Chaikin Chair in Geostrategy
University of Haifa

Is Water Really Not Being Fought Over?

Anton Berkovsky
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May 2016

The Chaikin Chair in Geostrategy, University of Haifa

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Reuven Chaikin was born in Tel Aviv, and became a senior partner in the Somech-Chaikin firm of chartered accountants. He evinced profound interest in geography and geopolitics, and contributed greatly to these fields at the University of Haifa.

May his memory be for a blessing.

Prof. Arnon Soffer
Holder of the Reuven Chaikin Chair in Geostrategy

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Preface

The purpose of this article is to point out the problems in the work of two American teams of researchers at Oregon State University and the Pacific Institute for Development Studies, in Oakland, dealing with disputes of water. We maintain that the conclusions suggesting that no water disputes exist – are need to redefine. Likewise, those who consider the drilling or closing down of a well to be of equal importance to a conflict over the waters of the Euphrates or Nile, are need to redefine yet again.

We therefore need to redefine the terms, such as disputes over water, water wars, or non-violent resolutions. The current forecasts about climate change and increased population growth in Third-World countries provides adequate reasons for recognizing that the risk of water wars will rise in the future, rather than disappear as predicted.

Our thanks to Murray Rosovsky for the translation from Hebrew, to Noga Yoselevich who prepared it for print including the maps.

We also owe thanks to many scholars who are responsible for the decision to publish this monograph.

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Haifa, May 2016

Introduction

This article discusses the problems besetting the definition of the phrase "water wars" with all its derivatives and the use made of it (conflict, dispute, etc.). Among other factors we shall attempt to put in proportion the controversial conclusions that spring up from time to time in diverse sources concerned with warfare, conflict and sundry struggles over water and in the political-media-public discourse fed by them.

A considerable part of our critique features databases for water conflicts. We do not aim to make any change in paradigms, but to raise some questions about the need to treat water conflicts more carefully, and also to criticize the sources and their processing. Among other things we shall show as misconceived the aim of denying the existence of water wars, and disregarding the global picture, which already today is replete with water struggles and apparently will become more violent in the foreseeable future.

Despite the considerable criticism leveled here at existing definitions and databases, we do not present new definitions or coding methods—a complex and consuming task; instead our contribution is the questioning itself of the paradigm presently existing, and the examples that we set out and that challenge the academic community to respond.

Research on water wars

To date much has been written and not a little learnt about water wars and their like that have been conducted in diverse ways and whose implications have found expression all over the world.

The written legacy of those concerned with water wars has broken records. Till now hundreds of books and articles have been published in the framework of various scientific paradigms and disciplines (from economics and sociology to history and geography) that give examples of wars over water being fought worldwide for the past five millennia at least.

Many books treat specific water wars, such as those in the Middle East (Soffer 1992, 2006; Berkovsky & Soffer 2014b; Naff & Matson 1984; Starr & Stoll 1988). Many

others deal with the discord over water on a smaller and more focused level. The best example here is the small state of Israel, which has been accorded hundreds of publications about its water (detailed bibliography in Soffer 1992, 1999, 2006).

Still, not the Middle East alone provides headlines and research on the subject. Wide-ranging disputes about water, within states and international, with total discharge surpassing hundreds of billions of cubic meters annually and affecting the lives of tens or even hundreds of millions of people—particularly of third-world countries, have enjoyed comprehensive treatment in various contexts. These are geopolitical, but also ecological, economic, and sociological. We may mention the vast subcontinent of India, which shares the controversial Indus river water with its rival Pakistan, with all the political, economic, social and military aspects this entails; or a long list of water wars, for example, inside India (Shiva 2002; Gleick 1993); Bolivia, in which ambitious infrastructure projects involving international financial interests sparked conflicts and even a popular uprising in the city of Cochabamba (Shultz 2003); South Africa, where the issue of free access to water blended with the socio-economic struggles that broke out after the end of the apartheid period (Dawson 2010); Sri Lanka, where struggles over water occurred in the setting of ethnic tension amidst war being waged in any case (Dissanayake 2006). The overall view of present-day conflicts worldwide provides intelligent insights into the existence of a problem with water, conflict and violent struggles over it, a manifestation which apparently will not be resolved in the near future (Ofori-Amoah 2004).

Several researchers into water conflicts from different angles have assembled databases containing thousands of items documenting instances of clashes in the setting of water. These data have undergone varied statistical analyses by diverse research methods, and by these means studies have been written which still today stimulate lively academic and public discourse.

A chronological documentation of wars over water has long been conducted by the researcher P. H. Gleick, who every several years publishes detailed charts of water incidents, from the time of the biblical Noah (some three millennia BCE) to 2014 (Gleick 2011; Gleick & Heberger 2014). At his initiative the Water Conflict

Chronology database has been created at the Pacific Institute for Studies in Development, Environment and Security in Oakland.

Every incident or event in Gleick's database is given its date, its exact geographical location, and type of dispute—violent or not. Naturally, the description of the event is accompanied by the sources on which it is based. All events in the database are classified into six sub-categories: control of access to or use of water resources (by states or other actors) that might lead to friction; water as a weapon in the hands of states; water as a political tool in the hands of states or other bodies; water in the service of terror groups (but not of a state); water as a target in armed conflict between states; development projects around water (economic, social) that cause conflict among states and among other bodies.

The comprehensive work of collection, as well as the thoughtful categorization, seem not to leave any doubt as to the necessity of the database and its veracity. However, precisely the multiplicity of cases and sub-categories of the collection expose its weakness; likewise the diversity of scales applied to the events it contains, the media basis that feeds it (not always reliable; possibly politically slanted), as well as the coverage of historical cases according to the diverse geographic regions. Thus media coverage of the Middle East and Israel is immeasurably greater than that of other regions, among other factors because of the "CNN effect." By contrast, water conflicts in states with censorship, or without reliable media, if any at all, hardly stand a chance of appearing in the database. Similarly, events nearer to the present time are covered much better than those at the start of the 20th century or earlier.

To substantiate the problematic nature of the database, we can indicate several curious events that have been inserted into it. It contains an account of an electricity shortage during the Protective Edge campaign between Israel and Gaza, which led to the closure of the sewage disposal station in Gaza and the flow of sewage in the streets (Akram & Rudoren 2013). There is a description of the demolition of seven water containers, a well and a pump—all illegal—at a Bedouin village south of Mount Hebron (Aburawa 2011). Alongside these we find entries on the distribution of the Indus water between Pakistan and India, which fairly often have been on the verge of nuclear war, and events resulting from climate change,

and water and food shortages; these caused clashes between shepherds and farmers of Darfur, which turned into an ethnic-religious conflict, continued with mass migration and almost genocide in every respect, backed by the authorities.

A large team of researchers at Oregon State University is also concerned with water conflicts, wars, and the settlement of these conflicts. It too has assembled a rich database (Transboundary Freshwater Dispute Data Base at Oregon State University). Unlike the aforementioned one, this is far more cautious regarding the sources, although it also contains marginal events and is politically tendentious. It is updated to 2008, and concerns water in dispute in international drainage basins.

The database was created under the leadership of Aaron Wolf, whose publications on issues of water conflicts have become classics. His team examined hundreds of such events from 1950 to 2000. By virtue of their database, Wolf's team concluded as follows: between 1950 and 2000, in international drainage basins "only" 37 cases were recorded of disputes over water in which there was also overt violence; in 30 of these cases, Israel clashed with its neighbors, or these clashes occurred among other Middle Eastern states. In only five cases were violent incidents recorded outside the Middle East. All these stood against 157 cases of disputes that concluded—they claim—with the signing of agreements to the satisfaction of all parties.

This team found that hundreds of other cases of dispute ended with an arrangement, and the fading of the dispute until it disappeared. However, there was "verbal violence, official or unofficial, medium or high." In sum, out of 1831 cases of non-agreement on subjects of international water, these researchers found that in one third of the cases the disputes were violent or verbal (507 cases) while in two thirds (1228 cases) the disputes ended with cooperation (Wolf 2002, 2009; Wolf et al. 2003, 2006; Yoffe et al. 2003). Based on this study Barnaly (2009), Jarvis & Wolf (2011) and Ahituv (2014—in a popular non-scientific journal) reached the grossly optimistic conclusion that in fact there were no water wars.

The seemingly persuasive arguments set out above are misleading. Nor does the problem lie in statistical processing (which actually is intelligent and all-encompassing). We maintain that the database of Oregon State University also is very vague in definitions; and similarly a considerable number of events included

in it are somewhat tendentious. This fact carries direct implications for these researchers' conclusions, as a convincing outcome cannot be reached with the use of wrong assumptions and problematic data.

This does not mean that every study of Oregon State University was without value. Wolf's team went a step farther when they looked for the characteristics of the outbreak of disputes over water. They found a correlation between the development of a dispute over water and high population density, low GDP, low financial activity indexes, previous hostile relations between neighbors, the presence of many minorities in the common drainage basin, and also development and construction of waterworks in the drainage basin, including dams and water carriers (Yoffe et al. 2003).

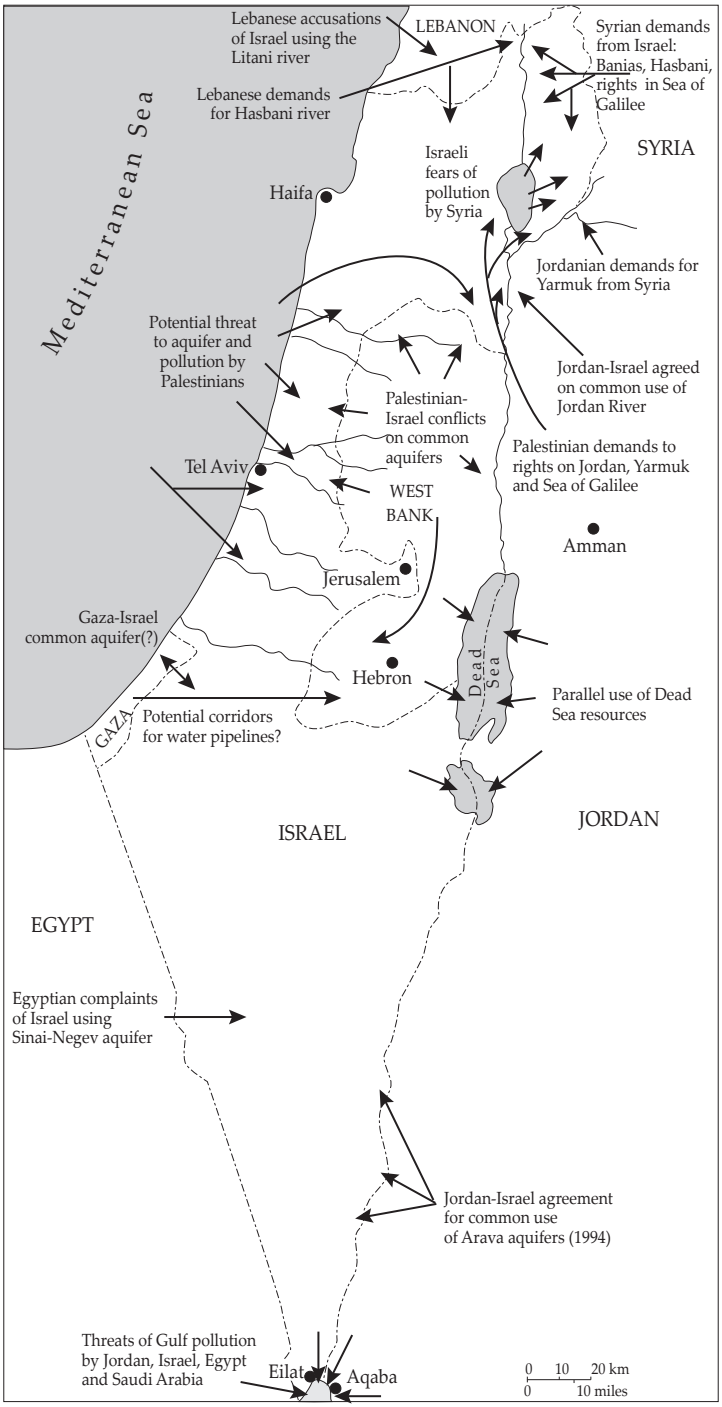
So not surprisingly, based on these data the semi-desert Middle East, undeveloped, populated by tens of millions of people of scant means, locked in ethnic, religious and communal conflict, political and geopolitical disquiet, and disdainful of good neighborly relations, occupies a prominent place in the list of violent regions in dispute over water.

Nor is it surprising that Israel, unique among its neighbors which possess the most conflictual drainage basins in the world (Nile, Euphrates-Tigris, Jordan), has won a salient place in the database due to the meticulous media surveillance of all the country's struggles, conflicts and wars (Map 1).

The potential for conflict exists in Africa, Asia and South America as well. But the researchers highlight the Middle East and Israel to such a degree that the impression is created that water wars are the business of Israel and its neighbors alone.

The conclusions of the Oregon State University team have won extensive international acclaim, and loud media noise, among other reasons because their optimistic statements have fallen on ears yearning for "messages of peace," "fellowship of nations" and "peaceful coexistence" (Barnaly 2009; Ahituv 2014).

The questions that critique the foregoing conclusions concern the databases' problematic nature, particularly regarding the factors that constitute them (their



Map. 1. Hydropolitical circles in the Eretz Israel (Palestine)

different scales, their historical-geographic-media coverage, etc.). It is worth mentioning that almost two thirds of the moderate conflicts, which were resolved by peaceful means and to the satisfaction of all concerned, were over minor problems (wells, resources, empty threats between neighbors…), while only the remaining third concerned major conflicts.

Clearly, there is a difference between a local event, even if shots were fired, and a conflict over the water of the Euphrates or of the Nile, in which billions of cubic meters of water, millions of people and dreadful direct or indirect wars were involved. One may ask if a substantial number of events perhaps belonged to a single series concerning the same water source—for which eventually a peaceful settlement was or was not found; while different events within this same framework entered the statistics under different sections and sub-categories: for common water sources have been fought over for generations. Or in a considerable number of the events is water perhaps only the pretext for a clash, and not its direct cause?

These are not rhetorical questions. Through them, doubt may be cast on the relevance of the databases, of the research findings based on them, and of course also of the conclusions arising from them.

On definitions and databases

Our argument here is that the creators of the two databases erred in that they did not determine precisely what a war over water is, what events come under this rubric, or when the event is a struggle, a conflict, or only a minor happening, an isolated incident, or even media spin remote from reality. This is so, despite the many sub-categories under which are tagged the various events in both databases, or the measurement of the level of violence in water matters.

The term "water war," which is accepted by researchers and clearly formulated in academic terms, hardly exists, although it is in fairly common use—not only by academics but also by the public, the media and politicians. Similarly, the notion "conflict over water," which is recognized by the UN and other international factors, is not entirely clear; like "water war," it carries diverse connotations, sometimes with a marked emotional charge.

Even its accepted definition itself is too general, vague, and sometimes speculative. One hears, "a conflict over access to water resources (mainly freshwater, such as rivers and lakes) and their use among states, political entities or bodies that compose them, or among groups or individuals…" This definition does not indicate that conflicts over water, as defined in the literature, may be complex: major, secondary, or entirely unconnected. They could be deliberate or unintentional, part of a conventional or non-conventional war, be elements in a diplomatic contest, "hostages" serving elaborate geopolitical interests, or perceived simply as terror acts.

A water dispute may be known and well communicated to the general public, even if it is very small-scale. On the other hand another dispute, despite its size, significance and global implications, may get just a couple of lines in the public or academic discourse—if any, or be wholly concealed or camouflaged.

A water dispute is not limited in time: it could be fleeting or permanent, conducted with or without intervals, end at once there and then, proceed for a short while until resolved (partially or completely), or resurge after a period of calm or agreement, and do so several times. The example of the Nile is foundational (as will be detailed later), although the many events that appear in the two databases refer to disputes over its water in different contexts and with different connotations.

Nor is the databases' usage of "water resources" unequivocal. Water can be of any kind, with diverse characteristics and purposes: not only river and lake freshwater, but salt or briny water, "grey," flowing, sewage, or surface water, or water found in aquifers or accumulated in a non-liquid state (glaciers), renewing or non-renewing. In addition, disputed water resources directly or indirectly concern a wealth of other issues that may foment or aggravate a quarrel, constituting its major, integral, accompanying or marginal component. Thus water may concern agriculture (including sheepherding, fishing and food security), infrastructure (canals, dams, and hydroelectric power stations), transport in all its forms, and of course national security (borders, territorial disputes, terror threats). The list can go on far beyond this, touching on almost every aspect and dimension of modern societal life.

But the most important issue for the precise definition of wars over water is how to measure events by the following criteria: volumes of the disputed water (a well with a discharge of tens of cubic meters of water as against a river, lake, aquifer, etc., with a discharge of billions of cubic meters); the magnitude of harm done to the population and the economy, and of loss of life, since warfare, struggle, dispute or clash can touch on the lives of a few dozen people or of many millions. No less important are the dimensions of the developing conflict (an isolated incident or all-out war). Also essential is a precise definition of the threshold conditions that have led to war, and the cause or pretext that may account for the onset of struggles and wars (e.g., blocking a river, or installing conflictual infrastructure, such as a pump, a dam, a canal or a turbine). Keep in mind that not every such action causes a conflict, and not every event which is perceived as striking at neighbors is necessarily that, according to international law or other understandings.

The definition of a water dispute often implies a threat whose realization is not necessarily possible in terms of moral norms or international law. The destruction of the Ruhr region in 1943 or of the Holland dams in 1943 in the setting of World War II were acceptable options; while Israel, in its actions in Egypt, at Nag Hamadi or Isana, or with the threat of damage to the Aswan Dam in order to reduce the violence on the Suez Canal, was far more balanced, refraining from actual destruction, and won real achievements only through extortion, threat, or minor damage to a small facility; all these served to signal weighty problems elsewhere. And again, there arises the problem of defining these events in the databases, for it is not always clear where an event begins, where it ends, and if indeed it has anything to do with water, whether it will end in agreement as part of an overall settlement of some dispute, or will become yet another item in the complex geopolitical relations between the parties.

By contrast, a one-sided action, without warning or justification, by the "neighborhood bully," such as Turkey or Egypt, which exploit most of their rivers' water at the expense of their weak neighbors, apparently does lead to a war or a conflict (examples follow) (Maps 2-3). The problem is that in both databases reviewed here an action such as this and its implications can be recorded as a verbal controversy, as submission of the weaker party, or as agreement.

No less important is how media noise elevates a local and at times entirely esoteric event to the main headline, while a truly dramatic event does not enjoy any attention whatsoever and remains in the shadow. The "CNN effect" has already been noted above, but it is important to raise it again in the context of the databases. There is great doubt as to whether a controversial well in Mauritania, or a canal dug in the time of the USSR or China under the rule of Mao, will ever be inserted into them—not to mention the disasters in the domain of water in southeast Asia at the time of the inter-bloc struggle, or in South America controlled by juntas of all kinds. Anyone who does not apprise us of all these things, labels them incorrectly, and/or does not enter the data into the databases, voids their information and their statistical processing of any practical importance. To illustrate we may take the question of transfer of water from Israel to thirsty Jordan, which moreover has received into its terrain hundreds of thousands of Syrian refugees (Proctor 2014). In the first stage Israel transferred three million cubic meters of water as aid to the Syrian refugees (Berkovsky & Soffer 2013). In 2015 a further transfer of several million more cubic meters was reported (Israel Water Authority 2015, verbal communication). The following question is rhetorical: how, if at all, is this deed recorded: perhaps as part of its war with Syria? Another question again touches on the problem of definitions: if the event has been recorded, under what subcategory—a dispute over water or an agreement? And among which states? Use of water for military or for geopolitical purpose? Is Syria included in the discussion, or only Jordan and Israel?

To be clear, we note that between Israel and Jordan there is cooperation on water, but there is none between Israel and Syria—although Israel supplies water for Syrian citizens located in Jordanian territory.

The definition of conflict noted that water quarrels arise from a clash of interests (public or private) of the water's users. Here too lies a wide array of interpretations. The kinds of user, or of those with interests in the water, are almost unlimited, both within the state and outside it. The parties to the dispute may be ordinary citizens, business elements, public bodies, security factors (army, police), legal personnel, and of course geopolitical entities with their innumerable representatives. A dispute over water can also arise on account of a third party, which physically is wholly unconnected to the disputed water, but which incites the parties that are

connected with it to be in continuous conflict. The best illustration of this is the attempt by Syria, backed by resolutions of the Arab League, to build diversion installations for water flowing into the River Jordan and Lake Kinneret (1964-1966). This effort led to publications holding the view that most "water wars" were linked to Israel; that is how it is recorded in the two databases.

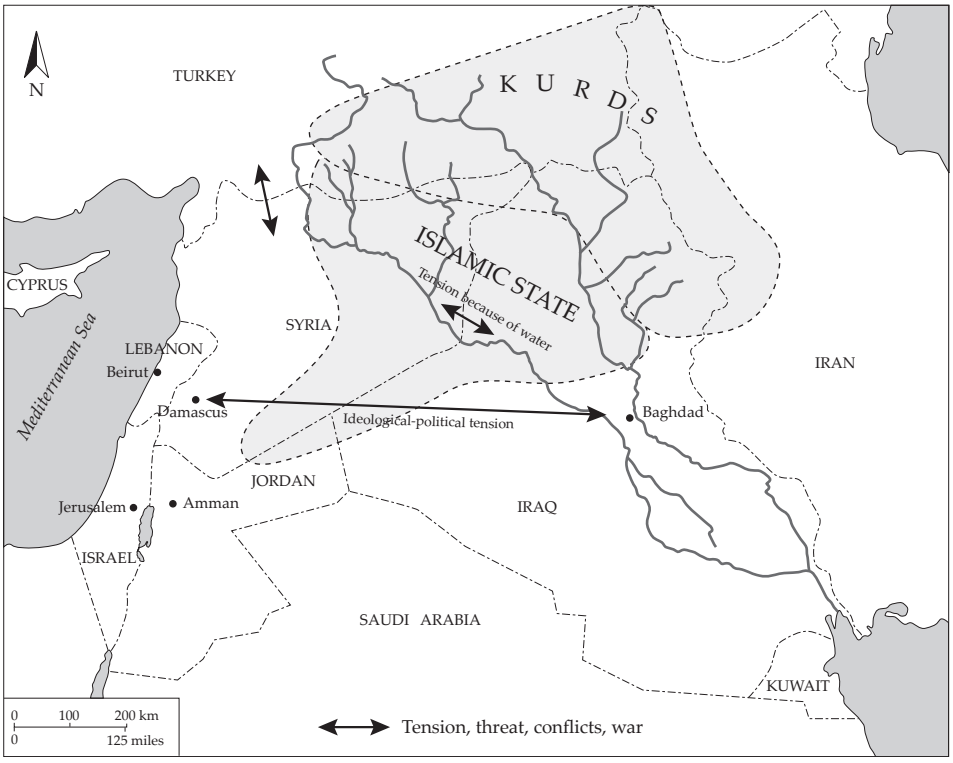
Nor is there any limit to the physical-geographical range of conflict over water. It is not bounded merely by recognized or unrecognized borders of the resource's possessors or users. Usually it is taken to be the spread of drainage basins, which cut across international or internal administrative borders; but sometimes the area of the conflict extends beyond, as transfer of water to distant regions became commonplace in the 20th century, and remains so in the 21st. An example of this is found in the Pacific Institute database, although it refers to the intra-state type of conflict, and is dwarfed by the issue of disputed water of common international drainage basins. The documented event concerns Iran. Farmers of the town of Varzaneh in the Isfahan district embarked on a struggle against a government decision to transfer their water to the nearby Yazd district. It led to a civil uprising, and to damage to the water pipeline. In clashes with the police hundreds of people were wounded and arrested. The disturbances were sparked by mistakes in planning the water regime and disagreement over water resources in a drought year—and not by the problematic economic-political situation created by the ayatollahs' regime (Javedanfar 2013).

Several more examples of the insights presented above are drawn from the Pacific Institute database. The Sudanese Darfur region, where fierce ethnic and religious clashes were recorded that caused hundreds of thousands of dead and wounded, appears but twice in the database. The first reference is to the overall conflict from 2004 to 2007; the second reviews an isolated event in 2014, where members of an Arab militia invaded a refugee camp, looted it, murdered the local leadership, and among other things destroyed the wells. By contrast, between 2004 and 2014 Israel is recorded five times in various contexts: from the reciprocal bombing of water installations in the second Lebanon war and the fear that as a result Israel would wish to use the River Litani water (Murphy 2006), through a shortage of consumer goods in Gaza due to an "Israeli embargo" (Oxfam 2007), to fear of an attack by Israeli settlers, who allegedly struck a well in the village of Qasra on

the West Bank (Bsharat & Ramadan 2011). To reveal the problematic nature of the databases and how they classify the events they contain, we next present two test cases wherein we juxtapose the foregoing instances, which are of local concern, to two others of great local and global importance.

The case of Turkey and the Euphrates-Tigris basin

As early as the 1960s Turkey resolved to advance a grandiose plan on the Euphrates and the Tigris, raising 22 dams to irrigate thousands of square kilometers, and building 19 hydroelectric power stations on the rivers. Entirely one-sidedly, with no negotiation and barely any prior notice, Turkey appropriated 50% of all the Euphrates water, leaving two downstream states—Syria and Iraq—the remaining 50%; note that the latter countries have used Euphrates water for five millennia, and are desperately in need of it. They lie in a desert or semi-desert region; by contrast, Turkey enjoys much better conditions (Soffer 1992, 1999, 2006) (Map 2).



Map. 2. Hydropolitical tensions in the Euphrates-Tigris basin

The question is how this case was to be catalogued in the Oregon State University database. The problem is that any kind of classification would be problematic, as this case may be placed under the rubrics verbal dispute, quiescent dispute, or peaceably resolved dispute, as not a single shot was fired in it. Nevertheless, here is an act of barbaric violence by the "neighborhood bully." A further problem is disregard of the measure of the event—a conspicuous omission in both databases. Thus the puny documenting of Turkey's unilateral acts dwarfs them when set against the hundreds of marginal events, regardless of the volume of water involved in the Turkish case, the huge size of the populations affected, and equally important the geopolitical, economic and other implications of this piratical action, whose ancillary aspects are alive still today. At issue here is the Euphrates river, with some 32 billion cubic meters of water, with its populations of 50 to 60 million people in the river basin and its tributaries, as against a plethora of minor cases in the database, such as the well where at issue were several dozen people—if that—who were harmed, and a daily or monthly discharge of several cubic meters of water whose damage affected several dozens of people—albeit not making light of the disaster for each and every one of them.

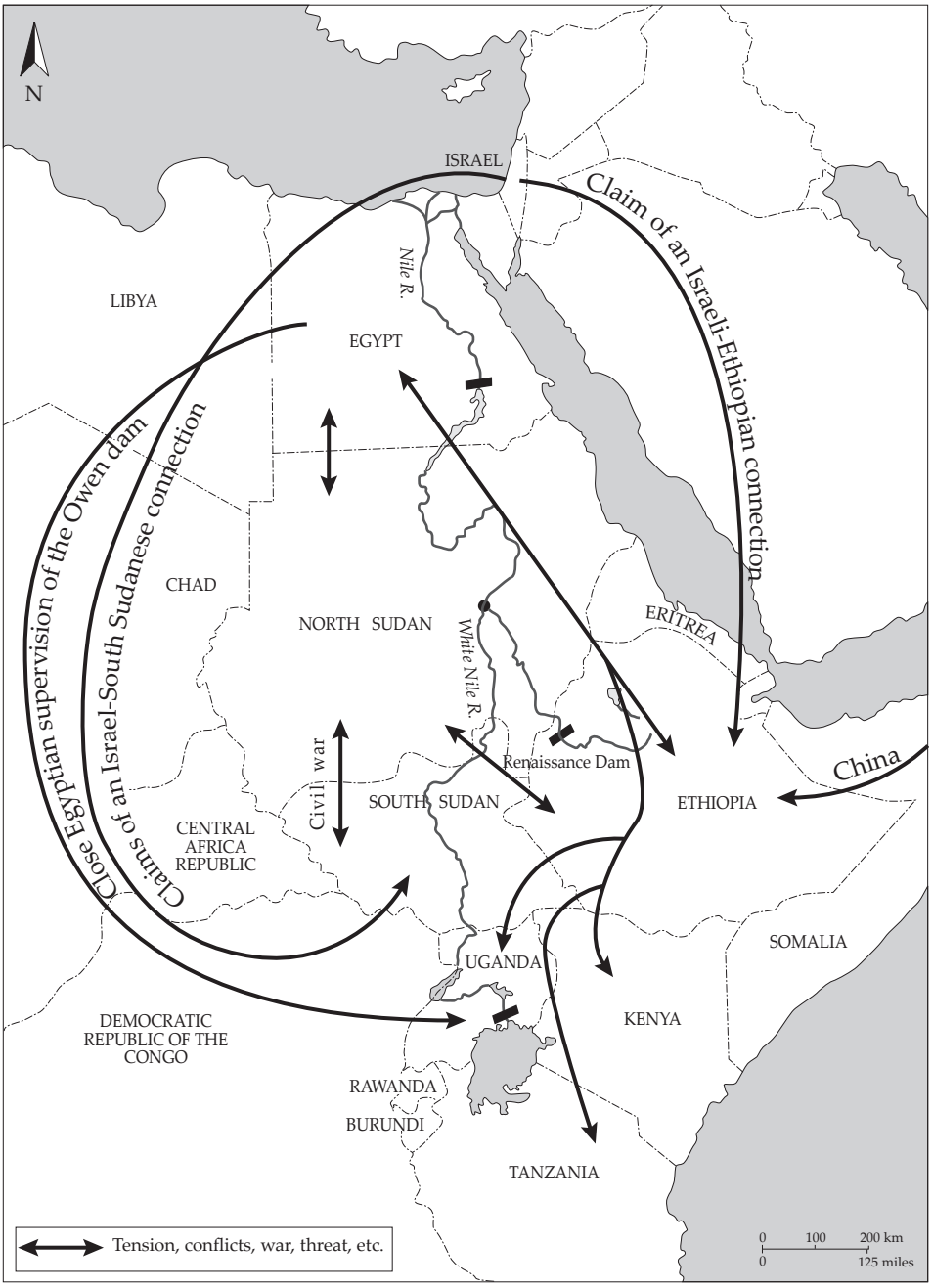
Still today not studied precisely are the implications of the Euphrates damming for the outbreak of regional wars in Syria and Iraq and the rise of Da'esh—Islamic State-IS. Could the event and its reverberations perhaps still exert an effect to this very day (2016)? The Syrian civil war started (in the present authors' view not by chance) in the Kamishli region, on a Euphrates tributary called Habur, which dried up entirely (among other factors due to the destructive Turkish action) and also in a strip of land near Dar'a in the south, which suffered prolonged drought (Berkovsky & Soffer 2012, 2013). One may speculate far beyond this, and ask this question: is IS's capture of the dams on the Syrian and Iraqi Euphrates a separate matter? Or again, is it an offshoot of the Turkish brutality, for many IS militants passed through territory of Turkey, whose pro-Islamic policy contributed its share to the civil war in Syria. Another question is not speculative at all: is IS's takeover of the dams a casus belli, or an act of terror which utilizes water infrastructures, as described in the Pacific Institute database? Or is it an expression of an intra-state conflict, and perhaps is not a violent event at all?

The case of Egypt and its neighbors in the Nile basis

The other test case is the Nile basin. For about 90 years (1927-2016) Egypt has applied its military and political strength, and has utilized Sudan's support, to prevent all other partners in the Nile basin from using its water. The greatest injustice is evident in the case of Ethiopia, which contributes more than 80% of the Nile water (the Blue Nile), while that country itself is forbidden by the 1927 and later the 1957 agreement to use any of its water at all (Soffer 1992, 1999, 2006; Berkovsky & Soffer 2014a) (Map 3).

How is this case recorded in the databases? Like the foregoing, any categorization will mislead. A dormant dispute? A violent dispute? Extortion? Perhaps it shouldn't appear at all? The Oregon State University database has not yet been updated (the latest event is for 2008) and we do not know how it will be treated. Be that as it may, here is a matter concerning billions of cubic meters of water needed by more than 200 million people (in 2015!). In Gleick's database this case is treated by the same yardstick as the destruction of a well in a remote village. Furthermore, the course of this conflict has not been updated: developments on the Nile issue are entirely absent. After decades of inertia Ethiopia resolved to initiate actions that would bring the situation and the disregard of its rights to an end. With foreign aid, mainly Chinese financing and Italian technology, Ethiopia has begun to build a series of dams on the Blue Nile. The first enterprise is called the Grand Ethiopia Renaissance Dam. It is located 48 kilometers from the border with Sudan, and the reservoir is intended to contain 63 billion cubic meters of water, with the discharge generating electricity from the nearby power station at 5250 megawatts (Berkovsky & Soffer 2014a). And again the same thorny questions: how should this conflict be defined? As one integral event? As ten? As an event that should be treated as a dispute over water infrastructures only? Considering the volume of water involved in the dispute, the population size, the amount of electricity and the geopolitical implications, we have here a situation tens, or even hundreds, of times greater than the cases in the entries of Gleick or of Oregon State University.

Here too speculation is inevitable, arising from recent events that have not been given precise definitions in the databases. What is the weight of Ethiopia (in cooperation with the southern states of the Nile basin) in the emergence of the



Map. 3. Hydropolitical tensions in the Nile basin

"Arab spring" in Egypt, and in the breakdown of Egypt's development projects in Sinai and in the Tushka project (the "new valley") in southern Egypt?

Few are aware that in the demonstrations against the regime in Egypt in the course of the "Arab spring" the shortage of water, and its poor quality, played a significant part.

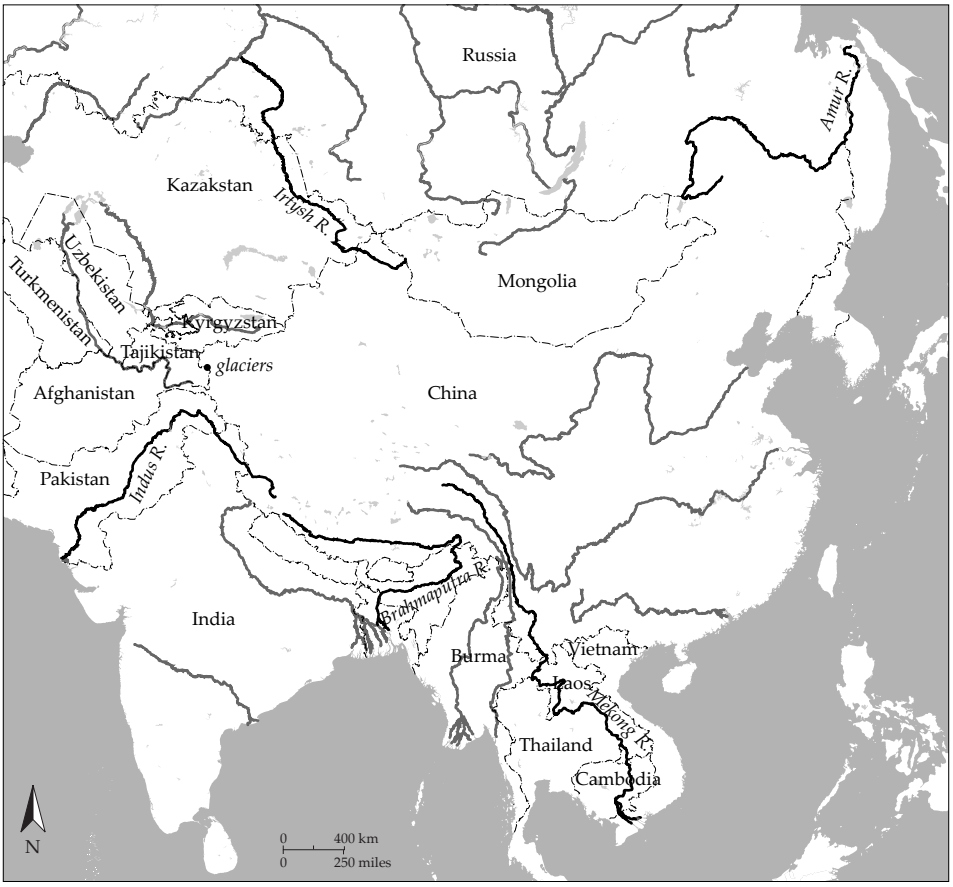
Gleick's database refers to these, but does not disclose the full picture or their connections to the complicated circumstances set out above. And indeed, in 2012 in several Egyptian cities demonstrations against the water shortage and its poor quality for irrigation and drinking were documented. Along with assurances by the regime of improvement of the situation, the demonstrations were suppressed, with casualties (*Ooska News* 2012). As against this, the following event did not appear in the database: outwardly, Egypt did not threaten formal war against Ethiopia because of the latter's ambitions regarding the Blue Nile water; but in October 2012 the WikiLeaks website (*Al Arabiya* 2012) published a document describing preparations by Egypt to prevent by military means the independence of South Sudan and even to blow up the Renaissance Dam in Ethiopia.

These plans did not materialize, but the photography of Google Earth affords us a new insight into the Egyptian plans for war against Ethiopia: at the Abu Simbal site near the Egyptian-Sudanese border the Egyptian air force has converted the airport of this world tourism site into a military airfield for attacking Ethiopia—in addition to the preparation of Sudanese airfields for this purpose (Ayeb 2013).

More examples

Additional examples are to be found of water crises that can escalate into warfare. All are presently active, some in the Middle East, others in different parts of the world, some are unresolved and have been subjected to unilateral decisions by the side that is stronger (politically, militarily, economically), which treats water belonging to others as it own.

Such is the case of China's relations with its southern neighbors regarding the River Mekong or the Brahmaputra; Chinese geopolitics even plans to exploit India's relations with Pakistan regarding the shared River Indus (Map 4). But it is



Map. 4. Hydropolitical tensions between China and Neighbors

the same with its neighbors to the north—Russia and the central Asian states, the former Soviet Union. Water development projects in China are liable to empty the River Irtysh—a water body among the biggest in western Siberia, whereby Russia and Kazakhstan will be harmed. No less impressive plans has China for water sources from the glaciers that feed Tajikistan. In the Russian Far East the Chinese are making progress toward exploiting the River Amur water. And China is not alone in its appetite for its neighbors' water. Any observer of US behavior on the Colorado river across from Mexico will discover activity no less brutal and inconsiderate.

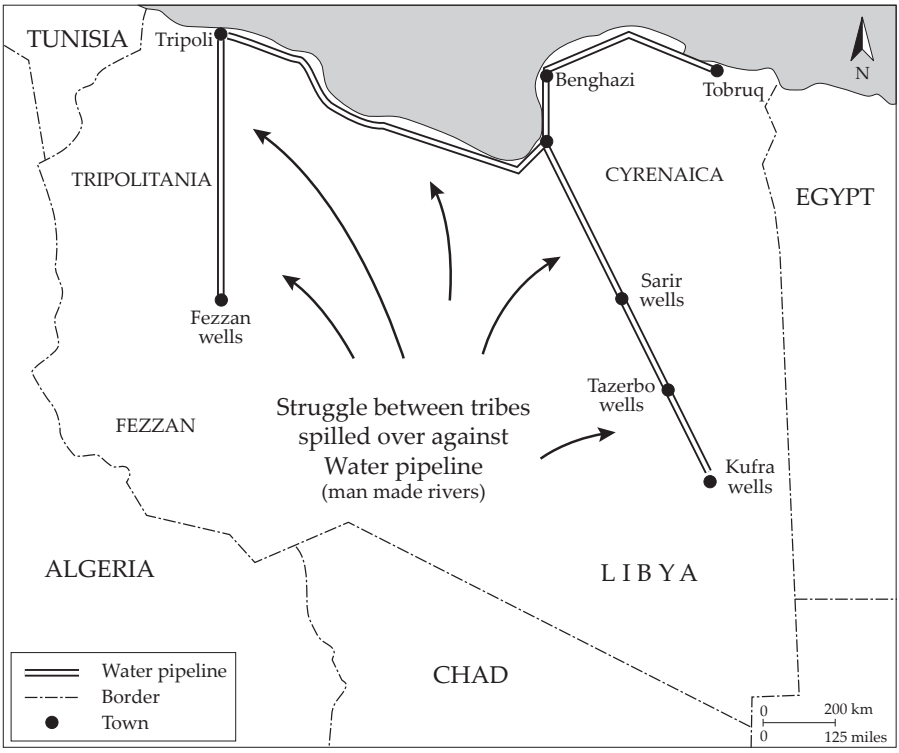
These conflicts do not hit the world headlines despite their geopolitical implications, their embrace of vast areas with millions if not billions of people. At best, they feature as impending conflicts with a high potential to erupt (De Stefano et al. 2012).

Before drawing conclusions, we may refer to events that do feature in the Pacific Institute database, but are not yet thoroughly analyzed. Such are the events of the "Arab spring," in respect of disputed water and of the grave implications that have already been seen in the present and will be more painful in the near future. These events merge with the "troubles" of the Middle East, which already have made its survival and development problematic. At issue is an acute water shortage, with implications for irrigation and drinking water, unending population increase and migrations in the region, collapse of national states and rise of various tribal factors. Similarly, one cannot ignore climate change, which though slow is a catalyst, a pretext or an ancillary factor for these problematic developments (Scheffran et al. 2012).

In the framework of the "Arab spring" water, already in short supply, has become a weapon in the strife of all against all. This has happened in Libya. In the early time of the insurgents' confrontation with forces loyal to Qaddafi, they cut off the water supply to the city of Tripoli and its surroundings (UPI 2011). After the fall of Qaddafi, local tribes began quarreling among themselves and in their warfare they adopted the "water weapon" for arms (Map 5). The struggle between the Zwai and the Tebu tribes spilled over into real threats against Libya's main water carrier, the "artificial river," which takes water from the Libyan desert to its coastal cities. The tribes cut off the electricity for the large water pumps, so millions of Libyans were left without potable water (Adel 2014).

In Yemen aquifers, wells and water pipelines, including those carrying water to the capital San'a, have been taken "hostage" by the forces fighting in the country. They have no qualms about damaging the current supply, or even of wrecking vital infrastructures (Friedman 2013; UN 2011).

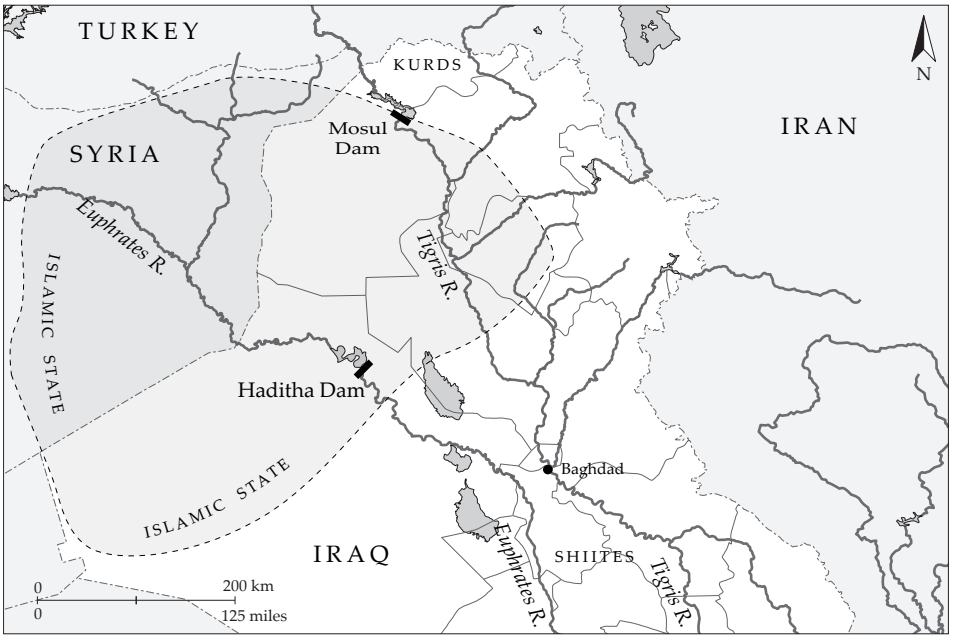
Syria's civil war has left its mark on the water regime of its big cities. Taking control of the Tishrin Dam on the Euphrates in 2012, the rebels left Damascus without electricity (Mroue 2012). Aleppo's water supply system has been destroyed



Map. 5. Libya - the great man-made rivers

several times under various circumstances by diverse forces (of Assad and of those fighting him). Priority has been given to blowing up pipelines and pumping stations that supplied water to more than two million residents of the city and its surroundings (Femia & Werrell 2012; *BBC* 2012).

The picture that emerges from conflict-ridden Iraq is also wretched. In 2014 the advance of IS toward the Haditha Dam, on the Iraqi Euphrates, intensified fear of damage to the dam or its deliberate opening aimed at achieving a tactical or strategic advantage (Coles 2014) (Map 6). This is the second largest dam in the country, from which hydroelectricity is generated for millions of households. Its opening is liable to "drown" entire regions. Freely flowing water could reach as far as Baghdad, which lies about 180 kilometers southeast of it. This holds also for the Mosul Dam to the north and for smaller dams in the north of the country (Cooper, Fahim & Chivers 2014).



Map. 6. Dams as hostages between Islamic States and Neighbors

Conclusion

The plethora of authors writing about water wars, in their diverse contexts and from different viewpoints, without defining precisely what they mean, and disregarding the size of the events, "inflates" matters because the events referred to and catalogued under this heading are heterogeneous in the extreme, to put it mildly. They touch on a welter of areas of science, from the physical-geographic aspect through the demographic to the economic-geopolitical. Already in respect of this mass, academically speaking one might imagine that "water wars" are a curiosity that hardly exists, when in fact the multiplicity of small, marginal and insignificant events conceal the major—albeit few—water conflicts.

How can one liken the dispute over the Indus water, even one percent of it, with a discharge of 207 billion cubic meters annually, affecting the lives of hundreds of millions of people in China, India and Pakistan, to an isolated criminal event concerning an illegal well, with a discharge of hundreds of cubic meters, serving a clan numbering a few dozen people only, near Hebron? We shall not enlarge here

with more examples. We simply sum up the other parameters that highlight the problematic nature of the definitions.

Not all quarrels which apparently started with water, or were about this resource (its shortage, distribution, damage to its quality; construction and use of infrastructures for it, etc.) are "water wars" pure and simple. Even without the issue of water, other causes and pretexts have been plentiful: strife over land and other resources, religious and ideological incitement, and so on. In addition, not all the "wars"—if they actually broke out—reached the stage of armed conflict, massive or partial. Some were exhausted immediately, others were satisfied with a show of force, with threats in the international diplomatic arena, with lawsuits and arbitration on various levels, or even with media wars "awash with ink" and replete with cursing and accusations. Quite a few ended in agreement. Still others, in the past and today, were conducted in the manner of a "cold war" or a "lukewarm war," lasting decades despite various agreements, when the forces involved do not always fight battles, but nor are they ready to end the conflict; instead they continue to play the powerful threat card in an issue so acute as water.

Moreover, in recent years "water wars" have changed qualitatively. Instead of a resource whose access or quotas are fought over, increasingly widespread is the use of water itself as an active weapon between the sides, a usage that can harm the water resources and even cause them significant damage. We have exemplified this at length. After pointing out an excess of questions that still await attention in discussions on the definition of war, crisis, or conflict over water, we illustrated the problematic nature of the databases we examined. Because of the great presence of the Middle East in the events appearing in them (the "CNN effect," but not that alone), one gets the impression that "water wars" erupt and are fought apparently for the most part between Israel and its neighbors; in other countries of the world, it would seem, water disputes are fewer, are generally resolved by agreement and do not lead to actual violent clashes.

By highlighting the problematic nature of the databases of the research teams at Oregon State University and at the Pacific Institute in Oakland, we question this claim. Similarly, we have shown by our examples that the conclusions of

the Oregon State University team are hardly acceptable in their minimizing the dimensions of the violence connected with international conflicts over water. We have shown that not all conflicts are recorded in the databases, that not all events that are essentially conflicts over water are properly categorized, or are placed in a number of categories in parallel; and if they do appear, their broader context is absent, there is no yardstick to measure the events, and all concomitant implications are ignored.

We have shown that it is possible to fight over water without firing even a single shot, when a strong and violent state appropriates large volumes of water manifestly unilaterally, while weak states in the basin are too fearful to rise up. To this end two test cases were presented: Turkey against Iraq and Syria, and Egypt against Ethiopia. We also pointed out China's one-sided deeds, as well as the action of the USA in Colorado against Mexico.

With these examples alone we touched on more water and more people who have been harmed in conflicts than in the hundreds of small conflicts with which the statistical databases are inundated. The effect of these small conflicts on the quantities of water or the hundreds of water casualties pales into insignificance, of course, against the few events that we have indicated, whose global effect is truly enormous.

In the article we also asked a troublesome question: how does one weight the series of events of the "Arab spring" in the Middle East among the distressing characteristics of the region, more especially in the context of water and its accompanying conflicts, natural increase, migrations, climate change, collapse of systems, and so on? We asked if these are part of a conflict over water or something entirely different. The examples showed that the answer is yes, they are part of the conflicts over water.

We close with another pessimistic vision. Rapid population growth (mainly in third-world countries, more especially the Middle East), and decrease in the supply of water for various reasons (climate change, pollution, geopolitical changes), bode the continuation of water struggles, and even their worsening (Hendrix & Salehyan 2012).

Why do we have reason to be concerned about this?

In 1978 the UN documented 214 international drainage basins. By 2002, 263 international basins, and an unknown number of aquifers, were counted in the world that crossed international orders. By 2015 the number had risen to 273 basins, and 300 international aquifers had been discovered, because new entities and states were added to the world's political map such as Kosovo, Abkhazia, South Ossetia, South Sudan, and other geopolitical entities and unilateral annexations not formally recognized by the international community (a fresh example: everything taking place in southeast Ukraine and the Crimean peninsula).

To substantiate the threat, there is no alternative but more statistics. About 60 percent of all conflicts and joint drainage basins arise due to the volume of water that each state is permitted to take for itself. Thirty percent more of the conflicts have to do with laying down infrastructures for the exploitation of the water. Since the 1940s, close to 45,000 dams have been constructed in the world, and innumerable accompanying infrastructures, including those intended for electricity generation. The building upsurge is yet to abate. In such a situation, not all conflicts will be solved, and new ones constantly erupt, mainly in third-world states determined to promote their peripheral regions and to realize their rights, neglected in the past.

In light of all the foregoing, we stress that the seemingly optimistic conclusions of the team at Oregon State are extremely dubious. The importance of conflicts over water should not be underestimated as leading to violent confrontations, but nor should we forget that conflicts over water converge with conflicts over other vital resources as well.

We opened the article with the title "Is water indeed not being fought over?" Our response is that it certainly is being fought over—and very much so. The question is how to distinguish the wheat from the chaff, how to define and enumerate these wars correctly.

As we have stated, it was not our intention to alter paradigms. We may just note that insertion of measures of volumes of water discharged and size of populations that we discuss can assist in distinguishing marginal cases from central ones.

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