define a set of indicators for adaptation and resilience comparable to the 1.5 °C target for mitigation in the Paris Agreement. The GST is a mid-term review of the first generation of NDCs, which

can be expected to reveal shortcomings and increase ambitions. At both the 2022 UNFCCC intersessional and COP meetings, national parties publicly identified long-term and large-scale climate impacts, especially climate transformation, as a major priority for both policy domains. The integration of RWM with the climate community represents a new, politically powerful, and increasingly well-funded partner for the water community. In contrast, the SDGs do not address climate transformation, while even the premise of the 2030 goals raises the question of what will happen if successful implementation is disrupted or eroded by climate change after 2030.

Can the SDGs adapt?

Currently, the UNWC subsumes climate change resilience in a catch-all dialogue category with more general environmental, biodiversity, source to sea, disaster risk reduction (DRR), and climate mitigation issues. The opportunity to extend the partnership between the water and climate communities around UNFCCC processes, climate policy, NDCs, and RWM seems elusive.

The rise of water-centric NDCs may actually fragment traditional water silos as momentum grows around adaptation and resilience among funders, implementers, and national and global policymakers, especially as NDCs begin extending to subnational priorities. NDCs subsume the SDGs within a low-carbon and resilient development lens, while the structure of the SDGs themselves does not encourage more transversal, staged, and leveraged approaches to individual goals. Economic development is being redefined through a climate change lens as alignment with the Paris Agreement rather than as Agenda 2030.

What might a more forward-looking and climate-oriented UNWC and water community look like? The organizers might focus on showcasing paths to elevate engagement with the climate community, including:

- Showcasing water-centric NDCs and NAPs.
- Upscaling a shared vision of RWM, especially for parts of the water community that have been slower to engage on climate issues, including WASH, the private sector, natural resource management and conservation, and blended finance.
- Focusing on pragmatic solutions to keep pace with the challenge of climatic and ecohydrological transformation.
- Emphasizing water resilience as a concept for finance ministries and macroeconomists, such as investing in redundancy and flexibility, assuming deep uncertainty, and disaggregating growth from intensifying water usage.

Climate change disrupts how the water community has made decisions. Achieving the SDGs for 2030 and beyond requires new alignments with the climate community.

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Published online: 13 March 2023

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Acknowledgements

I would like to thank I. Timboe for her comments on an earlier draft.

Competing interests

J.H.M. worked as an advisor to the Asian Development Bank and World Bank on water and climate change issues. He is currently working with a coalition of national party, private sector, and NGO groups on a set of cases and recommendations to articulate water resilience as an operational economic concept, which is funded by the Kingdom of the Netherlands, GIZ, and the Kingdom of Spain.