5 key insights to improving global water management

ASU expert details findings from international Water Policy Group's latest report

By Preesha Kumar , ASU News
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Access to clean, reliable water determines the fate of human civilizations. Yet even today, water policy around the world remains fragmented and often ineffective.

States in the Southwestern U.S. failed to compromise on how to manage the dwindling Colorado River water supply, leaving many residents wondering who will suffer the heaviest cuts — even after the federal government stepped in.

Despite heavy rains and flooding in South Africa, its largest city — Johannesburg — faces a water crisis due to neglected infrastructure and governance failures.

More than 70 million people rely on the Mekong River, which flows through China, Myanmar, Laos, Thailand, Cambodia and Vietnam. But hydropower dam construction, unpredictable rainfall and local policies threaten this source of life and livelihoods.

A new report from the Water Policy Group, a collective of water experts and government advisers, outlines the challenges countries face as they manage water supplies and insights to help improve water policy. The report draws from a survey of national water leaders from 102 United Nations member states.

Olcay Ünver, a senior Global Futures scientist with Arizona State University's Julie Ann Wrigley Global Futures Laboratory, has spent more than three decades in public service, leading water programs at multiple United Nations organizations. As a member of the Water Policy Group, he was an important contributor to the report. Here, he breaks down five key takeaways for international water management, as well as what they mean for Arizona.

1. Climate change, floods, drought and rising demand are the leading water management challenges

Across the Water Policy Group's 2021, 2023 and 2026 reports, national water leaders consistently identified climate change, floods, droughts and increasing demand as their leading water-related risks. Ünver says that climate change and human activity are the main culprits.

"Rising water demand has multiple and often interacting drivers, including population growth, urbanization, changing consumption patterns, irrigated agriculture and industrial activity. Water managers must plan not only for changing averages but also for greater variability and extremes," Ünver says.

Water management strategies can mitigate these risks, but with governments controlling the majority of waste and water management systems, policymaking must keep up with these changes.

"Systems designed decades ago may not be equipped to remove pollutants of emerging concern, accommodate changing design flows and more extreme floods and droughts, or meet newer public-health and environmental standards. Aging assets, deferred maintenance and unequal service quality add to these pressures in the United States," he says.

The Flint water crisis is a great example of this. In 2014, the city of Flint, Michigan, changed the source of its municipal water supply from Lake Huron to the Flint River as a cost-saving measure. The more corrosive river water leached lead out of aging water pipes, contaminating thousands of homes.

"Flint illustrated that physical infrastructure, water treatment, regulatory oversight, financing, institutional accountability and public trust must function together. Infrastructure is not adequate merely because pipes and treatment plants exist," Ünver says.

2. Financing and governance limit progress toward goals

In 2015, the United Nations established 17 Sustainable Development Goals, a blueprint for peace and prosperity for people and the planet. Goal 6 is to "Ensure availability and sustainable management of water and sanitation for all."

Participants in the Water Policy Group report cited a lack of financing and governance as the main obstacles to achieving this goal.

"Water often competes with highly visible and immediate demands for public funding. Preventive investment can consequently be postponed until a drought, flood, system failure or public-health emergency exposes the cost of inaction," Ünver says.

The U.S. also does not have a national system for water allocation and preservation, relying on states and local governments to hand out water on a first-come-first-served basis. Ambiguities like these have led to water conflicts among the Colorado River basin states.

"Administration varies considerably from state to state. Federal and state laws, interstate compacts, court decisions, tribal water rights and international treaties add further layers," he says.

3. International cooperation can help developing nations

Only 70% of the low-income countries in the Water Policy Group's report stated that they felt fully supported by national scientific initiatives, though 100% agreed that international cooperation would help achieve their intended goals.

Ünver says that multilateralism can support lower income nations by taking blueprints from other countries and adapting them to their unique circumstances at home. He argues it makes water policies easier to design and implement.

"Such international support can help national leaders secure resources and justify difficult decisions within their governments," he says. "The report brings the lived experience of national implementation into the international discussion."

4. Water policy must connect across sectors and levels of government

Good water outcomes are essential for national well-being. Of the government leaders surveyed, 88-99% reported that effective water policy benefits for public health, food security, energy security, economic development, climate change mitigation, environmental protection and disaster risk reduction. But that understanding doesn't always translate to action.

"Recognition of water's importance does not always produce coordinated budgets, institutions or implementation. Fragmented responsibilities remain one of the leading challenges," Ünver says.

Agriculture is the world's largest water-using sector, accounting for roughly 70% of global freshwater use. Developed countries often use less water for agricultural purposes, but Ünver says Arizona is a notable exception. This makes water policy integration extremely important for Arizonans.

"A durable solution requires collaboration that produces coordinated action: arrangements grounded in current hydrology and capable of determining how conservation, shortages and risks will be shared, with meaningful participation by Colorado Basin states and continued cooperation with Mexico," Ünver says.

5. Water spans borders — policy should too

Water sources that span multiple regions and nations account for over 60% of our freshwater supply. For example, the Colorado River supplies water to seven U.S. states, 30 tribal nations and Mexico.

"Effective international cooperation establishes shared objectives, principles, knowledge and opportunities for learning while leaving room for national, regional and basin-level adaptation. Regional and local policies are therefore essential components of international progress," Ünver says.

Ünver says the Water Policy Group hopes to build and expand this framework. Drawing upon previous reports and survey findings, they have developed a comprehensive but non-binding global framework for water policy and practice. This was recently passed in the United Nations General Assembly.

“Internationally agreed principles and guidance can provide a credible starting point and make difficult reforms easier to develop and justify, without prescribing identical solutions to every country,” he says.

Ünver says that our water future is not predetermined, but also not ensured. If issues like climate change, rising demand, deteriorating ecosystems and inadequate infrastructure persist, they will place increased pressure on communities across the globe. While the data and policies are starting to take shape, governments must take action and put them into practice.

“Water policy drivers, consequences and solutions increasingly cross sectors and borders. That is why national leadership and effective multilateralism must advance together,” he says.

He adds that water policy doesn’t have to start with the government — public action can also help shape the future of water policies.

“Citizens should understand where their water comes from, who makes decisions about it, how services and ecosystems are financed, and how their own choices affect demand and water quality.”

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Main image



Water policy is interdisciplinary, international and complicated. The new water policy report co-written by ASU Professor Olcay Ünver highlights key points toward improving international water policy. Art by Sophia Franz/ASU