

# *The* NATIONAL STRATEGY FORUM REVIEW

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## **Water and Environmental National Security**

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Water availability and accessibility are, arguably, the most important components of environmental concerns. This article focuses on the broadly defined national security dimension of water.

Environment is the interdependent natural and societal components that sustain a society. It is international and national in scope and is comprised of water, oil, economics, trade, diplomacy, religion, politics, and military conflict.

Water Haves and Have-nots are involved in conflict over the availability of water. Regional conflict occurs at the fault line between water Haves and Have-nots.

Oil was the pivotal political and natural resource of the twentieth century. It is possible that water, particularly fresh water, will have parity with oil in this century. Water is indispensable for both food and societal health. Fresh water abundance is being displaced by acute water shortage where it is most needed—in increasingly heavily populated urban areas and in most parts of the world. It could be argued that in these areas water is more critical than oil. Oil can be partially replaced by alternate energy sources; water cannot.

Water is a flexible and mobile resource. It is self-sustainable; it evaporates, de-salinizes, clears itself, and falls to earth. There is a great amount of water in areas that are not human-accessible. A large amount of rain falls over oceans; there are underground aquifers, many of which have been depleted, and some are either unknown or inaccessible. Underground aquifers, once they are tapped, are non-renewable.

The net effect is that less than three-tenths of one percent of the earth's water is accessible. The phenomenon of the twentieth and, more particularly the twenty-first centuries, is that accessible water and population centers are located in the wrong place. Less than one percent of the world's freshwater supply is available for human consumption. Twenty percent of the world's population lacks freshwater for domestic needs; forty percent of the world's population lacks water for basic sanitation purposes.

Water is the most important natural resource. It is life-sustaining: health, agriculture, demographics, and the economy. It governs how people live their daily lives. Because of this, water has important political and national security dimensions. This fact is frequently overlooked as a major national and international strategy issue.

The Green Crop Revolution of the 1960s delayed urgent analysis of the net severe water scarcity. But the crop gains resulting from the Green Crop Revolution have been canceled by population growth and increased per capita consumption. The era of cheap water and cheap food is ending. The point of disequilibrium has been reached and no remediation policy is on the horizon. Decreasing water availability and failure of water harvesting and distribution structures will directly affect productivity, and the health of water Have-not states, resulting in decline, failure, and ultimate collapse.

The subject of global warming and climate change is debatable. However, it is suggested that, in order to craft a comprehensive water strategy, a 50- to 100-year time frame is required. The outer limits of national security projections are less than 10 years for planning purposes. However, there are foreseeable short-term events involving prolonged drought and intermittent flooding, and periods of hot and cold weather arising within a 3- to 5-year time frame. In this context, abrupt climate changes, apart from gradual climate change, could occur more rapidly than states can adapt to them. For example, abrupt climate change could continue the apparent glacier melt acceleration experienced in Antarctica and Greenland. The projection is that sea levels could rise in the intermediate future affecting ocean littorals—the habitat of one-third of the world population.

Water scarcity, sea level rise, and other related great magnitude problems require adaptations by states and individuals.

By the year 2025, an estimated fifty percent of the Asian population will live in urban areas, compared to 1990, when approximately ten percent of Asians lived in cities. As populations increase, and move to urban centers, with accompanying increased consumption, demand, and waste, coupled with decreasing water availability, the mobility trend will increase precipitately. Population growth, particularly centered in urban areas, increases society's need for water for daily personal use and food production. Rapid urbanization is accompanied by industrial concentration. People and industries located in urban areas require more water per person for daily personal use than people in rural areas.

Water scarcity triggers competition and conflict. Target areas for water conflict are North Africa, the Mideast, and South Asia, where the demand for water is increasing rapidly and the supply is diminishing. Rainfall in these areas is either scant or occasionally huge and the population in these troubled areas gamble that there will be sufficient rainfall to normalize the flows of major rivers without extreme rainfall that would cause flooding.

There will be growing, intense competition between water Haves and Have-not states, and intra-state competition between the rich and poor. Water will become an expensive economic commodity, with some who are able to pay, and some who cannot. A privileged majority will emerge, and there will be competition between rich and poor states. The minority of states

which are located in temperate, well watered zones, and the majority of states, which are located on fragile, arid lands or seasonably over-saturated lands, will be positioned for competition and conflict.

The U.S., with the exception of the arid lands west of the hundredth meridian, and Canada, are water Haves. The U.S. west is arid, but basically water sufficient at the present time. Canada is in the very top echelon of water Haves. Thus, there is no water competition. There is water competition between the U.S. west and Mexico, which may be an irritant in addition to immigration and drug-related conflict between the two countries. However, this is mild when compared to conflict among water Haves and Have-nots among adjacent states.

Mideast Islamic countries lack large water resources. And there is marginal use of technology for water accessibility. Yemen is a black hole for terrorism and is the first country to have a water deficit so great that the country has become paralyzed. Its wells will run dry within 10 years, accompanied by a rapid increase in their population. The result will be famine and civil unrest because eighty percent of the population will experience water poverty. For example, there is water profligacy in Yemen where qat, the local drug of choice, consumes forty percent of available water.

Agricultural crop growing is water-intensive and inefficient. Food is composed mainly of water, and an enormous amount of water is required to grow crops, especially by irrigation. An average bread loaf is composed of one pound of wheat, which requires a cumulative total of 250 gallons of water. Eight hundred gallons of water are required to produce one hamburger patty – mostly to grow cattle feed.

Water scarcity is of the same negative magnitude as oil shortage. However water more profoundly affects health and morbidity and could be the next plague-like event. Water is an underpriced commodity. Pricing a toilet flush at \$1 or charging \$1,000 for a round of golf represents the true economic value of water. These facts should capture the attention of consumers and policymakers alike.

Water is heavy and large quantities are required for water-related enterprises. Transportation of water, other than by gravity flow, and pumping through pipes, is economically prohibitive. There is no one-size-fits-all solution to local or regional water scarcity. Each watershed is unique. The good news is that water is misallocated, misgoverned, and misused. Thus, even minimal improvements could achieve marginal gains that would encourage more sophisticated technology applications to be used and might result in public and policy awareness resulting in incremental gains.

The equation for solving water scarcity has two factors: voluntary and involuntary water savings, and large scale new technologies. At present, neither factor is socially, media, or politically cognizable. Society has been coasting on the availability of watersheds, aquifers, and ecosystems. Depletion of natural resources is near and there is no prudent preparation for the transition to the new era of water shortage. There are water-sharing opportunities such as the International Center for Integrated Mountain Development in the Himalayan region; the Nile

Basin Consortium, composed of ten regional states; and the Mekong River Consortium (six states).

The U.S. should encourage regional water cooperation and support international climate analysis affecting water availability and accessibility. A UN Climate Change conference is scheduled to meet in Cancun, Mexico, in November. The U.S. government administration supports the objective of the conference in principle; however, the U.S. Senate may not be so inclined.

However, modern societies respond well to crises. Parched earth and associated threats grab public and political attention. Hopefully, the solutions will develop in phases. First, the Have-water states must recognize that water scarcity conditions will degenerate soon and many marginal states will become Have-not water states. Second, the alarm must be sounded to awaken states and their societies that an occasional water shortage is more than an annoyance and will become a major threat. Third, when this message is internalized by citizens and the media, the political process could begin, leading to amelioration and possible solution. Fourth, a water efficiency use project could emerge, based on economic and political leadership addressing the objective of efficient use of existing water supplies.

The first step in this process is recognition of the magnitude of the water scarcity issue. Assuming water-related tensions and conflict can be controlled during the next decade, there is a window of opportunity to institute modest gains such as hydroponic agriculture, repair of leaking lead pipes, and other watershed specific management efficiencies, and repricing water consumption in Have countries that could result in water technology fixes motivated by international cash awards. Imagination, ideas, and innovations are the hallmarks of modern society. This is the challenge for the young generation.

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