



**Global Institute for Water
Environment and Health**

Leadership For Positive Change

The Impact of Water Scarcity on Human and International Security

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As the global population continues growing past the seven billion threshold, urbanization and industrialization accelerate, and climate change continues, the value of water is increasing. Of all the water on the earth, 0.007% is available for human use; this is 37% less water than was available in 1970.¹ This minimal amount of fresh water available to only eighty percent of the global population has led some political scientists to predict that water wars will be the oil wars of the twenty-first century.² Other research has pointed to bilateral cooperation overruling the tendency to go to war, as water is such a necessity that one cannot afford to lose it. In a local context, water scarcity has a clear detrimental affect on the local environment and on human security. The role of water scarcity in an international context is more difficult to define as no two water relationships are the same, and water has become far more than just a natural resource.

Water scarcity and international security: an ambiguous issue

Around the turn of the twenty-first century, political scientists began to emphasize the threat of water being the future commodity over which nations go to war, much as oil was in the later twentieth century. Former Egyptian President Anwar Sadat, King Hussein of Jordan, and former United Nations Secretary General Boutros Boutros-Ghali have all said that water will be the cause for the next war in the Jordan-Israel region.³ Former Israeli Prime Minister Ariel Sharon has attributed the Six Day's War (1967) to water control issues and Syria's diversion of the Jordan River; this war is referred to by many who argue for the future

¹ Wolfe, 29.

² Arsenault.

³ Darwish.

presence of international water wars.⁴ In opposition to these arguments is a growing sector of water experts, often scientists, who see international cooperation as a more realistic future.

These advocates see no historical precedent for water wars, only water conflicts.

Much of the debate over water wars surrounds the use of the word “war.” This can be defined in multiple ways and each definition influences one’s view of history and the future. With a broader definition of war, one can find many historical examples. Between 1948 and 1999 there were 507 conflictive events in which water was the main instigator.⁵ Others who use a much narrower definition of war see no historical precedents for water wars, save for one example 4,500 years ago.⁶ Environmental activist Vandana Shiva defines war not only as violent conflicts but as clashes between paradigms, a phenomenon she sees everyday and throughout the world.⁷

The debate over water scarcity and conflict goes far beyond this dispute over semantics. Political scientists, scientists, and experts each view the problem with different definitions of water scarcity, different perspectives on security, and different interpretations of history. An international development expert claimed that, “We don’t have a scarcity problem; I am sure we have enough [water],” in direct contradiction with the data coming from the United Nations and scientific communities.⁸ Political reporters at the British Broadcasting Corporation saw water wars as practically inevitable⁹ and the stance of an analyst for the North Atlantic Treaty Organization is that water resources are a link between

⁴ Darwish.

⁵ Giordano, Giordano, Wolfe, 301. An exhaustive list of water conflicts dating back to the Sumerian and Biblical stories of Noah and the great flood can be found at <http://www.worldwater.org/conflict/list>

⁶ Wolfe, 30.

⁷ Shiva, x.

⁸ Fino (interview).

⁹ Darwish.

the environment and conflict.¹⁰ A representative of the Institute for International Sustainable Development holds a view directly counter to this and argues that, “there is, as yet, no robust empirical link between environmental stress and the start of violent conflict.”¹¹ The BBC also reported that issues of water sharing have been a stumbling block in Israeli-Palestinian peace negotiations since 1991.¹² According to the New York Times, Israel and Palestine are a shining example of water cooperation between conflicting states. What becomes clear amidst all of these disagreeing opinions is that one cannot explore the relationship between water scarcity and international security as one that is solely a correlation between water and conflict; the problem is broader than that.

The relationships between water, the local environment, and human security

Human security is a paradigm in which security is defined by the needs of individuals rather than of states. It takes into account the changing nature of international security, where new threats come from non-state actors and the international economic system is moving toward multi-polarity.¹³ Increasingly, human security has also come to emphasize the relationships between the environment and society.¹⁴ Water, as a crucial and relatively rare resource, plays a key role in the creation and maintenance of human security regarding the environment. In fact, “it is the human security aspect of water scarcity which seems likely to cause security threats both nationally and internationally.”¹⁵ Water scarcity can be defined in two ways: physical scarcity (lack of rainfall; deserts; inequality of geographical water distribution) and economic scarcity (lack of money to pay for water, create the proper

¹⁰ Coskun.

¹¹ Brown, 4.

¹² Darwish.

¹³ Lambert (lecture).

¹⁴ Wolfe, 31.

¹⁵ Coskun.

infrastructure for distribution, or treat water).¹⁶

One manifestation of the human security dimension of water scarcity is in water's effect on agriculture. It is a simple one-to-one relationship: when water supply drops, food production does as well. A lack of fresh water leads to poor irrigation practices, the most common of which are the use of salt water and of poorly treated waste water. Each year, soil salination destroys nearly a million hectares of arable land in the Middle East and North Africa, the two regions with the lowest percentages of arable land and scarcest water resources in the world.¹⁷ States in these regions continue to use far more water than the water cycle can replace. Should this trend continue, Kuwait, Libya, Qatar, Saudi Arabia, the United Arab Emirates, and Yemen will each have 100 cubic meters of water per capita per year by 2025 which is “ten percent of the minimum annual renewable water resources needed to sustain economic development and public health.”¹⁸ Wealthy nations facing similar problems have invested in desalination plants, but the desalination process is energy intensive and the water produced is expensive. While the science exists to make desalination an option for ameliorating water scarcity, the funding mechanisms do not.

Water scarcity can force farmers to use poorly treated waste water for irrigation, an irrigation practice that releases chemicals and bacteria into the soil. This decreases the health of the soil and poses a medical threat to the farmers who work the land and the consumers who eat the produce.¹⁹ The impact of these chemicals on the environment and health is still relatively unstudied but research on similar pathogens and viruses points to a possibly endemic problem. The science to treat waste water is more readily available than desalination

¹⁶ Salim (interview).

¹⁷ Doble.

¹⁸ Ibid.

¹⁹ Doble.

treatment, but it faces the similar problem of facility accessibility. Waste water remains mistreated because the available sewage and treatment systems in many water-poor regions are aging, inadequate, and lack the financial attention necessary to restore this vital infrastructure.

The decrease in food production caused by water scarcity is linked closely with population growth. This combination creates deteriorating living conditions and further environmental problems, especially increased depletion of water supplies, deforestation, and desertification. These environmental changes cause poverty, malnutrition, and famines,²⁰ and play a significant role in the hunger that affects approximately one billion people in the world.²¹ For poor countries unable to change their irrigation and agriculture practices, the decline in food production, arable land, and water may cause an increased dependence on foreign food aid.²² A stable state cannot be dependent on another for such essentials as food and water. Thus food insecurity, as a consequence of water scarcity, connects water not only with human security but with state insecurity and instability.

Are water wars the next major challenge to international security?

As stated above, there is no one definition of “war” that can be implemented in discussions of the prevalence of water wars. This makes it difficult to evaluate their impact on international security in the twenty-first century. As an aid, the idea of water wars can be broken down into three general categories: international water wars, international water conflicts, and localized water conflicts. For the purposes of this essay, the difference between international water wars and conflicts lies in the size and subject. A war is official violence

²⁰ Coskun.

²¹ Lequime (briefing).

²² Doble.

between two established entities on a larger scale than a conflict; a conflict can, but does not have to, include violence. A water war is almost solely based on water, whereas a conflict has many causes.

Those who insist that international water wars will be the oil wars of the next century argue this theory because water is a crucial and dwindling resource, more important to human life than oil. Leaders such as Egypt's Sadat and Jordan's Hussein have reinforced the importance of water by stating that the only reason they would go to war would be over their water resources.²³ From a theoretic perspective, the threat of water wars is clear: as water is gaining value and becomes increasingly scarce, wars over the resource will inevitably increase. The problem with this is that water has so many facets. No longer *just* a natural resource, water is political, social, and economic.²⁴ As quoted in the New York Times, "I do not like the term 'water war.' We don't fight wars over such issues. Wars are caused by a lot of different things."²⁵

Another line of reasoning against the threat of water wars lies in the strategics of waging war over water. "War over water seems neither strategically rational, hydrographically effective, nor economically viable."²⁶ The aggressive nation would have to be downstream, thus on the receiving end of any pollution or reduced upstream flow, and the regional hegemony so that they are strong enough to sustain the war. The upstream response to downstream aggression would likely compromise water quantity or quality for the downstream nation. At this point the downstream nation would have to weigh the costs of waging this war against the benefits: to destroy a dam or water treatment plant would impact

²³ Darwish.

²⁴ Salim (interview)

²⁵ Sullivan, 1.

²⁶ Wolfe, 29.

the water quality and environment of the downstream nation more than the upstream one, while an invasion would have to include an occupation of the watershed to prevent retribution.²⁷ “It is hard to ‘win’ the water unless you take over territory—usually a costly exercise.”²⁸ To this end, the likelihood of war, an organized and prolonged conflict, over water seems unlikely.

The future of international *conflicts* over water

It is well established that the link between water scarcity and international security is hotly debated. The threat of water wars is a bit overstated, but the threat of international conflicts driven in part by water is not a threat, but a reality. There is little or no historical precedent for water *wars*, but there are many instances of intrastate and interstate conflict, fights, and violence. Twenty-eight percent of tensions over water have been conflictive.²⁹ NATO has found that, “water resources is an issue that reflects a link between environmental degradation and the outbreak of conflicts.”³⁰

As water quantity (and quality) decreases in a region, the stability of the area decreases as well. This is due to the many facets of water: its effects on economics, society, health, and politics. The Gaza Strip is an excellent example of this interconnected relationship. The region was under Israeli occupation for thirty years, over which the water quality decreased, wells were contaminated by salt water, and public health suffered from an influx of water-related diseases. Palestine retaliated against Israel in the 1987 *intifada* throughout the Gaza Strip and West Bank. “Was water quality the cause? It would be disingenuous to identify such direct causality. Was it an irritant which exacerbated an already

²⁷ Wolfe, 30.

²⁸ Sullivan, 1.

²⁹ Coskun.

³⁰ Ibid.

tenuous situation? Undoubtedly.”³¹ This can also be seen in the relationship between India and Bangladesh, two countries with internal instabilities and international upstream-downstream problems.

Refugees and forced migrants add another dimension to the question of water-related international conflicts. Refugees fleeing conflicts and climate change move into neighboring states that generally suffer from the same environmental problems as the home state.³²

Refugees put an additional pressure on the natural resources of their asylum countries and this especially affects water resources. It is a vicious cycle: regional armed conflict results in groups of refugees who create water scarcity in neighboring asylum states and this water scarcity can lead to further conflict and more refugees. Eritrean refugees in Sudan increased by thirty percent in 2006; there is arguably no state in the world prepared to cope with an annual water demand increase of thirty percent.³³ The refugee element underscores the notion that the mismatch between the population and available water is a key spark for conflict.^{34 35}

Water can also create localized water conflicts through its ability to marginalize and thus its (disputed) potential to attract conflict with radical groups. Anger over water management and marginalization can combine with other volatile issues to provide recruiting

³¹ Wolfe, 31.

³² Those fleeing climate change are legally not refugees but “forced migrants.” For the purposes of this paper, however, they will be referred to as refugees as that better reflects their situation.

³³ Coskun.

³⁴ Ibid.

³⁵ Another very contentious issue far beyond the scope of this paper is water privatization. Privatization not only significantly decreases water supplies and creates this mismatch between resources and population, but it is often implemented without thought to the local environment or economy. A pertinent case study is the strict water privatization and subsequent protests that overturned it in 2000 in Cochabamba, Bolivia.

tools for extremist groups, a fact recently recognized by the United States Pentagon.³⁶ Water has the potential to become a commodity throughout the world, but in regions suffering from water scarcity and internal insecurity it can, if commodified, be used as another recruiting tool for these radical groups (by restricting access or availability) or as “an instrument with which one population group can suppress another.”³⁷ The localized, regional discontent with water scarcity can also create targets for these radical groups. Water infrastructure such as dams, dykes, sewers, and treatment plants are all valid targets for those who wish to show their discontent with the management of their local natural resources.

Disagreements over the use of the word “war” notwithstanding, water does and will contribute to conflicts and thus pose a challenge to international security. Looking to the future, however, it seems unlikely that water will be a sole driver of conflict. NATO puts it as such,

Water-related tensions between countries often stem from reasons such as high population density, low per capita income, unfriendly relations, minority groups who internationalize the issue of water scarcity, implementation of large water development projects, and limitations of fresh water treaties.³⁸

It cannot be emphasized enough that water is now integrated into all facets of life and so its impact on local, regional, and international security is suitably intertwined with other conflictual issues.

Cooperation over water as a solution from the past and for the future

It is now clear that water contributes to conflict on all levels save for, perhaps, war. Yet there is a large contingent of scientists and political researchers who argue that cooperation over water is and will be an even more prevailing phenomenon than conflict. “Water could emerge

³⁶ Sullivan, 2.

³⁷ Arsenault.

³⁸ Coskun.

as a potential source of conflict. But it could also emerge as a potential source of economic growth and co-operation between these countries.”³⁹ History supports this view. Between 1948 and 1999 there were 1,831 water-related events, of which 1,228 (67%) were cooperative.⁴⁰ Cooperation over water is up to two times more likely than armed conflict.⁴¹ India and Pakistan often experience bilateral conflicts, but the two states have “demonstrated a remarkable ability to separate water issues from larger conflicts between the two countries,” maintaining stable water relations since the creation of the 1960 Indus Water Treaty.⁴²

Many of those who argue that water is more likely to foster cooperation than conflict base their arguments on the same fact as those who predict war: water is a vital natural resource.

The same water interdependencies among the world’s 263 transboundary rivers that often make water a matter of high politics can also lead states to find ways to avoid conflict and de facto, if not proactively, cooperate with one another. The fact that environmental, economic, political and security systems depend so heavily on this resource, which fluctuates in space and time, emphasizes the need for long-term, iterated coordination or cooperation.⁴³ States cannot afford to lose access to this resource and this need to fulfill their self-interests drives their need for cooperation.

Also contributing to the growth of water cooperation are non-profits and other organizations that believe “a war for water is easily averted” through mediation, mitigation, and amelioration.⁴⁴ The Global Institute for Water, Environment, and Health uses water along with energy as tools for development and cooperation in Africa’s Great Lakes region.

GIWEH is so dedicated to the idea of water cooperation that they do not even speak about

³⁹ Waslekar.

⁴⁰ Giordano, Giordano, Wolfe, 301.

⁴¹ Sullivan, 1.

⁴² Giordano, Giordano, Wolfe, 298.

⁴³ Bencala and Dabelko, 24.

⁴⁴ Sullivan, 1.

conflict; they maintain that, “water *could be* a source of war...but it could also be a source of peace.”⁴⁵ To create this cooperation, organizations like GIWEH are using mitigation to overcome the political, social, and economic factors associated with water. It is difficult to change mindsets about such a staple as water, but this is the only way that cooperation can be created. Mitigation and “water dispute amelioration [are] as important, more effective, and less costly than conflict resolution.”⁴⁶ Once states or organizations establish cooperative water regimes, they are very resilient. The 1960 Indus Water Treaty is one such example.⁴⁷

The 1960 treaty and historical patterns prove that cooperation over water is a reality that can, will, and should continue into the future. Water scarcity is so intertwined with the most important issues of our day—politics, economics, health, society, geography—that the prevalence and threat of conflicts over it should force us to reevaluate the interactions between humans and their environment. Dealing with water quantity, quality, availability, and access can improve public health, boost agriculture, potentially decrease the number of climate change refugees, decrease terrorist and radical groups, provide less incentive for volatile regions and neighboring states to engage in conflicts, and most of all ensure human security. It still remains difficult to analyze the water and security situation of the present, let alone far into the twentyfirst century. As the environment continues to change and the world becomes even more integrated, undoubtedly elements of the analyses presented here will become obsolete. Yet one can hope that cooperation and mitigation begun today will prevent water scarcity from spiraling into future wars.

⁴⁵ Salim (interview)

⁴⁶ Wolfe, 34.

⁴⁷ Ibid, 30.

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