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# Are We Destined to Fight over Scarce Water Resources?

Are current international agreements strong enough to prevent future conflicts over water? Scott Moore argues that if conflict is defined as interstate warfare, then international agreements have effectively contained disputes in the past and will continue to do so in the immediate future.

By Scott Moore for ISN

Conflicts over and involving water resources are not new; ancient empires [continually fought](#) over the rivers of the arid Middle East, and some analysts believe that the 1967 Six-Day War was sparked by attempts to [divert the waters of the Jordan River](#). Yet in the past decade the notion that water scarcity is likely to stoke inter-state warfare has gained ever-greater credence. In a [1993 article](#), Peter Gleick wrote that “water and water-supply systems are increasingly likely to be both objectives of military action and instruments of war as human populations grow, as improving standards of living increase the demand for fresh water, and as global climatic changes make water supply and demand more problematic and uncertain.”

Gleick’s statement reveals two key elements of the “water wars” hypothesis: that water scarcity will serve as a driver, and that organized inter-state violent conflict will result. Understood this way, the question of whether the world is likely to experience future water wars can be based on past experience. And the evidence generally indicates that the proposed outcome - violent inter-state conflict over water - is extremely rare. For example, a [landmark 2003 study](#) of some 1800 inter-state “water-related events” between 1946 and 1999 found that although rhetorical hostility was pervasive, only 37 involved violence, and none resulted in inter-state warfare.

Other empirical analyses cast doubt on water scarcity as a causal mechanism for inter-state conflict. Studies find that water scarcity [increases the likelihood](#) that countries will seek to conclude treaties with their neighbors regarding shared river basins, as well as the [likelihood that these agreements will be strengthened](#) over time. Accordingly, the proposed direct linkage between water scarcity and inter-state conflict doesn’t appear to be borne out by available evidence. But this doesn’t necessarily mean that international agreements are responsible, or that they will continue to be sufficient to prevent inter-state conflict.

## How Effective Are Water Agreements?

International water agreements take a number of forms, but generally address water quantity and quality issues in shared lakes or river basins. The unique value of water resources for economic

activity is [generally thought](#) to provide an impetus for inter-state negotiation, as are some issues like navigation and water quantity allocation, which [demand inter-state cooperation](#) in trans-boundary waterways. Moreover, because these issues are most salient in shared flowing watercourses, river basins tend to be the locus of international water agreements. Although [most agreements are either bilateral or regional](#), a few are global in scope, most notably the [1992 Helsinki Convention](#), which promotes joint mechanisms to reduce trans-boundary pollution impacts and to promote sustainable and equitable use. While the Helsinki Convention principles are frequently cited in other agreements, most scholars stress the importance of [country- or region- specific factors](#) in informing most international water agreements. These include the geographic position of states *vis-a-vis* one another, economic and cultural ties, and the degree of water scarcity, all of which determine the success of international water agreements.

Conventional international relations theory also suggests that the [presence of a markedly more powerful state](#) may be able to prevent effective international regime-building, since this state may be able to gain more through intimidation than cooperation. Some research does indicate that inter-state rivalry [increases the probability of conflict](#) instead of cooperation regarding shared territory or water resources, but the bulk of empirical evidence indicates that inter-state cooperation regarding shared water resources is [possible and even probable](#) on the basis of shared economic and diplomatic relations. Immutable geographic factors, as well as the existence of previous military disputes between states, have been found [not to impede prospects](#) for international water agreements, suggesting that there are [fewer barriers](#) to inter-state cooperation regarding shared water resources than is often assumed. Nonetheless, further research suggests that some characteristics of international water agreements are particularly important in promoting and sustaining cooperation and preventing conflict.

Analyses of successful international water agreements often stress the importance of communication and interaction between water managers across countries. The presence of international “epistemic communities” of scientists, environmentalists, and other stakeholders with similar interests is generally thought to favor cooperation and facilitate “institutional learning” whereby agreements can be strengthened and optimized over time. In Europe, for example, scientific exchanges and inter-state civil society groups have been [credited with sustaining cooperation](#) on waterways like the Elbe and Rhine. [Other studies](#) suggest that the ability to tie water-specific issues to broader national economic and political priorities, often called “issue linkage” encourages persistent cooperation. Indeed, research on international water agreements also indicates that the most important function of international water agreements is to [constrain unilateral actions](#) such as water diversion or dam-building.

Although there are few systematic assessments of the effectiveness of international water agreements in directly preventing conflict, those which do exist generally concur that this is the case. An [account of the Indo-Pakistani conflict](#), for instance, notes that “the trans-boundary river management regime was the most functional bilateral relationship between the two South Asian powers.” Studies of regions like the [La Plata in South America](#) extend this overall picture of efficaciousness to regional as well as bilateral water agreements. Moreover, in contrast to popular perceptions that international agreements are generally toothless, at least one [large-scale analysis](#) finds that concluding river basin treaties improves inter-state cooperation on broader water-related issues as well. Overall, then, the available evidence suggests that current international agreements have effectively contained organized inter-state violence over water resources. Yet it remains to be seen whether extant agreements can be replicated in emerging regions where conflict seems likely, and whether current agreements can withstand increased water scarcity as a result of climate change and other stressors.

## Future Prospects

The possibility of inter-state conflict over water resources has always been predicated on the idea of growing water scarcity, and indeed current projections of global climate change, population and economic growth suggest that greater demands will be placed on diminished quantities of water in many regions, particularly in middle-latitude areas. Some assessments conclude that the risk of scarcity-driven conflict has been [consistently offset](#) by deepening institutional agreements, whereas others suggest that a [U-shaped relationship](#) exists between water scarcity and the probability of cooperation, and that in turn accelerating climate change may reduce prospects for continued international water agreements. Because current projections of global temperature increases and other climatic changes suggest non-linear change, there is a serious possibility that current models of international water cooperation may be insufficient to prevent acute scarcity from driving violent conflict beyond 2030. In the meantime, however, climate change and other global trends are unlikely to overload international agreements where they can be put into place and maintained.

Indeed, several areas of the world combine serious water scarcity with a paucity of mechanisms for international cooperation over water resources, and thus constitute “hot spots” with the potential for future violent conflict. River and groundwater basins in northern and sub-Saharan Africa are of particular concern because of the intensity of projected climate impacts on water availability, as well as the [absence of international water agreements](#). Similarly, the collapse of Soviet-era agreements created an [institutional vacuum](#) in Central Asia’s Amu Darya basin which has yet to be filled. Finally, the Brahmaputra River is the locus for [increasing concern](#) that China may unilaterally divert water from one of the Asian subcontinent’s most important riverine water sources—fears that so far are not specifically addressed by agreements between China and its neighbors. The absence of bilateral and regional agreements and institutions in these basins makes them areas of great concern for the possibility of water-related, inter-state violent conflict in the future.

## Room for Improvement

There can be no doubt that international water agreements have generally been effective in preventing inter-state conflict. However, issue linkage is an important means of facilitating cooperation, and effective cooperation is best sustained through mechanisms such as scientific exchanges and regular policy dialogue. Properly designed, international water agreements are likely to prevent future conflicts over water issues in the medium-term. However, international policymakers must focus their efforts on ensuring that properly-designed institutions are implemented in hotspot regions. Moreover, the possibility of water-related inter-state conflict should be given additional attention if projected climate, demographic, and economic growth trends prove to be accurate. This, in turn, suggests that the best means of reducing the probability of water-scarcity-driven inter-state conflict is to re-double efforts to mitigate and adapt to global climate change, improve population health and wellbeing, and promote balanced economic development.

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