

WATER IN THE 21ST CENTURY:
DEFINING THE ELEMENTS
OF GLOBAL CRISES
AND POTENTIAL SOLUTIONS

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Will we run out of fresh water in the 21st century? The media highlights the parched lands, dry riverbeds and springs and falling groundwater tables across the world daily. Over a billion people living in developing countries without access to safe drinking water are facing economic and water poverty.¹ Another real and troubling indicator is the rapid rate of aquatic habitat degradation and biodiversity loss in the last century.² Projected changes in climate due to greenhouse gases invariably portray a future world that is much drier in the tropics—where over half the world’s population lives—and suggest a global increase in floods and droughts.

Is a global water crisis already upon us? The answer to this question seems to depend on who you ask. On the one hand, active voices such as Sandra Postel, Peter Gleick, Vandana Shiva, Lester Brown and Paul Elrich, as well as leaders of major global organizations with an interest in water, have been warning of an impending global water catastrophe. On the other hand, the mainstream academic community involved in hydrology and water has largely ignored the topic. For example, a Google search for “water crisis” leads to almost 1 million hits, but the same search on Google Scholar yields approximately 4,000 hits as compared to over 1 million Google Scholar hits for “climate change.” Many of these articles focus on policy solutions, but do not necessarily explore the nature of the problem in-depth. Furthermore, the literature is largely non-American and contains references to much of the same work. Introducing “global water crisis” into a Google search reduces the number of hits by a factor of ten. In fact, the handful of scientists who do study this problem have divergent opinions as to whether and when the world will run out of water.³ A handful of scholars—particularly economists—go so far as to claim that a global water crisis does not exist or is, at best, overstated.⁴ These scholars generally find that, on the whole, water access is improving worldwide and that with continued efficiency enhancements, the amount of water will continue to meet existing demands.

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Perhaps the way the global water crisis has been defined—whether the world will run out of freshwater—is the wrong way to look at the problem. While there are many scholars looking at the range of localized and specific water challenges that are occurring around the globe, it seems that the academic community has yet to find success in accurately characterizing the sum of their parts. In this article, we argue that there are three distinct water crises—or challenges, depending on who you ask—that have yet to be systematically connected by scholars. It is by looking at how these three challenges are interrelated that we can better articulate the global characteristics of water resource dilemmas and, ultimately, identify the global factors that can help solve these dilemmas.

REORIENTING THE DEBATE: THREE CRISES ROLLED INTO ONE

Three types of water crises appear prominently in academic and professional discourse. First, there is the crisis of access to safe drinking water. This includes the inability to provide basic infrastructure to store, treat and deliver water supplies to a large part of the world's population. Second, there is the crisis of pollution that is analogous to climate change in that it relates to the impact of by-products of resource use. Third, there is the crisis of scarcity, or resource depletion, which is analogous to the fear of running out of oil. Now that we have defined three types of water crises, we can examine what we know about them, how they are linked, to what extent they are global problems and, finally, what are some possible solutions.

The Access Crisis

Many people equate the global component of a water crisis with the vast number of people worldwide whose economic productivity and social development is limited by access to safe drinking water. For instance, the World Health Organization, the World Bank Group Development Education Program, Global Water and the Global Water Challenge draw attention to the fact that over 1 billion people lack access to safe drinking water. As a result, the United Nations Millennium Development Goals, the World Water Forum and other groups have rallied around a common metric for this issue by measuring the number of people with access to safe drinking water. For example, one of the key targets under the Millennium Development Goals is to “reduce by half the proportion of people without sustainable access to safe drinking water.”⁵ Although these goals have been lauded as important policy directives, the international community has not yet made much progress in meeting them.⁶

Why is it so difficult to meet these goals? A vast body of literature points to the technical, institutional and financial challenges involved in developing the infrastructure and systems needed for water storage, supply and treatment.⁷ As this