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Water Wars or Water Peace?

Rethinking the Nexus between Water Scarcity and Armed Conflict

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Contents

Preface

The assertion that wars in the Middle East are just as likely to be fought over water as over oil continues to be widely heard, especially in the realm of policy-making. In academic circles, however, the initial enthusiasm of the 1980s has subsided considerably in the face of continued research questioning the adequacy of the 'water wars' hypothesis. Do existing regimes not demonstrate that water could also have cooperative potential? Ought one not speak of 'water peace', rather than of 'water war'?

This Occasional Paper revisits the 'water wars versus water peace' debate. It asks the question why, in the face of a clear epistemic consensus in academia in favour of the 'water peace' hypothesis, the public discourse retains its belief in the threat of interstate conflict over water. Philipp Stucki investigates potential reasons for this, and in light of his analysis, proposes ways in which the concept of water peace could attain broader acceptance.

Entailed in this study is a reply to Occasional Paper Number 1 of this series. There, Rolf Schwarz analyses the Israeli-Jordanian water regime in the Jordan River Basin, observing that agreement on individual issues such as access to water resources could be reached even without the resolution of the overall conflict. The lesson to be drawn from the Israeli-Jordanian water regime, Schwarz claims, is that deadlocks in the negotiation process may be overcome by breaking down the conflict into a series of resolvable disputes over specific issues. Stucki, however, questions whether the Israeli-Jordanian water regime was indeed the consequence of a change in perceptions by both sides, as social constructivist and liberal models would predict. Was agreement over water due to a change in negotiators' patterns of behaviour, i.e. as a result of them no longer perceiving the bargaining process over water as a zero-sum game, but rather as a (liberal) win-win situation? Philipp Stucki shows that other reasons may offer a better explanation for accomplishing a signed agreement. If a change in perception actually occurred, he argues, we should expect a stronger alteration of the political discourse on water scarcity, and a more profound reallocation of water resources at the national level. Stucki supports the view that mutually beneficial agreements are possible, but sees the main impediments to such agreements in the existence of strong domestic coalitions, which frame the national discourse over water and thereby defend current allocations of water resources.

By focusing on such constraints, Stucki implies that the perceived centre of dispute may not lie at the interstate level, but rather in the securitisation of a specific issue embedded in a domestic political discourse pertaining to the overall conflict. Herein lies

the flaw of the water war hypothesis. For the media and political rhetoric, talk of water wars may be more fruitful than the notion of water peace. Yet history teaches us that rather than wage war over the resource, nations have instead shown a surprising degree of willingness to cooperate on this issue. This is a lesson that definitely seems worth remembering.

Keith Krause
Director

Oliver Jütersonke
Series Editor

The author

Philipp Stucki is a Ph.D. Candidate and Research Assistant at the Graduate Institute of International Studies in Geneva, Switzerland. Previously, he had received an M.A. in Economics of the Middle East at the University of Erlangen-Nürnberg. His academic interests focus on the institutional design of multilateral and regional trade agreements, and on the Political Economy of the Middle East.

The author not only has an academic interest in the political processes in the Middle East, but has gathered practical experience through serving as an international observer in Hebron (Palestine). He is a member of the *Swiss Expert Pool for Civilian Peacebuilding* (SEP) of the Swiss Department of Foreign Affairs.

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1

Introduction

The 1980s were marked by a paradigm shift on how armed conflicts in the Middle East (not only, but primarily in that region) had to be understood. Future wars would not be explained by cultural, religious, or political differences, but by the struggle for vital resources. Resourced-based explanations for conflicts in the Middle East were not entirely new, but instead of a focus on oil, water was now the *one* resource attracting most of the attention. Moreover, the debate about 'water wars' was one of the building stones in the broadening of the security agenda into human and environmental security. Yet apocalyptic prognoses of water wars could not only be heard in academic circles, but were also quickly adopted by practitioners in international organisations, by political decision-makers, and by the media. The deterministic reasoning inherent in these statements made water wars seem almost unavoidable.

It took ten years for a new wave of literature dealing with water scarcity to emerge. Not only were the existing arguments in favour of water wars refuted for being over-simplistic, but these new authors also tried to show what cooperative potentials could be found in the international management of a scarce resource such as water. The new perspec-

tives on the nexus between water scarcity and potential conflicts (also called 'water peace' literature) were very successful in academic circles, and can be said to currently represent an *epistemic consensus*. However, not much has changed outside of the scientific debate. In March 2001, UN Secretary-General Kofi Annan still warned of future water wars. In the media, the fear of water wars is still expressed regularly, and little can be found concerning the cooperative potentials in dealing with water scarcity.

The aim of this paper is to give an overview of the 'water wars vs. water peace' debate. It tries to show why the water wars hypothesis, although being refuted in academic circles, is still dominating the public debate. It then discusses what the consequences of its prevalence might be.

Chapter 2 mainly focuses on the underlying assumptions of the water wars hypothesis, and tries to embed it in the scientific debate. Furthermore, it raises the question whether a water-related armed conflict can be portrayed as a struggle for survival or whether it is, like most armed conflicts, rather an outcome of policy failures.

Chapter 3 elaborates on the various arguments that were brought up against the water wars hypothesis. It shows that the supply as well as the demand for water should not be taken as givens. Better resource allocation on the national level can reduce the overall water demand, and effective international cooperation may increase the amount of total supply. The chapter concludes with some empirical cases of international cooperation in dealing with scarce water resources.

As already mentioned above, the water war hypothesis has not lost its relevance despite its poor

acceptance in the current scientific debate. Chapter 4 gives three different explanations for this phenomenon. First, water agreements could only be hegemonic projects that do not incorporate the cooperative potentials suggested by the water peace literature. Second, armed conflicts over the access to water can be expected on the national but not on the international level. Third, the national discourse and practice with regard to water allocation has not really changed despite recent agreements.

In the concluding remarks, the attempt will be made to link some of these arguments synthetically, arguing that the adherence to the traditional discourse about water security might very well be explained as an attempt to avoid domestic conflicts. In addition to this, the conclusion tries to make some recommendations on how the concept of water peace could attain broader acceptance by increasing the exposure of practitioners and the public to arguments showing the cooperative potential in dealing with water scarcity. This Occasional Paper should be seen as a humble contribution to this endeavour.

2

Water scarcity and armed conflicts: the early years

It is not the aim of this paper to add anything to the debate on whether there is a *causal* link between water scarcity and armed conflict. Rather, it tries to assess how and why the 'water wars' hypothesis became so prominent over the past two decades, and what the consequences of its prevalence might be. In order to do so, we need an overview of the arguments for and against water wars articulated in the scientific debate.

A. The water war hypothesis

The year 1984 marked the beginning of a new paradigm in the analysis of the Middle East. The scarcity of water resources became an increasingly accepted explanation for tensions among Middle Eastern states, and the shrill apprehension was heard from various circles that the next war in the Middle East would be fought over water. We have to ask ourselves why such a shift happened at this specific point in time. Looking at one of the first articles published in this context may give us some insights: John

Cooley tries to show how the presence of Syrian and Israeli troops in Lebanon has to be seen through the lens of securing water resources (the Orontes River for the Syrians and the Litani River for the Israelis).[1] He does not write much about the civil war in Lebanon, nor about the various allies and goals the two invading armies had in this conflict. What remains is an explanation completely reduced to the dimension of water resources. This pattern, singling out one element without weighting it against other explanations for conflict, can be traced through most of the literature on (potential) water wars.

Cooley, however, was not alone in his analysis: since 1984, a myriad of (both academic and media) articles and books have been published pointing at the danger of future water wars in the region,[2] or even characterising past wars as water wars.[3] This

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[1] John K. Cooley, 'The War over Water', *Foreign Policy* 54 (1984), 3-26.

[2] Only some of the most prominent contributions are listed here: Natasha Beschorner, 'L'eau et le processus de paix Israélo-Arabe', *Politique étrangère* 4 (1992), 837-55; John Bulloch and Adel Darwish, *Water Wars. Coming Conflicts in the Middle East* (London: Weidenfeld & Nicholson, 1993); Peter H. Gleick, 'Water and Conflict. Fresh Water Resources and International Security', *International Security* 18:1 (1993), 79-112; Thomas Naff, 'Water Scarcity, Resource Management, and Conflict in the Middle East', in Elizabeth Kirk (ed.), *Environmental Dimensions of Security: Proceedings from a AAAS Annual Meeting Symposium* (Washington: American Association for the Advancement of Science, 1992), 25-30; Thomas Naff and Ruth Matson, *Water in the Middle East: Conflict or Cooperation?* (Boulder: Westview Press, 1984); Joyce Starr, 'Water Wars', *Foreign Policy* 82 (1991), 17-36; Joyce Starr and Daniel Stoll, *The Politics of Scarcity: Water in the Middle East* (Boulder: Westview Press, 1988).

[3] Olfira Seliktar, 'Turning Water into Fire: The Jordan River as the Hidden Factor in the Six Day War', *Middle East Review of International Affairs* 9:2 (2005), 57-71.

view was not only adopted by many academics, but also by practitioners: Boutros Boutros-Ghali (at the time Egyptian Foreign Minister), the Jordanian King Hussein, Syrian Prime Minister Hafez al-Assad, and even United Nations Secretary-General Kofi Annan expressed the fear that future wars in the Middle East will be fought over water (and no longer over oil).

All these pessimistic views have one basic analysis in common: water is already scarce in the Middle East and water basins are shared between neighbouring countries. The massive population growth in the Middle East will lead to declining per capita availability of fresh water in the future. Therefore, countries will fight each other to secure the control of the much-needed resource. As straightforward as this analysis may be, one needs to point at the underlying assumptions expressed in this view. First, it is assumed that scarcity can be defined in absolute terms, and second, water supply and per capita water demand are taken to be a given. Thereby we arrive at a strictly Realist characterisation of the issue under consideration, i.e. a zero-sum game. This view is perfectly recapitulated by Thomas Naff:

> In sum, the strategic reality of water is that under circumstances of scarcity, it becomes a highly symbolic, contagious, aggregated, intense, salient, complicated, zero-sum, power- and prestige-packed issue, highly prone to conflict and extremely difficult to resolve.[4]

Yet we have to ask ourselves whether such a view about water availability or water scarcity is tenable. What does scarcity mean? Is there an absolute

[4] Naff, 'Water Scarcity, Resource Management, and Conflict in the Middle East', 25.

measure of minimal water supply needed by an individual? Yes, there is. 125 m^3/year is generally accepted as the absolute minimum water requirement for an individual in his or her household (for purposes of hygiene and as potable water) and in light industry (to earn a living).[5] Even the Palestinians, being under the hardest water stress[6] in the Middle East, have, with 165 m^3/year, more water available than the absolute minimum. But one element is obviously missing in these numbers: how and where is the foodstuff produced to feed this individual? This is the point where the debate starts and we lose the ground of solid numbers. If our benchmark should be the sustainable and self-sufficient production of foodstuff, the water needed per capita in semi-arid climate zones amounts to around 1,000 m^3/year.[7] Yet why should we apply a criterion that not even Switzerland, with an abundance of water resources and capital, is able to meet?[8] Still, the

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[5] Bertrand Charrier and Fiona Curtin, 'A Vital Paradigm Shift to Maintain Habitability in the Middle East: The Integrated Management of International Watercourses', in Green Cross International (ed.), *Water for Peace in the Middle East and Southern Africa* (Geneva, 2000), 11-17.

[6] The term "water stress" was introduced by Malin Falkenmark, 'The Massive Water Shortage in Africa: Why Isn't It Being Addressed?' *Ambio* 18:2 (1989), 112-18. However, the categorisation of water scarcity have been criticised for being too static. See Leif Ohlsson, *Environment, Scarcity, and Conflict: A Study of Malthusian Concerns* (Göteborg: Göteborg University, 1999).

[7] See the UN World Water Development Report, *Water for People, Water for Life* (2003); this amount also includes domestic and industrial use by an individual.

[8] According to these standards, Switzerland would only have the capacity for 1.3 million inhabitants. Source: INFRAS, *Quantitative Aspekte einer zukunftsfähigen Schweiz* (Zürich: December 1995).

MENA region as a whole[9] had, according to the World Bank, a supply of 1,436 m³/year of renewable water resources per capita in 1992.[10] It therefore becomes quite obvious that what we are facing here is an allocation problem; on the one hand within countries (i.e. among sectors), and, on the other, among countries. To speak of scarce resources and growing populations fighting over these resources, veils more than it explains.

B. Contextualising the water war hypothesis

The water war hypothesis did not develop out of the blue, nor is it a concept stemming from Middle Eastern Studies; the Middle East was only its primary field of application. Rather, it has to be understood in the context of the debate on environmental security. The water war hypothesis, however, is not only part of the environmental security literature, but was indeed one of its important building blocks.[11]

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[9] The Middle East and North Africa (MENA) region consists of the Maghreb, the Mashreq, the Gulf countries and Iran, but does not include Turkey, the country with the highest supply of renewable water per capita in the region.

[10] Jeremy Berkoff, *A Strategy for Managing Water in the Middle East and North Africa* (Washington: The World Bank, 1994).

[11] This becomes evident in the chronology of scientific output and in the centrality of the water-conflict argument in the environmental security literature; see for instance Peter H. Gleick, 'Environment, Resources, and International Security and Politics', in Eric Arnett (ed.), *Science and International Security* (Washington: American Association for the Advancement of Science, 1990), 501–23; Gleick, 'Water and Conflict. Fresh Water Resources and International Security'; Thomas F. Homer-Dixon, 'Environmental Scarcity and Violent Conflict', *International Security* 19:1 (1994), 5-40.

The environmental security literature mainly follows a Neo-Malthusian logic articulated in *The Limits of Growth*:[12] resources are limited, and population growth will lead to declining per capita availability of vital resources and to environmental degradation. The environmental security literature then added the Realist argument that people will fight over the control of these scarce resources. Consequently, we find in the literature a constant (but only partly admitted) conflation of *environment* and *resource scarcity*. Jon Barnett rightfully claims that when "the scarce resource can be costed... then the problem is more *economic* than it is *environmental*".[13] The pricing of water is a very common strategy to deal with its scarcity, and it therefore seems questionable whether the issue really fits well into the debate on environmental security.

Another common pattern of the literature on environmental security and the one on water wars is, as Nils Gleditsch argues, that the cases serving as empirical evidence are mostly to be found in the future.[14] However, Thomas Homer-Dixon carried out a study based on historic cases about the relation between resource scarcity and violent conflict; his findings are that the hypothesis that environmental scarcity leads to simple-scarcity conflicts was not supported by the empirical data. He furthermore calls for a differentiation between renewable and non-renewable resources, whereby the former has a looser relation to violent conflict. However, the one

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[12] Donella Meadows, Dennis Meadows, Jorgen Randers and William Behrens, *The Limits to Growth* (New York: Universe Books, 1972).

[13] Jon Barnett, 'Destabilizing the Environment–Conflict Thesis', *Review of International Studies* 26:2 (2000), 271-88, at 273.

[14] Nils Petter Gleditsch, 'Armed Conflict and the Environment: A Critique of the Literature', *Journal of Peace Research* 35:4 (1998), 363-80.

renewable resource most likely to stimulate interstate war was river water.[15] A later empirical study working with a larger dataset and controlling for land contiguity, carried out by Wollebæk, Gleditsch and Hegre, came to the conclusion that "the sharing of international rivers does seem to be associated with conflict between nations, as well as with activities directed at conflict prevention", but no strong statistical evidence could be found for the hypothesis that sharing a river was a major source of armed interstate conflicts.[16] Aaron Wolf makes an even stronger statement: by analysing actual conflicts based on the "International Crisis Behavior" dataset, he can only find a single interstate war fought over water, which took place between the Sumerian city-states of Lagash and Umma in 2500 BC. In modern times, he only finds seven minor skirmishes in which water played a significant role.[17] He contrasts this small number of minor eruptions of violence with 3,600 agreements signed over water in order to show the cooperative attitude actors chose in dealing with disputed water resources.

The environmental security discourse started in the early 1990s. This was not a mere coincidence, as the post-Cold War period needed a new paradigm for framing *security*. Consequently, the environmental security debate was warmly welcomed, foremost in circles of the (US-) security complex. The Malthusian logic inherent in this debate allowed for a certain de-

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[15] Homer-Dixon, 'Environmental Scarcity and Violent Conflict', 18.

[16] Hans Petter Toset Wollebæk, Nils Petter Gleditsch and Havard Hegre, 'Shared Rivers and Interstate Conflict', *Political Geography* 19 (2000), 971-96, at 993.

[17] Four of these skirmishes actually took place in the Middle East. Aaron T. Wolf, 'Conflict and Cooperation Along International Waterways', *Water Policy* 1 (1998), 251-65, at 255-56.

politicisation of the notion of security, as it explained armed conflicts not in terms of augmentation of political power through force, but as strivings for survival in view of declining vital resources. Jon Barnett answers very convincingly:

> If there is conflict over water, then that conflict is the result of a *failure of politics* to negotiate a settlement over the shared use of water. The idea that a war over water, or any other resource, is not a war about politics is dubious. Politicians and military leaders might wish to present war in Darwinian or Malthusian terms as a fight over subsistence needs, but this 'state of nature' rhetoric is a pragmatic device that denies responsibility for peaceful action, and justifies violence in lieu of meaningful dialogue.[18]

[18] Barnett, 'Destabilizing the Environment–Conflict Thesis', 276.

3

Challenging the water war hypothesis

It took ten years until a new stream of literature on the nexus between water scarcity and conflict came under way.[19] The argument stressing the conflict-laden qualities of water resources, which had been so dominant before, was challenged on various grounds. They can be categorised as follows:

- Questioning the supply side of the water wars argument;
- Questioning the demand side of the water wars argument;
- Suggestions about optimal pricing of water resources;
- Showing the cooperative potentials in managing water resources.

[19] The first article questioning the rationality of water wars appears to be Peter Beaumont, 'The Myth of Water Wars and the Future of Irrigated Agriculture in the Middle East', *International Journal of Water Resource Development* 10:1 (1994), 1-13.

A. Expanding water supply

I. Long-distance water transfers

In 1987, Turgut Özal, at the time Turkish Prime Minister, initiated a debate about the construction of a "Peace Pipeline" connecting the Ceyhan and Seyhan rivers (entering the Mediterranean near Adana) with a pipeline system to the Arab Middle East. One branch should have connected Turkey with Jordan, Palestine, and Syria, while the other was planned to bring fresh water to the Arab Peninsula. The total capacity of this water deviation was assumed to be around 6 billion m^3/year. The Turkish government presented this project as a transfer of needed resources parallel to the existing oil pipelines.[20] However, when estimates for the expected costs passed 1 USD/m^3 (the estimated maximum price in agriculture), it became obvious that this project was not a viable option for importing water for agricultural use. The debate about Turkish water exports focusing on other means of transportation (super tankers or vinyl – so-called "Medusa"-bags) to the Middle East continued for a while, but it resulted in only minor imports of Turkish water (50 million m^3/year of drinking water) to Israel.[21]

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[20] George E. Gruen, 'Turkey's Potential Contribution to Arab-Israel Peace', *Turkish Review of Middle East Studies* 8 (1993), 179-214.

[21] Paul Williams, 'Turkey's H_20 Diplomacy in the Middle East', *Security Dialogue* 32:1 (2001), 27-40, at 32.

II. Desalination

Another 'high-tech' option for increasing water supplies is desalination plants. It is very difficult to assess the feasibility of this option, as future production costs for desalinated water depend to a large extent on technological advancement.[22] Nowadays, the Gulf countries extensively use seawater desalination for supplying households, but the prices are still far too high for agricultural use. Assuming a considerable development of the technology causing a significant price drop, desalinated seawaters may contribute substantially to the overall water supply in the future. A much more viable option seems to be the desalination of brackish water through reverse osmosis. Installations of this kind can already be found in many Middle Eastern countries. Tony Allan assumes that by 2020, between 1 and 1.5 billion m^3/year of desalinated water will be produced in the Jordan Basin, increasing the currently available levels of freshwater by 50%.[23]

III. Groundwater

In many Middle Eastern countries, there are still unused groundwater aquifers: some of them are renewable, others are fossil resources. Obviously the use of

[22] One emerging technology in the field of desalination is so-called 'ultrafiltration', which could reduce costs considerably. See Stephan van Hoof and Abdul-Khaliq Hashim, 'The Effect of Ultrafiltration as Pretreatment to Reverse Osmosis in Wastewater Reuse and Seawater Desalination Applications', *Desalination* 124 (1999), 231-42.

[23] J. Anthony Allan, 'Hydro-Peace in the Middle East: Why No Water Wars? A Case Study of the Jordan River Basin', *SAIS Review* 22:2 (2002), 255-72, at 269.

fossil groundwater is problematic due to the absence of a sustainable use. Still, these waters could be strategically of great importance for a transitory period – either until the water demand of the agricultural sector declines, or until alternative sources (such as desalination) become economically feasible. One of the major problems with aquifers is that they do not respect national borders. The Mountain Aquifer crosses from Israel into the West Bank, the Dissi Aquifer crosses from Jordan to Saudi Arabia, and the Nubian Aquifer stretches over the territories of Egypt, Sudan and Libya. The exploitation of aquifers by one country can thus cause conflicts with its neighbours. Yet many countries in the Middle East need external funding for the exploration and exploitation of these aquifers. International funding agencies, like the World Bank, introduced a policy in the late 1950s that water projects would only be supported when consensus existed among all affected countries.[24] Cooperation is therefore needed to develop these resources and to expand the water supply.

IV. High dams

A similar argument can be made about the construction of dams. Dams can increase the supply of obtainable water, but they play an even more important role in the steadiness of water supply. In semi-arid climate zones like the Middle East, there are

[24] The World Bank's Operational Directive 7.50; see online under:
http://siteresources.worldbank.org/INTSAFEPOL/1142947-1116497123103/20507401/Chapter2GlobalAndCrossSectoralIssuesInEA.pdf

significant seasonal variations in precipitation; summer droughts and winter inundations are recurring phenomena. The investments in the agricultural and industrial use of water are calculated based on an average year, and important economic losses can thus occur in case of a drought or flood. High dams are an important tool to level out variations in water supply. In order to have such a beneficial effect, these dams do not necessarily have to be built on the national territory, but can belong to the infrastructure of neighbouring countries. This can be illustrated with a brief example: Turkey and Syria agreed in 1987 on a minimal downstream in the Euphrates River of 500m³/second. Before the construction of the Atatürk-Dam, the downstream could get as low as 250m³/s in an average summer. In the summer of 1991, the Euphrates had as little water as 199m³/s, but Turkey opened up the Atatürk-Dam in order to reach the guaranteed minimum of 500m³, and was thereby ready to bear costs of some 500 million USD due to losses in energy production.[25]

As Syria, Turkey and Iraq were unable to negotiate a common agreement, Turkey did not receive any financial support from international lenders to finance the Great Anatolian Project (GAP). When Turkey decided to build the GAP on its own, it resulted in a high inflationary pressure on the Turkish Lira and weighted out many of the economic advantages of the project. This example should not be understood as an attempt to downplay the strategic risks for Syria (and Iraq) involved in the con-

[25] Waltina Scheumann, 'Conflicts on the Euphrates: An Analysis of Water and Non-Water Issues', in Waltina Scheumann and Manuel Schiffler (eds.), *Water in the Middle East: Potential for Conflicts and Prospects for Cooperation* (Berlin: Springer, 1998), 113-36, at 129.

struction of the GAP in South-Eastern Turkey, but it shows what potential lies in infrastructure projects and cooperative agreements with regard to the steadiness and expansion of water supply in the region.[26]

V. Wastewater treatment

Another way to increase the water supply lies in the reuse of urban and industrial wastewaters. In this regard, there is still a lot to be done in the Middle East. In the Gaza Strip, one of the regions with the highest water stress in the whole Middle East, the wastewaters of only 20% of the inhabitants are treated. The huge majority of the wastewater is not only lost for reuse, but also contaminates aquifers and thereby reduces the quality of the water supply. Jeremy Berkoff assumes that "in the most water-short countries, it [treated wastewater] will ultimately become the predominant source of irrigation supply".[27] In order to reach such a massive increase in water supply through treated wastewaters, major

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[26] However, the above-mentioned example also points to a problematic aspect of such agreements. Most interstate water agreements in the Middle East allocate absolute quantities of water supply (the one exception being the Syrian-Iraqi agreement of 1990). This approach can lead to the situation that one single country has to bear most of the costs of a drought, and in case it is unable to do so (contrarily to the example described above), there is a real danger of conflict escalation among states sharing the same water resources. A percentage allocation of water in a common basin thus seems to be the much less conflict-laden solution (see section D below).

[27] Berkoff, *A Strategy for Managing Water in the Middle East and North Africa*, 49.

investments in the infrastructure are needed.[28] However, it may not suffice to only invest in infrastructure. Consumers in the Middle East have shown reluctance in buying goods produced with treated wastewaters.[29] Hence the confidence in treated wastewaters has to be improved not only by strict quality controls,[30] but also by public information measures.

Wastewater treatment might seem like a very local issue. Still, it can also become an issue of international conflict. If untreated wastewaters flow into a river or an internationally shared aquifer, the water supply of a neighbouring country can be heavily contaminated. Therefore, more international cooperation is also needed in the field of wastewater treatment. The Israeli-Jordanian "Integrated Program of Water Development" is the first attempt to address wastewater treatment as an issue of interstate cooperation.

VI. Reducing water losses

In Jordan, about 56% of water in urban delivery systems is not accounted for.[31] Syria suffers similar

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[28] V. Lazarova, G. Cirelli, P. Jeffrey, M. Salgot, N. Icekson and F. Brissaud, 'Enhancement of Integrated Water Management and Water Reuse in Europe and the Middle East', *Water Science & Technology* 42:1-2 (2000), 193-202.

[29] K.H. Mancy, B. Fattal and S. Kelada, 'Cultural Implications of Wastewater Reuse in Fish Farming in the Middle East', *Water Science & Technology* 42:1 (2000), 235-39.

[30] Saqer S. Al Salem, 'Environmental Considerations for Wastewater Reuse in Agriculture', *Water Science & Technology* 33:10-11 (1996), 343-53.

[31] Munther Haddadin, 'Water Management: A Jordanian Viewpoint', in J. Anthony Allan (ed.), *Water, Peace and the Middle*

losses, foremost in the Hama-Homs Channel. These losses are caused by leakages in the network, but also by illegal connections. Therefore, the maintenance and the control of existing delivery systems is an imperative.

Another problem that has to be tackled is evaporation. First, too much water evaporates on the fields; these losses could be diminished by techniques such as micro-irrigations, the water-saving potential of which is in the range of 30–50%.[32] Second, evaporation becomes an even bigger problem in artificial lakes such as Lake Nasser, where about 10 million m^3/year of water are lost due to evaporation. Therefore, the geographic position of high dams should be chosen with care in order to reduce evaporation to a minimum.

Water losses, however, do not only occur in the agricultural sector and in public infrastructure: the domestic and industrial use of water is also far from efficient. Households and industries should be invoked to save water through public awareness programs and higher water prices (see Section C below).

B. Water demand and water use in agriculture

Let us now look closer at the demand side of the water puzzle. The pessimistic branch of the literature has only looked at current water demand, and extrapolated future water demand based on these numbers (taking into account the important population growth). What these authors have ignored is the (in-)efficiency of the current allocation of water

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East. Negotiating Resources in the Jordan Basin (London: Tauris, 1996), 59-75, at 66.

[32] *Ibid*.

resources in the Middle East. In 1993, the MENA region as a whole allocated 87% of its water resources in the agricultural sector (69% of the global average), 7% for industrial (23%), and 6% for domestic use (8%).[33] How can this resource allocation be explained? For some (relatively) water-rich countries (such as Turkey and Iran; to a lesser extend Iraq) agriculture is a viable option for economic development due to relatively low labour costs and abundant arable land. These countries are even able to produce water-hungry bulk products, such as cotton, close to world market prices. But the reality for most Middle Eastern countries looks different: the agricultural sector is highly protected, not competitive compared to world market prices (at least not in bulk products), and receives its inputs (most importantly water, but also fertilisers) highly subsidised by the respective governments.

There are various reasons why such policies were introduced. First, most Middle Eastern countries still have a very weak industrial base, and the agricultural sector is thus an important employer in many Middle Eastern economies. By keeping the agricultural sector alive, the trend of urbanisation could be slowed down. However, an important decline of the share of the agricultural sector in the overall labour force can be observed in the majority of Middle Eastern countries over the past 20 years.[34] Second, many Middle Eastern countries were seeking self-sufficiency over the past three decades – not only in agricultural production, but also in applying

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[33] Berkoff, *A Strategy for Managing Water in the Middle East and North Africa*, 69.

[34] Jan Selby, 'The Geopolitics of Water in the Middle East: Fantasies and Realities', *Third World Quarterly* 26:2 (2005), 329-49, at 336.

import-substitution policies for industrial goods. These policies were justified in various ways: economically, they sought to improve their terms-of-trade (what did not materialise due to high input costs), and strategically, these countries tried to achieve independence in the supply of the most vital goods in view of the frequent armed conflicts in the region. Third, the agricultural sector represents an important lobby group, and some governments have their most important power base in the rural area (for example the reliance of the Jordanian King on the landowners and Bedouins, or the Syrian government on the Alawi). Thus, water allocation among sectors always had a political function in securing the existing regime.[35] Slightly different is the case of Israel, where the agricultural sector is more important as an ideological tool building one of the cornerstones of political Zionism.[36]

The political use of hydrological projects becomes even more obvious when they are aimed *against* the population inhabiting a certain area. When the Turkish government decided to realise the GAP, the political decision-makers did not only consider the increase in arable land, water and energy supply, but they also had in mind the increased control of a predominantly Kurdish populated area by settling people of Turkish origins and by improving the infrastructure.[37] Saddam Hussein, when deciding to dry the marshlands in the Shatt al-Arab, was not really concerned about the agricultural development

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[35] Rolf Schwarz, 'The Israeli-Jordanian Water Regime', *PSIS Occasional Paper* 1 (2004), 26.

[36] *Ibid*., 18 and Chapter 3.

[37] Robert Olson, 'Turkey Syria Relations since the Gulf War: Kurds and Water', *Journal of South Asian and Middle Eastern Studies* 21:1 (1995), 168-94.

in this region, but only cared about the control of the rebellious Shiite population.

These political considerations have led to serious inefficiencies in the use of water. This can be illustrated with the example of Saudi-Arabia: in the 1980s, the Saudi government tried to secure the support of the rural population in the Western part of the country by supplying farmers with fossil groundwater at practically no cost, while the costs of extraction were outrageously high. These farmers were using the subsidised water and other subsidised inputs (machinery, fertilisers) to produce wheat in quantities far above domestic demand. This was only possible because the Saudi government bought the wheat at a fixed price of 933 USD/ton (about eight times the world market price), and later 533 USD/ton. In 1993, the Saudi wheat output peaked at 4.5 million tons – about twice the domestic demand. As a result, Saudi Arabia became one of the major wheat exporters in the world.[38] One does not have to be an expert in agronomy to realise that such a use of expensive (and non-renewable) water resources is far from efficient considering the climate zone in which the wheat was produced. But making extrapolations from the current water use to determine future water demand, thereby ignoring these inefficiencies, shows a lack of insight or honesty (or both).

This was the point at which one of the major critics of the water wars assumption entered the debate. In various books and articles, Tony Allan introduced the concept of "virtual water".[39] Virtual

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[38] Elie Elhadj, 'Camels Don't Fly, Deserts Don't Bloom: An Assessment of Saudi Arabia's Experiment in Desert Agriculture', *SOAS Water Research Group Occasional Paper*, 48 (2003).

[39] J. Anthony Allan (ed.), *Water, Peace and the Middle East. Negotiating Resources in the Jordan Basin* (London: Tauris, 1996); Allan,

water is simply the amount of water needed in order to produce a good. This good is much more easily tradable than the amount of water needed for its production, as it has a high degree of concentration (see the discussion above about the feasibility of water imports), and world market prices for agricultural bulk products are well below the costs of domestic production.[40] Allan does not call for a complete abandonment of agriculture in the Middle East, but he advocates a reorientation on the comparative advantages of the region. The Middle East is not rich in arable land (featuring the necessary water supply), but rather in cheap labour. It is therefore much more efficient to produce predominantly labour-intensive agricultural products like fruit and vegetables, while importing water-intensive crops such as wheat. Allan estimates that until 2030, almost two-thirds of the water demand in the Middle East will be met by 'virtual' water, accounting for the equivalent of some 500 billion cubic metres of 'real' water per year.[41]

The liberalisation of agricultural products in the realm of the World Trade Organization (WTO) is both a chance and a danger in this regard; a chance in the sense that for Middle Eastern countries, opportunities in exporting vegetables and fruit will improve, but also a danger because the imports of virtual water will become more expensive once (export-)

'Hydro-Peace in the Middle East'; J. Anthony Allan and Mallat Chibli (eds.), *Water in the Middle East. Legal, Political and Commercial Implications* (London: Tauris, 1995).

[40] In Egypt, about 3,000 tons of water are needed to produce 1 ton of wheat. See Wollebæk, Gleditsch and Hegre, 'Shared Rivers and Interstate Conflict', at 976.

[41] J. Anthony Allan, 'The Political Economy of Water: Reasons for Optimism but Long Term Caution', in: J. Anthony Allan (ed.), *Water, Peace and the Middle East. Negotiating Resources in the Jordan Basin* (London: Tauris, 1996), 75-115, at 78.

subsidies in industrialised countries are abandoned. World market prices for wheat could rise even further when China (and potentially India) satisfies its rising demand on the world market.[42]

From a more general perspective, water use in the Middle East should be focused on economic activities with high returns. For some countries, the concentration on labour-intensive agricultural products might be a viable option. However, the return of one cubic metre of water in industry and in services is by and large much higher than even the most labour-intensive agricultural activity.[43] The often quoted water scarcity should therefore be seen as an incentive for a general reorientation of economic activities in the Middle East. Yet, the obstacles that have to be overcome in this process are manifold (capital accumulation, structure of the labour market, etc.) and beyond the scope of this paper.

C. Pricing water

How should this reallocation of water resources from low-return agricultural bulk products to high return (either agricultural or industrial) use work? The most evident instrument for such a resource reallocation is the price mechanism.[44] So far, water charges in the Middle East were mostly set at a price refinancing the overhead and management costs of water

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[42] *Ibid.*, at 99-103.

[43] D. Molden, F. Rijsberman, Y. Matsuno and U. A. Amarasinghe, 'Increasing Productivity of Water: A Requirement for Food and Environmental Security', *Global Dialogue on Water, Food an Environment Working Paper*, (2001), 8.

[44] Julian Simon, *The Ultimate Resource* (Princeton: Princeton University Press, 1981).

authorities, but included neither the infrastructural costs for delivery nor the costs for wastewater treatment. On average, water for irrigational use is charged only 0.02 USD/m³ in the Middle East, while the marginal costs are around 0.32 USD/m³; wastewater treatment costs range from 0.12 to 0.40 USD/m³ and have to be added to the marginal costs.[45] The difference between real costs and charged prices is only slightly lower for urban water uses. Differentials between marginal costs and charged prices are globally a common mechanism to subsidise agriculture (one of the strongest examples being the United States). Middle Eastern countries do not have to abstain entirely from this instrument, even more so as they have a strong interest in low food prices for the urban poor.[46] But the introduction of a gradual price system that is much closer to overall costs, or replacing water subsidies by direct payments (see section D. I. below) would give the right incentives not only for the readjustment of agricultural plantations, but also for a process leading to more industrial (high-return) use of water resources.

D. Cooperative solutions for water resources

Two different streams can be identified in the literature dealing with cooperative solutions of disputed waters: one showing *conceptually* the superiority of cooperative solutions over conflict, and the other demonstrating *empirically* the existence of stable cooperative solutions. The field of cooperative solutions, however, has a very wide continuum ranging

[45] Berkoff, *A Strategy for Managing Water in the Middle East and North Africa*, 35.
[46] *Ibid.*

from adherence to standards of international (water) law, over bi- or multilateral agreements dividing water resources to common water planning and water management. While there are many bilateral treaties dealing with water resources, the multilateral dimension or the common management of water resources is not (yet) a common pattern in the Middle East.

I. Incentives for cooperation

Franklin Fisher provided the most fundamental argument against the likeliness of water wars – at least in the Jordan Basin, which in the literature is always portrayed as the most likely scenario for an armed conflict. Calculations by the "Harvard Middle East Development Project" showed that the overall value of all the water resources in the basin was about 110 million USD/year in 1995, and could potentially rise to a maximum of 500 million USD in 2020 (in 1990 dollars).[47] Compared to the GDP of Israel, Jordan, and the West Bank, the value in 1995 was not higher than 4% for the West Bank and Gaza, 1.7% for Jordan, and 0.1% for Israel.[48] These numbers show that even if conflicts about the division of water resources occur, their escalation to all-out water wars is not likely due to the small values involved.

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[47] Franklin M. Fisher, 'The Economics of Water Dispute Resolution, Project Evaluation and Management: An Application to the Middle East', *International Journal of Water Resources Development* 11:4 (1995), 377-91.

[48] Calculation based on World Bank estimates for the GDP of the respective countries in 1995.

Many arguments of the discussion about the conceptual superiority of cooperative solutions can be found in the above sections. One example in this regard is the need for cooperation in the planning of costly infrastructure. As already discussed, many Middle Eastern countries rely heavily in the financing of major water projects on external funding, and in order to receive such funding, consensus of all affected states is needed. However, consensus is very difficult to reach in the absence of a formal agreement that regulates water uses and offers potential side payments to affected third parties.

Another beneficial aspect of formal agreements is the higher reliability of water planning. In the absence of a contractual solution, it becomes very difficult for national authorities and private investors to assess the availability of water coming from a neighbouring country. This problem already exists under normal circumstances, but it is strongly aggravated in arid years.

It would thus be an important step in the Middle East to conclude multilateral agreements including all the countries in a river basin. Such encompassing agreements are needed between Syria, Lebanon, Jordan, the Palestinian Authority and Israel in the case of the Jordan Basin,[49] between Turkey, Syria, and Iraq in the Euphrates Basin, and primarily between Uganda, Ethiopia, Sudan and Egypt in the Nile Basin.[50] The existing agreements in the Middle East are only of a bilateral nature, and thus exclude variations

[49] In 1955, the United States made an attempt to bring about such an integrated agreement with the so-called "Johnston Plan". Although the treaty was never ratified, most actors showed some adherence to it. See Schwarz, 'The Israeli-Jordanian Water Regime'.

[50] The same goes for internationally shared aquifers.

in water supply caused by the deviations made by third parties.

Multilateral agreements, however, should only be the first, though important, step. There is the danger that water agreements only *dividing* the water resources among the riparian states according to (percentage or absolute) quotas merely reflect the power distribution between the contractual partners. One classical example is the 1959 treaty between Egypt and Sudan over the waters of the Nile. Sudan accepted the much smaller share in exchange for diplomatic recognition by its powerful neighbour, who had previously questioned the claim for Sudanese independence repeatedly.[51]

The UN Convention on the Law of the Non-Navigational Uses of International Watercourses of 1997 tries to establish criteria for water allocation within a basin in order to avoid power-based division. It follows the logic of "limited territorial sovereignty", calling for an "equitable and reasonable utilisation and participation" (Article 5), while limiting the use with the "obligation not to cause significant harm" (Article 7) to others. Article 10 prescribes that no use of water should have inherent priority over other uses. Aaron Wolf shows very accurately how the attempt to reconcile the principles of hydrology and chronology resulted in a very vague definition of what 'equitable' means.[52]

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[51] Egypt follows a similar logic in regard to water rights of the upper Nile countries by insisting on the validity of the 1929 treaty concluded between Egypt and the United Kingdom (as the colonial power). This treaty strictly limits the water use in the Blue Nile region.

[52] Aaron T. Wolf, 'Criteria for Equitable Allocations: The Heart of International Water Conflict', *Natural Resources Forum* 23:1 (1999), 3-30.

Other mechanisms of water allocation must therefore be considered. The most important benefits materialise only on a higher level of cooperation: the *sharing* of water resources. With 'sharing' is here meant the shift away from national division to an allocation according to the most efficient use within a basin. Besides the efficiency of the water allocation, water sharing would allow for economies of scale in water management, and the bigger catchment basin could help to fight undersupplies in arid times. An important precondition for such a project is the physical interconnection between the various water delivery systems.

Aaron Wolf proposes two conditions under which an efficiency-oriented water allocation could work: a supra-national planning agency, and use of the price mechanism.[53] In view of the political tensions between Middle Eastern governments (foremost between Arab countries and Israel, but also among Arab countries) the establishment of a joint governmental planning agency may seem very difficult. However, the World Bank underlined the desirability of having operational activities in water management be assigned to special agencies independent from the policy level, and some Middle Eastern countries have implemented such reforms (Jordan, Morocco, and Yemen).[54] Therefore, the establishment of a joint independent planning agency may very well be a viable option.[55]

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[53] *Ibid.*

[54] In this regard, privatisation is portrayed as advantageous but not as imperative. Berkoff, *A Strategy for Managing Water in the Middle East and North Africa*, 44.

[55] Ulrich Küffer, 'Contested Waters: Dividing or Sharing?', in Waltina Scheumann and Manuel Schiffler (eds.), *Water in the Middle East. Potential for Conflict and Prospects for Cooperation* (Berlin: Springer, 1998), 71-87, at 80.

Such a planning agency should have the responsibility of price setting, and marginal costs pricing ought to be the guiding principle. Some authors call into question whether such a pricing model would not replace a lack of efficiency by a lack of fairness due to unequal economic abilities among water users in different countries and in different sectors.[56] But subsidised water prices are the wrong incentives in an arid climate zone; direct payments or tax rebates are much more efficient means.[57] Regional harmonisation of water prices can also be helpful in the political enforcement of higher water prices. National lobby groups will have a more difficult task to prevent marginal cost pricing if their competitors in neighbouring countries have to operate under the same conditions (see the section on water pricing above).

At first sight, such a solution might seem naïve and not very feasible in the Middle East, but it has to be underlined that the interim groundwater agreement between Israel and the Palestinian Authority of 1995 shows the strongest economic influence of *all* international water treaties: it has provisions for a future water market, and calls for an abolishment of all subsidies on marketed water.[58]

A further argument showing incentives for cooperative solutions in water disputes comes from the Neo-

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[56] Dombrowsky, 'The Jordan River Basin: Prospects for Cooperation within the Middle East Peace Process?'; Norman Frohlich and Joe Oppenheimer, 'Alienable Privatization Policies: The Choice between Inefficiency and Injustice', in Ariel Dinar and Edna Loehman (eds.), *Water Quantity/Quality Management and Conflict Resolution* (Westport: Praeger, 1994), 131-142.

[57] Küffer, 'Contested Waters: Dividing or Sharing?', 81.

[58] Wolf, 'Criteria for Equitable Allocations: The Heart of International Water Conflict'.

Functionalist school. Most interstate conflicts in the Middle East are multidimensional; water is but one of many issues about which tensions arose in the region. The theory of *political spillovers*[59] argues that if an institutionalisation of the conflict resolution in one issue area is achieved (and the incentives for doing so in the realm of water management are described above), other conflicts are more likely to be settled peacefully due to the reduction of overall tensions and the political capital invested by the conflicting parties. In the realm of water conflicts, there are no micro-level studies proving empirically the validity of the political spillovers argument, but various authors underline that the common management of water resources does have the potential for such a process to take place.[60] In South East Asia, Sadoff and Grey claim that the cooperation over the Mekong River was a stabilising factor in a region marked by violent ideological conflicts.[61]

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[59] David Mitrany, *A Functional Theory of Politics* (New York: St Martin's Press, 1975).

[60] Anders Jägerskog, *Why States Cooperate over Shared Water: The Water Negotiations in the Jordan River BasinWater and Environmental Studies*, PhD thesis (Linköping: Linköping University, 2003); Schwarz, 'The Israeli-Jordanian Water Regime'.

[61] Claudia W. Sadoff and David Grey, 'Beyond the River: The Benefits of Cooperation on International Rivers', *Water Policy* 4 (2002), 389-403, at 400. However, it has to be underlined that the waters of the Mekong River did not play an important role in these conflicts.

II. Empirical cases of cooperation over scare resources

Since ancient times, water has been an issue leading to conflict, but also to cooperation. The conflictual dimension is already obvious from the etymological link between the words 'rival' and 'river'.[62] In this section, however, the focus will be placed on the co-operative dimension of water. In (semi-)arid climate zones, water management has been a cornerstone in the development of a political society, with the society becoming 'political' in the sense that a group of individuals attempt to overcome a collective action problem. In the Nile Valley and in Iran, for example, costly infrastructure was needed to transfer the water to the arable fields. The costs to build such infrastructure were much too high for an individual, and therefore coordination within a group had to be achieved in order to bear the costs collectively. In the classical "hydrological societies" argument put forward by Karl Wittfogel, the monopolisation of this infrastructure enabled oriental leaders to establish a despotic rule with huge bureaucracies.[63] However, this shall not be the focal point of this analysis. It is more important to retain here that the scarcity of water resources, and the construction of infrastructure needed to overcome it, result in a collective action problem that has led to cooperation in the past. But we do not have to go back to the Middle East of the Bronze Age to encounter this phenome-

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[62] According to the Oxford Dictionary, the Latin meaning of '*rivalis*' is "one living on the opposite bank of a stream from another". In the English literature of the 16th century, the word 'rival' (or 'riual') is used in the sense of "one who is in the pursuit of the same object as another".

[63] Karl Wittfogel, *Oriental Despotism; a Comparative Study of Total Power* (New Haven: Yale University Press, 1957).

non; similar examples are found in the Swiss Alps. The farmers in the Valais started to construct so called *bisses* (channels for irrigation) in the 13th century to irrigate the meadows. The *bisses*, however, were not private property, but were constructed and managed by the whole local community or by the *consortages* (corporations of farmers).[64]

Let us now turn to more recent examples of cooperation in water matters. In 1960, India and Pakistan signed an agreement brokered by the World Bank on the division of the Indus Basin. The agreement foresaw that India should use the three eastern tributaries and Pakistan the three western tributaries to the Indus. The conflict had started when India stopped the flow of the Sutlej River into Western Punjab in 1948. The effects on the Pakistani (mostly Punjabi) agriculture were devastating. Undala Alam shows how all the conditions for a water war between India and Pakistan were in place at the time: water scarcity amidst a wider conflict and bellicose statements by key decision-makers.[65] Yet why was the Indus Waters Treaty nonetheless signed in 1960? The ostensible argument is that both countries applied for funding at the World Bank in order to develop their national water infrastructure. The World Bank refused to give any loans due to the conflict over the Sutlej River, and financing could only be secured through a cooperative agreement over the division of the Indus Basin. Indeed, both countries were rewarded with extensive financial resources

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[64] Didier Reynard, 'Histoire de l'eau. Bisses et irrigations en Valais au XV siècle', *Cahiers lausannois d'histoire médiévale* 30 (2002).

[65] Undala Z. Alam, 'Questioning the Water Wars Rationale: A Case Study of the Indus Waters Treaty', *The Geographical Journal* 168:4 (2002), 341-53, at 347.

after signing the treaty. Alam, however, claims that this was not the whole story, for why would they have negotiated for nine years if their only goal was to secure external funding? He answers this question by showing that it was rational to safeguard long-term water supplies for the development of both countries with a comprehensive agreement.[66] It must not go un-noted that India and Pakistan adhered to the Indus agreement ever since, even though extreme political tensions have been a recurring phenomenon, leading to two wars in 1965 and 1971.

Another, even more recent example are the water provisions in the Israeli-Jordanian peace treaty of 1994. The conflict in the Jordan Basin dates back to the Mandate period and was primarily fought over the allocation of water of the two major rivers: the Jordan and the Yarmuk.[67] The conflict heightened after the 1967 war, when Israel took exclusive control of the Jordan River by occupying the Golan Heights and deviating the Jordan waters from the Sea of Galilee through the National Water Carrier into the Negev. But Jordan also suffered losses on the Yarmuk River. First, important infrastructure such as the Mukheiba-Dam (under construction at the time) and the East Ghor Canal (in 1969) were destroyed by the Israeli army. The financing of their reconstruction, as well as the building of the projected Maqarin-Dam, were later blocked by an Israeli veto at the World Bank. Second, Israel intensified the utilisation of the Yarmuk River by pumping its water into the National Water Carrier. During the peace negotiations in the early 1990s, it was primarily the Jordanian side that pressured for an inclusion of the water

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[66] *Ibid.*

[67] This paragraph is primarily based on Schwarz, 'The Israeli-Jordanian Water Regime', 28-58.

issue in the agenda. After fierce resistance, this proposition was ultimately accepted by Israel, and Article 6 of the Peace Treaty exclusively deals with water issues (water allocations are specified in Annex II of the treaty).

Why did the two governments finally choose to settle their conflict over water with a cooperative agreement? The answer varies for the two parties involved. Israel did not have to give up any previous water use.[68] All the additional water that was allocated to Jordan is supposed to come from new sources. But Israel was able to safeguard contractually water resources that it acquired earlier only due to its military superiority. In addition to this, and unrelated to the water issue, the deal allowed Israel to conclude a bilateral peace treaty with one more Arab country, and was thereby able to split the Arab camp. This element clearly shows the potential of issue-linkage between water and other desirable outcomes. Jordan, on the other hand, was able to safeguard some additional 200 million m^3/year through the development of joint water projects (administered by a Joint Water Committee). Moreover, Jordan is finally able to realise the long-planned infrastructure projects on the Yarmuk (e.g. the Maqarin-Dam) that were blocked beforehand by Israel at the World Bank. But Jordan also had a strong political interest in reaching a peace agreement, as the country found itself in deep isolation after Jordanian support for (or rather lack of distance to) Saddam Hussein during the invasion of Kuwait. Furthermore, hopes were high that the signing of a peace agreement could lead

[68] Article I, paragraph 1 of Annex II only defines how much water Israel can pump from the Yarmuk River, while Jordan gets the rest of the flow. Thus, the treaty is in favour of Israel in arid years and in favour of Jordan in wet years.

to substantial external revenues as a 'peace dividend'. The peace treaty, and the water regulations included in it, are probably still too recent to come up with an assessment of their solidity. However, it must be underlined that the tensions over water that arose after the signing of the treaty were all settled in a peaceful, cooperative manner.[69]

The Israeli-Jordanian accord has one significant element that we have to retain: through the establishment of a cooperative solution, the total amounts of water supply increased. Thus, the interaction between the two countries was changed from a (realist) zero-sum to a (liberal) positive-sum game.

Only eleven months later, on 28 September 1995, Israel and the Palestine Liberation Organisation (PLO) signed the "Interim Agreement on the West Bank and the Gaza Strip" (also called Oslo II). Annex III of the agreed treaty covers, among other issues, the interim solution of the water conflict between the two parties. The disputed water resources are to be found primarily in the Mountainous Aquifer. Since the occupation of the West Bank in 1967, Israel strongly limited the Palestinians' access to these groundwater resources. In the Interim Agreement of 1995, Israel and the PLO agreed that the Palestinian population should receive an additional portion of 28.6 million m^3/year of the disputed waters during the interim period. Still, Israel only made the commitment to deliver an additional 9 million m^3/year to the Palestinian cities, while most of the additional water was to be developed by the Palestinian Authority (PA), and it was not specified from which sources this increase in water supply

[69] Munther Haddadin, *Diplomacy on the Jordan: International Conflict and Negotiated Resolution* (Dordrecht: Kluwer Academic Publishers, 2002), 418-26.

should come. There remain many unanswered questions in the treaty and the water allocation is far from equitable (see the discussion in Section 3. A. above), but the treaty should be perceived as what it is: an interim agreement. Compared to the previous situation of unilateral occupation, the agreement was an important turning point towards a contractual solution between partners having an equal right of existence and self-determination that explicitly included the access to water.

Then again, the Israeli-Jordanian and the Israeli-Palestinian agreements point to a very important problem: what happens when Syria and Lebanon want to participate in a comprehensive agreement? All the nice numbers showing an increase of Jordanian water supply could suddenly fade away. Therefore, every country within a basin should be included in the formulation of a cooperative solution. But this lack of comprehensiveness in the attempts to solve water conflicts does not only exist in the Jordan Basin. The same can be said about the Euphrates-Tigris Basin or the Nile Basin. In the latter case, there is at least some hope: during the 2005 summit of the Organisation for African Unity (OAU), the Egyptian, Sudanese and Ethiopian presidents met in order negotiate over the development of water use in the Nile Basin.[70] Although tripartite talks are a good starting point, it must nonetheless be remembered that more countries are part of the Nile Basin: Burundi, the Democratic Republic of Congo, Eritrea, Kenya, Rwanda, Tanzania and Uganda.

[70] 'Künftig weniger Streit ums Wasser des Nils?', *Neue Zürcher Zeitung*, 23/24 April 2005, 9.

E. The state-of-the-art

If we only look at the academic discourse about the probability of water wars in the last ten years, the result is straightforward: 'true' water wars are very unlikely events. Here we follow the classification of Anthony Turton, who only labels wars that are fought over the direct access to water as "true water wars". Water scarcity is a necessary and a sufficient condition for such wars to occur. However, it is probable that in conventional wars, water infrastructure is attacked out of strategic reasons, or that conventional wars are fought in and around waterways due to contested boundaries. In such conventional wars, it may happen that water is politicised by the belligerents, but water scarcity is neither a necessary nor a sufficient condition for such wars to occur.[71] This clarification is particularly important for the Middle East, where we encounter multi-dimensional conflicts that escalated in the 20th century into recurring wars. The water wars literature very often ignores the many facets of the conflicts, and already sees in the (executed or threatened) destruction of water infrastructure a smoking gun proving its assertions.

Although the above sections tried to show the cooperative potentials arising from the scarcity of water, we do not have to expect cooperative solutions in each and every instance. Interstate tensions because of contested water resources are very likely to occur again, and it is even possible that in future

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[71] Anthony Turton, 'Water Wars in Southern Africa: Challenging Conventional Wisdom', in Hussein Solomon and Anthony Turton (eds.), *Water Wars: Enduring Myth or Impending Reality?* (Umhlanga Rocks: African Centre for the Constructive Resolution of Disputes (ACCORD), 2000), 35-63, at 36.

armed conflicts, water will become a highly politicised issue. But water will not be the sufficient condition for them to take place. One of the strongest arguments in this context comes from the "Harvard Middle East Development Project", which shows the very limited economic value involved in the contested waters (see Section 3 D. I. above). Furthermore, it needs to be underlined that *conflict* over resources is not the problem. Disagreement and struggle over resource allocation is an existential condition of human society. It is much more a matter of whether these conflicts can be solved peacefully and whether cooperative solutions can be found – but this is a *political* problem, and nothing else.[72]

Generally speaking, we are more likely to see cooperation over scarce water than interstate armed conflict. If the cooperation is firmly institutionalised, we may even observe a decrease of the overall tensions due to *political spillovers*.

[72] Barnett, 'Destabilizing the Environment–Conflict Thesis', 286.

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Rethinking the nexus between water scarcity and armed conflicts

It would be reasonable to ask why we should even bother about the nexus between water scarcity and armed conflict if the water war hypothesis has been disproved scientifically, and if we can see a rising number of agreements dealing with interstate water disputes. There are different ways to answer this question, and this section will try to explain why a simple epistemic consensus may not suffice to render the water wars hypothesis irrelevant altogether.

First, the agreements that have been signed are not necessarily as cooperative as they might seem. Second, even if interstate wars over water resources are very unlikely events, there is still the possibility that armed conflicts occur on a sub-national level. Third, *epistemic communities* were not very important for reaching the agreements between Israel and Palestine. Peter Haas argued that the existence of an epistemic consensus in a specific policy field would ultimately push political actors to cooperation.[73] Anders Jägerskog, however, showed that experts

[73] Peter M. Haas, 'Introduction: Epistemic Communities and International Policy Coordinaton', *International Organization* 46:1 (1992), 1-35.

played only a limited role on the Israeli side, and an even smaller role in the Jordanian and Palestinian negotiating teams. Furthermore, Jägerskog underlines the fact that politicians only used and listened to expertise that suited their political goals.[74] The perception of political actors was much more influenced by a *sanctioned discourse*.

A. Water agreements as hegemonic projects

If we take a closer look at the water agreements signed between Israel and Jordan, and Israel and the PLO respectively, we will find certain common patterns. First, these agreements were not exclusively focusing on water issues, but were in one case a peace treaty and in the other case an interim agreement in which mutual recognition was inherent. Water is only one of several issues the agreements are concerned with.[75] Therefore, a dynamic process of issue linkages and concessions took place before reaching the agreement. Both Jordanians and Palestinians made important concessions in their water demands due to other, more important goals they were able to attain in the agreements. The Jordanian government accepted that its additional share of water was to come almost exclusively from water

[74] Jägerskog, *Why States Cooperate over Shared Water: The Water Negotiations in the Jordan River Basin*, 122-34.

[75] In the Israeli-Jordanian Peace Treaty, the issues were peace, security, boundary conflicts and water; in the Israeli-Palestinian Interim Agreement they were Jerusalem, settlements, boundary conflicts, refugees and water. It is worth mentioning that water was not even on the initial agenda for bilateral negotiations between Israel and Jordan. See Schwarz, 'The Israeli-Jordanian Water Regime', 76-77; and Haddadin, *Diplomacy on the Jordan*, 486-498 .

sources that still need to be developed, and that Jordan bears the costs of droughts. The primary goal of the Jordanian elite in the peace treaty was thus not related to water, but rather to the expected massive inflow of financial resources in the form of a *peace dividend*.[76] The PLO, in turn, also accepted a very unfavourable agreement, allocating about 85% of the three aquifers on the West Bank to the Israelis, while the Palestinians only received the remaining 15%.[77] At the same time, however, the interim agreement as such was a political recognition of the right for a Palestinian state, and of the PLO as the organisation representing the Palestinians' interests (thereby reaffirming Oslo I). Furthermore, the PA was given formal authority over most Palestinian cities in the occupied territories with the exception of East-Jerusalem and parts of Hebron. These issues seem to have been more important to the PLO than an equitable water agreement. The Israeli side, however, made only very limited concessions in regard to water allocation (at least not in the short run), but rather secured water resources contractually that it controlled before only due to its military superiority.

A second issue of importance is the strictly bilateral nature of the signed agreements. There is no linkage between the Israeli-Jordanian and the Israeli-Palestinian agreements. Furthermore, Syria, an important riparian of the Jordan Basin, was completely excluded from the negotiations. Israel was therefore

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[76] See above and footnote 70.

[77] Julie Trottier, 'Water Wars: The Rise of a Hegemonic Concept. Exploring the Making of the Water War and Water Peace Belief within the Israeli–Palestinian Conflict', *From Potential Conflict to Cooperation Potential (PCCP): Water for Peace. UNESCO-Green Cross*, (2002), 12.

able to control the negotiating process without having to fear a strong coalition of Arab actors.

One may thus perceive the water regime put in place by the two agreements as mainly a hegemonic solution favoured by Israel. It is hence possible to apply the so-called "hegemonic stability theory", which argues that a regime is created by a hegemon having a very strong interest in the regime's existence. The hegemon establishes the rules of the regime and enforces them thereafter.[78] This view is consistent with Miriam Lowi's argument in a publication studying the power differentials in water basins:

> [I]nsofar as international river basins are concerned, we find cooperative arrangements *only* where threats to national security, in the form of resource need, exists and where such arrangements have been advocated by a hegemonic power.[79]

Shlomi Dinar supports this view as one of several approaches to understanding the cooperative solutions between Israel and the PA.[80]

Hegemonic solutions imposing unfavourable conditions on others are only as stable as the hegemon itself. Palestinian professionals have already voiced the criticism that the Joint Water Committee was subject to the Israeli army's understanding of security.[81] There thus exists the potential threat that

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[78] On "hegemonic stability theory" see Charles P. Kindleberger, 'Dominance and Leadership in the International Economy. Exploitation, Public Goods, and Free Rides', *International Studies Quarterly* 25:2 (1981), 242-54.

[79] Miriam R. Lowi, *Water and Power. The Politics of a Scarce Resource in the Jordan River Basin* (Cambridge: Cambridge University Press, 1993), 10, emphasis in the original.

[80] Shlomi Dinar, 'Water, Security, Conflict and Cooperation', *SAIS Review* 22:2 (2002), 229-53, at 243.

[81] Allan, 'Hydro-Peace in the Middle East', 268.

if the water regime does not serve the interests of the weaker parties (e.g. the development of additional water sources is not realised or is delayed), and if the relative power of the hegemon declines, counter-hegemonic forces could bring the regime to collapse and overall tensions in the region could rise again.

There are various grounds on which this hypothesis can be criticised. First, in its original field – International Political Economy – it was asked why the hegemon should press ahead with free trade and not prefer a policy of optimal tariff setting.[82] In analogy, one could ask in the case of the water regime why Israel does not continue with its high utilisation of water while threatening every neighbour who tries to develop its infrastructure on disputed water. Second, one can question Israel's hegemonic position in the bargaining process. While Israel is clearly the hegemon on the regional level, the United States, *the* global hegemon, was heavily involved in the negotiating process. Obviously there were common interests between the US and Israel in the Middle East peace process, but it is a simplistic view to assume that their relative positions were congruent. Third, as shown above, it was Jordan that pressed hard for an inclusion of the water issue in the negotiations. Hence it would be quite wrong to assume that Israel followed a strategy of imposing a hegemonic water regime from the very beginning. Last but not least, it could be argued that even if the water regime was perceived as unfair and hegemonic, and does finally

[82] John Conybeare, 'Public Goods, Prisoners' Dilemma and the International Political Economy', *International Studies Quarterly* 28:1 (1984), 5-22.

collapse, the overall value of the disputed water resources would still be too small to justify a war.[83]

B. No water wars, but water riots?

Not only did Aaron Wolf show in his above-cited empirical study of 1998 that there were no interstate water wars in modern history, but he also underlined that the nexus of violent conflict and water existed – only that the scenario of those conflicts was the domestic level. With regard to water conflicts, Wolf writes, "geographic scale and intensity of conflict are inversely related".[84] He confirmed these findings in a follow-up study in 2003 (carried out together with Yoffe and Giordano):

> If there is to be water related violence in the future, it is much more liable to be like the "water riots" against a Bechtel development in Bolivia in 1999 than "water wars" across national boundaries.[85]

In December 2003, the Danish Institute for International Studies in Copenhagen organised a conference that addressed the issue of domestic "water riots". The findings of the conference were the following:

> There seems to be evidence that the sharing of transboundary water resources between

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[83] See Fisher, 'The Economics of Water Dispute Resolution, Project Evaluation and Management: An Application to the Middle East'.

[84] Wolf, 'Conflict and Cooperation Along International Waterways', 255.

[85] Aaron T. Wolf, Shira B. Yoffe and Mark Giordano, 'International Waters: Identifying Basins at Risk', *Water Policy* 5 (2003), 29-60, at 50.

> two or more nations tends to give rise to collaboration between governments on developing the shared water resource rather than conflict. However, there is a risk that the interests and concerns of less powerful and influential constituencies, such as the poor, as well as environmental concerns are left out of such collaborative efforts.[86]

The problem identified by the group of experts participating in the conference was that water management is primarily made on a national level, and is therefore not appropriate for the needs of local stakeholders. The participation of the civil society in the planning of water projects was so far very limited. The ignorance towards local needs leads to poor governance of water resources, which can result in local undersupplies and rising *local* conflicts over scarce waters. The privatisation of water utilities is identified as one further source of potential conflict, as it may preclude the access to freshwater for the poorest. While international donors condition their financial help on international cooperation, the same institutions did not pay enough attention to potential local conflicts.

Jan Selby argues that water does not play an important role in the Middle East's political economy at all. He therefore refutes both, the water wars and the water peace literature.[87] Furthermore, he claims that oil was still the single most conflict-laden

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[86] Jannik Boesen and Helle Munk Ravnborg (eds.), *From Water 'Wars' to Water 'Riots'? – Lessons from Transboundary Water Managment; Proceedings of the International Conference, December 2003, DIIS, Copenhagen* (Copenhagen: Danish Institute for International Studies, 2004), 158.

[87] Selby, 'The Geopolitics of Water in the Middle East: Fantasies and Realities', at 338-49.

resource in the Middle East.[88] On the local level, however, he affirms the conflict potential arising from scarce water resources. By using anecdotal evidence – such as an armed conflict between two villages over a local spring near Ta'iz, in Yemen, which claimed six lives[89] – he tries to show how a very uneven allocation of water led to clashes on the local level. Selby can be criticised for his complete ignorance towards the national or 'sanctioned' discourse that arguably conditions water allocation in the Middle East (see Section 4. C below).

A lot more needs to be done in the water riots literature. So far, the field is largely under-theorised, and mostly operates with anecdotal cases without trying to formulate testable hypotheses or showing necessary and sufficient conditions for water riots to occur. Another element that is missing is the backward loop to the international level: increased instabilities on the domestic level could also transform into more (and more violent) interstate conflicts. Obviously such conflicts could not be categorised under the catchy title of water wars, as water scarcity would be only at the heart of the domestic conflict. Still, it must be underlined that most of the literature dealing with water allocation and domestic conflict was developed in response to the water war hypothesis. Therefore, the latter must be attributed some credit for focusing scientific awareness on the 'real' problem. Yet one could also frame it in the opposite way: the fixation on the nexus between water scarcity and interstate conflict has distracted policymakers

[88] *Ibid.*, 341.
[89] *Ibid.*, at 344.

and scientists from the 'real' problem, and has led to ill-suited water management on the local level.[90]

C. The 'sanctioned discourse' of self-sufficiency

Both the water war and the water peace literature can be criticised for using a simplistic, anthropomorphic representation of the state.[91] The state is portrayed as a unitary actor trying to secure desperately needed water resources. Not enough attention is paid to the discourses about water and the various coalitions promoting them.

The 'sanctioned discourse' is "the prevailing dominant opinion and views, which have been legitimised by the discursive and political elite".[92] The essence of this discourse on water is that "Middle Eastern economies only need a little more water to be 'secure'."[93] 'Secure' in this context means to reach self-sufficiency in the supply of water and foodstuff. Most Middle Eastern countries have used imports of 'virtual water' in order to reduce the domestic demand for real water.[94] But Tony Allan argues that they tried to hide these imports in order to maintain the public discourse on water security and self-

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[90] Boesen and Ravnborg (eds.), *From Water 'Wars' to Water 'Riots'?*, 154.

[91] Trottier, 'Water Wars: The Rise of a Hegemonic Concept', 12.

[92] Anders Jägerskog, 'The Sanctioned Discourse – a Crucial Factor for Understanding Water Policy in the Jordan River Basin', *Department of Water and Environmental Studies Occasional Paper*, 41 (2002), 1.

[93] Allan, 'Hydro-Peace in the Middle East', 258.

[94] Israel, Palestine and Jordan import more than 5 million tons of grain, while all the freshwater in the three territories could have only produced 3 million tons. *Ibid.*, 266.

sufficiency in food production, instead of starting to implement the necessary reforms in the domestic water allocation. He therefore concludes that

> the first decades of the twenty-first century will be subject to the same ideas as those that shaped water policy and negotiating positions in the previous half-century. Politics will also continue to dominate the water sectors of individual political economies as well as waters that are shared internationally.[95]

Anders Jägerskog tries to refine the argument by stressing national differences of the sanctioned discourse in Israel and Palestine, and how these came about. In Israel, "water development" played a crucial role from the early Zionist times.[96] It was an ideological tool in different ways: on the one hand, the "greening of the desert" was a very powerful legitimising discourse for the existence of the Jewish State in Western societies. On the other hand, the "New Jew" was supposed to plant his clod as a transformative process from the Diaspora Jew to the "homo israelianus".[97] Agricultural settlements were perceived as strategically important to defend the country. The linking of agricultural activities with strategic considerations prevails until present time in the Israeli discourse.[98] As already mentioned earlier,

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[95] *Ibid.*, 270.

[96] Trottier, 'Water Wars: The Rise of a Hegemonic Concept', 3.

[97] Yoav Gelber, 'The Shaping of the "New Jew" in Eretz Israel', in Israel Gutman (ed.), *Major Changes within the Jewish People in the Wake of the Holocaust* (Jerusalem: Yad Vashem, 1996), 443-61.

[98] See for example statements by the former Israeli water commissioner Meir Ben-Meir, quoted in Jägerskog, 'The Sanctioned Discourse'. The former Minister of Agriculture Raphael Eitan made similar statements in a media campaign published in *The Jerusalem Post*.

the military sector embraced the environmental security discourse as it broadened their field of competence and presented armed conflict as an existential fight for subsistence needs. Therefore, the military and the agricultural sector formed a strong discourse coalition favouring the currently high allocations of water resources over any kind of concessions to the Palestinian side.[99] This coalition established something that might be called "water nationalism" in which the 'Other' (i.e. Palestinians, Jordanians and Syrians) was primarily a danger to one's own hydrologic mission.[100]

On the Palestinian side, water became an important issue during the process of political mobilisation in the 1980s. The establishment of universities in the occupied territories in the 1970s led to the formation of a new elite that gradually replaced the landowning notables. The new elite embarked on a strong nationalistic discourse in which the appropriation of 'national' resources, most importantly water, played a crucial role.[101] When the PLO leadership came back from its exile in Tunis and took over leadership in the PA, it adopted the nationalistic approach to water resources in order to obtain legitimacy from the Palestinian population. Primacy was given to the achievement of water rights, while the norm of 'equitable use' seemed far less attractive. A second pattern

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[99] *Ibid.*, 3.

[100] On water nationalism see Jeremy Allouche, *Water Nationalism: An Explanation of the Past and Present Conflicts in Central Asia, the Middle East and the Indian Sub-Continent* (Geneva: University of Geneva, IUHEI, 2005).

[101] Marwan Haddad, 'The Dilemma over Palestinian Water Rights', in: Eran Feitelson and Marwan Haddad (eds.), *Joint Management of Shared Aquifer – the Fourth Workshop* (Tel Aviv: The Harry S. Truman Institute for the Advancement of Peace, 1997).

in the Palestinian sanctioned discourse was to put all the blame for inefficiencies in the occupied territories on the Israelis, thereby blocking any reallocation of water resources.[102]

More generally speaking, the political allocation discussed in Section 3. B. proved to be a great liability in any attempt of reallocating water resources. Politically important groups, such as landowners, were given strong incentives in the past to invest in the expansion of agricultural production through artificially low water prices. Even when the relative importance of the agricultural sector decreased over time, these coalitions were still able to maintain a strong influence on public policy through their organisational and personal affiliations in the policy network.[103] These groups can always invoke the well-established national discourse of Zionism or 'food security' in order to bolster public support for their demands. Private households and the industrial sector, supposedly the main beneficiaries of water reallocations, oppose a reform of water policy due to their fear of higher water prices. Potential tax reductions due to an abolishment of subsidised water in agriculture are less imminent and foreseeable than the increase of urban water prices. Urban stakeholders thereby reinforce the power position of agricultural blocking coalitions.

The sanctioned discourse and the powerful coalitions defending this discourse do not necessarily render international cooperation impossible, but they set the boundaries of what might be politically feasi-

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[102] Trottier, 'Water Wars: The Rise of a Hegemonic Concept', 11.

[103] Gila Menahem, 'Policy Paradigms, Policy Networks and Water Policy in Israel', *Journal of Public Policy*, 18:3 (1998), 283-310.

ble and of what can be negotiated.[104] Yet, if coalitions in different countries are lobbying for very extreme positions, and if they are able to have a strong influence on national constituencies, it is possible that no agreement can be reached due to the lack of domestic ratification.

An even stronger argument in a similar line of thinking is made by Julie Trottier. Applying Gramsci, she argues that the water war hypothesis has become a "hegemonic concept" that is now under increasing pressure from the competing water peace hypothesis. While the existing hegemonic concept is defended by a powerful national coalition of military, agribusiness, hydro-industry, and the media, the challengers come mainly from international organisations and other actors having a strong interest in the stability of the region (such as the European Union).[105] It should not go unnoticed that Trottier made this argument in a paper published by a joint program of UNESCO and the Green Cross, called "From Potential Conflict to Cooperation Potential (PCCP) Water for Peace", which is very much involved in propagating the water peace thesis.

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[104] Using the terminology of a two-level game, it can be argued that domestic coalitions favouring current water allocations reduce the win-sets of national authorities in international negotiations. 'Win-sets' describe a set of potential agreements that will receive ratification by the national constituencies (either through parliamentary ratification or through re-election of the current executive). On two-level games see Robert Putnam, 'Diplomacy and Domestic Politics: The Logic of Two Level Games', *International Organization*, 42:3 (1998), 427-460, and for the application of the theory on water negotiations see Alan Richards and N. Singh 'Two level negotiations in bargaining over water', *Dept. of Economics Working Paper*, (Santa Cruz: University of California, 1996).

[105] Trottier, 'Water Wars: The Rise of a Hegemonic Concept', 11-13.

Both approaches, the 'sanctioned discourse' and the 'hegemonic concept', suffer a similar weakness: they both cannot explain how and why changes occur. Allan, for example, argues that Jordan changed its water allocation policy in recent years, but he neither explains why these changes occurred, nor what their influence on the sanctioned discourse was.[106] The problem inherent in the hegemonic concept applied by Trottier is even greater, as she cannot explain (and she does not even try to do so) why agreements on water have been signed in the Jordan Basin. However, both concepts show that the conflict-laden perspective on national sovereignty and self-sufficiency in water continues to play an important role in the political discourse and in the perception of political actors. The water wars thesis, therefore, cannot be put aside just because of a scientific consensus favouring cooperative solutions, or as Jon Barnett put it, "as much as politicians identify water as a cause of violence, the prospect of water wars should be taken seriously".[107]

[106] Allan, 'Hydro-Peace in the Middle East', 260.

[107] Barnett, 'Destabilizing the Environment–Conflict Thesis', 276.

5

Conclusion

This Occasional Paper attempted to outline the development of the water wars debate over the past twenty years. After discussing the origins and the line of reasoning in the literature portraying scarce water resources as a primary source of interstate armed conflicts, we turned to those challenging this view by describing scarce water resources as being as much a source of cooperation as one of conflict. The likeliness of armed interstate conflicts over water resources is very limited due to the low economic value involved, and we can therefore say that there is an epistemic consensus running against the predictions of water wars.

However, as we tried to show in Chapter 4, there are various reasons why we should still care about the nexus between scarce water resources and armed conflict. First, the epistemic consensus favouring the water peace hypothesis does not (yet) have a very strong influence on the belief systems of political decision-makers. Second, the liberal (functionalist) argument that spillover effects from cooperation over scarce water to other issue areas can be expected, might be convincing in theory, but needs to be underpinned by many more empirical studies. Third, the water peace literature could be flawed if

indeed recent cases of cooperation did not follow a liberal line of thinking, but were rather hegemonic solutions enforced by the most powerful riparian to a river basin. Fourth, violent water conflicts that are likely to occur will take place on the national, but not on the international level. Fifth, while cooperative solutions were found on the international level, the adherence to a sanctioned discourse of water development and water self-sufficiency hindered the process of water reallocation among sectors on the domestic level.

These arguments showing the enduring relevance of the link between scarce water resources and violent conflict might seem very disparate. But the last two aspects, the adherence to a sanctioned discourse and the danger of water riots, can be related to each other. As described above, the sanctioned discourse about self-sufficiency is defended by powerful coalitions that enjoy a very favourable access to political decision-makers. Moreover, the allocation of water resources following the sanctioned discourse is far from efficient. The power held by those coalitions only partly explains why political decision-makers give in to their demands. The tendency to maintain a discourse of self-sufficiency makes much more sense once the danger of water riots is added to the cost-benefit calculation. Important groups in all Middle Eastern countries have invested both real and political capital in the present allocation of water resources. Any major change to the patterns of water allocation could increase the likeliness of domestic water riots. As Tony Allan writes:

> To discuss them [patterns of water allocation] publicly would contradict deeply held beliefs regarding water security (as well as each country's independent national water poli-

> cies), which would be politically destabilizing to say the least.[108]

Therefore, both the adherence to the sanctioned discourse about water allocation and the maintenance of water wars as a hegemonic concept serve the interests of political elites, in so far as they allow attention to be diverted from the distributive conflicts over water resources on the domestic level. What we observe in the political discourse is primarily an exteriorisation of domestic problems on the international level. Even if the rationality of water wars remains questionable in view of the economic values of the disputed water resources, these discursive practices can still have a very detrimental effect on the overall level of tensions. Furthermore, the current water allocation is not sustainable. If virtual water is only imported to maintain the traditional patterns of water allocation, as Allan claims (see Section 5. C. above), and if the populations keep growing, we will observe drops in the per capita availability of water resources, in some cases (like Palestine) even below the needs of households. However, this 'absolute' scarcity of water would not be caused by climatic conditions or population growth, but would be primarily man-made.

There is a further lesson we need to learn from the 'water wars vs. water peace' debate. The effect of the epistemic community on political decision-makers was ambiguous, to say the least. In the early 1990s, an epistemic consensus seemed to exist that water wars will be the coming conflicts (not only, but primarily) in the Middle East. This 'early' consensus was adopted by political decision-makers out of various reasons that were discussed in this paper. At the

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[108] Allan, 'Hydro-Peace in the Middle East', 258.

turn of the millennium, a new epistemic consensus was established, highlighting the cooperative potentials in dealing with scarce water resources, while the crude water war hypothesis was refuted. The highly interdisciplinary character of the issue played an important role in this delay of ten years. Furthermore, it needed some time until the well-funded research programs initiated in the early 1990s led to strong results. Still, as discussed above, the 'new' epistemic consensus received far less attention by politicians and the public than the apocalyptical visions of water wars. Most striking is the absence of the more recent approaches to water conflicts in the media. There are different reasons for this phenomenon: first, the water peace hypothesis is far more complex than the water wars hypothesis. It is, for example much more difficult to explain the concept of 'virtual water' to a wider public than to follow a crude Malthusian logic of scarce resources and population growth. Second, 'water peace' is a less catchy title than 'water wars' and does not help to increase a newspaper's circulation. Finally, it should not go unnoticed that journalists participated heavily in the establishment of the water wars discourse (Cooley, Bulloch, Darwish, and many others). In the water peace literature, there were hardly any journalistic contributions so far.

The authors favouring the water peace approach were very successful in scientifically refuting the water wars hypothesis, but their success is confined to the academic discourse. They did not make enough efforts in finding feasible multipliers (like the media) that could spread the 'good news' to a wider audience. Furthermore, not enough attention was paid in involving groups that should have a strong interest in the reallocation of water resources such as

households and industries. In order to challenge the 'hegemonic concept' of water wars, the inclusion of a wider public and interested groups is absolutely essential. Of course, one could argue that such a missionary endeavour bears the danger of over-politicising scientific debates. But the debate over water scarcity and conflicts has passed this stage a long time ago. It is thus desirable that the public and political decision-makers are much more exposed to the scientific debate showing the cooperative potentials in dealing with water scarcity.

5

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3

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