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## Disputes Over Water Resources: A History of Conflict and Cooperation in Drainage Basins

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## Disputes Over Water Resources: A History of Conflict and Cooperation in Drainage Basins

### Abstract

This paper presents the analysis of conflict history over freshwater in several drainage basins across the planet. As will be demonstrated in this paper, unilateral water policies have proved to reduce the role and prospect of water treaties and international water sharing regimes, and led to political tensions and conflicts. The main argument of the essay is that unilateral diversions of water flows will instigate wars between riparian states because of the rising demand for freshwater in the future. Unilateral practices of water diversion create a situation of inequitable distribution of water among nation-states within a basin which is a prerequisite for a sustainable conflict. State policies have to aim to eliminate situations of inequitable distribution and increase accessibility to clean drinking water for populations across a river basin based on their needs in order to secure long-lasting peace and stability.

**Keywords:** *conflict and cooperation, drainage basins, freshwater, globalization, Middle East, riparian states, South Asia, water resources*

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A History of Conflict and Cooperation in Drainage Basins**

**Shavkat Kasymov**

**Abstract**

*This paper presents the analysis of conflict history over freshwater in several drainage basins across the planet. As will be demonstrated in this paper, unilateral water policies have proved to reduce the role and prospect of water treaties and international water sharing regimes, and led to political tensions and conflicts. The main argument of the essay is that unilateral diversions of water flows will instigate wars between riparian states because of the rising demand for freshwater in the future. Unilateral practices of water diversion create a situation of inequitable distribution of water among nation-states within a basin which is a prerequisite for a sustainable conflict. State policies have to aim to eliminate situations of inequitable distribution and increase accessibility to clean drinking water for populations across a river basin based on their needs in order to secure long-lasting peace and stability.*

**Introduction**

The struggle for resources, whether material or symbolic, has always played a pivotal role in the formation and shaping of societies and polities. Over time, with the increase in world population and the number of nation-states, the intensity and quantity of conflicts for natural resources has risen at an alarming rate. Conflicts over resources are commonplace today as was the case for centuries earlier. How different is water and

rivers in particular from other types of resources? Since rivers flow through territories of different nation-states, the quantitative and qualitative utilization of water in one state affects water use in another, downstream state. As the demand for freshwater in countries grows, states become increasingly resolute in advocating their respective state rights and in defending their economic interests. Rivers can easily become the object of a disagreement, dispute and even conflict when the interest of one state is not accounted for by a neighboring riparian state. (A riparian is referred to as a state whose territory a water course traverses or whose boundary with another state a water course forms.)

In this paper, I will present the analysis of conflict history in three drainage basins: the Aral Sea Basin, the Ganges-Brahmaputra River system, and the Tigris-Euphrates River Basin. These river systems were selected on the basis of their history of transnational disputes over exploitation of water resources. Although no major military conflicts occurred in any of these basins, the inequitable distribution of water among states and population groups resulted in political tensions that may further escalate into warfare against the backdrop of the constantly growing demand and inadequate policies of states.

Water is among the most precious resources on the planet and its importance will inevitably grow given the changing climatic conditions and the rising demand. Roughly 97 percent of the water on the Earth is salt water and thus is not readily available for drinking or agricultural purposes. Only 2.5 percent of the remaining water stocks are freshwater, but even these are unevenly distributed spatially and temporarily. Two-thirds of these freshwater resources are locked in glaciers and ice caps (Weinthal 2002). One of the overriding realities of the early 21st century is the growing competition between

countries for increasingly scarce water resources. Moreover, while the amount of freshwater on Earth remains constant, the global population continues to increase. The world currently has over 6.5 billion inhabitants, a figure which is projected to climb to over 9 billion by 2050 (UN Population Division 2005). The result is less water on a per capita basis and the growing competition for increasingly scarce water supplies. —Water is a finite and fixed resource, and the rise of the global population has progressively reduced the world runoff per capita, from 40,000 m<sup>3</sup> per person in 1800 to 6,840 m<sup>3</sup> in 1995, estimated to fall further to 4,692 m<sup>3</sup> by 2025” (Furlong, Gleditsch, and Hegre 2006). Currently, more than one billion people do not have access to clean drinking water, and approximately 2.4 billion people do not have access to adequate sanitation. Gleick (1998) indicates that an estimated 80 percent of the diseases in developing countries are water-related. Every day 14 to 30 thousand people, mainly children and elderly, die because of waterborne diseases, or due to water floods and droughts. According to a United Nations study, the world’s 263 international drainage basins account for some 60% of global river flows (UNEP Atlas 2002). The study indicates that around 40% of the world’s population lives in these river basins, which form at least a part of the territory of 145 countries.

Water has always been a critical element of the economies in the modern age as it was the instrument of survival for ancient communities. Being a source of life, water nourished civilizations, provided fuel for conflicts and friendship between groups of people and individuals. Agriculture has always been and still remains the main source of livelihood and subsistence in most countries and the foremost consumer of freshwater. Nowadays, population growth creates pressures on agriculture, resulting in food

deficiency and insecurity. The result is the unprecedented consumption of water across the world. However, of the world's 263 internationally shared rivers, less than one in five is the subject of a substantial international agreement on issues of environmental protection, shared management, or water allocation (Conca and Dabelko 2002). Since rivers provide a lion's share of freshwater, countries that share them are confronted with the necessity of reconciling their needs and demands with those of the neighboring countries because of the peculiar physical nature of rivers that makes them distinct from other types of natural resources. Unlike fossil fuels, on which states tend to claim absolute rights, rivers cannot be divided between the contending parties. Managing a river collectively by a number of countries is the inevitable necessity that all countries have to accept and achieve.

Many political leaders and pundits have consistently stressed that large-scale wars may erupt over increasingly scarce freshwater in the future. For instance, the former United Nations Secretary General Kofi Annan (2001) declared that "fierce competition for freshwater may well become a source of conflict and wars in the future." The 2004 Nobel Peace Prize winner, Wangari Maathai (2004) suggested that:

We face the ecological crises of deforestation, desertification, water scarcity and a lack of biological diversification. Unless we properly manage resources like forests, water, land, minerals, and oil, we will not win the fight against poverty. And there will be no peace. Old conflicts will rage on and new resource wars will erupt unless we change the path we are on.

Other experts have dismissed such arguments as largely exaggerated and political, pointing to a substantial agreement among scholars that disputes over water resources fall short of wars and generally result in cooperative agreements. Since 1814, around 300 treaties have been concluded about non-navigational issues relating to international water resources (Weinthal 2002). Their line of research suggests that disputes over freshwater generally lead to cooperation rather than conflict. According to it, the “water wars” argument does not correspond to a substantial agreement among scholars that for policymakers, military force is always a matter of last resort. Multiple case studies demonstrate that water disputes tend to fall short of conflict. For instance, Slovakia and Hungary found themselves in a dispute over the Danube River and the Gabčíkovo-Nagymaros hydroelectric power plant project. However, unlike many cases of post-Cold War interstate violence, the two countries brought their contention to the International Court of Justice and averted direct military actions. The Mekong River Basin represents another example of sustainable water cooperation, notwithstanding the decades of wars between countries, as well as the 1960 Indus Water Treaty between India and Pakistan. However, in the latter case, the active role of the World Bank proved instrumental in concluding a final water agreement.

Although experience suggests that acute water scarcity may be a factor leading to the conclusion of a water agreement, many agreements have proved ineffective and hardly went beyond the initial stages. Real cooperation has rarely been achieved. Zetoin and Mirumachi (2008) challenge the view that water disputes result in cooperation rather than war, arguing that “various degrees of intensity and methods of conducting conflict tend to mask a conflict’s existence” and suggest that while “a water conflict may fall

short of acute violence, it still has very negative consequences that may be hidden under an apparent air of cooperation.” As a rule, various forms of cooperation are produced by the existence of power asymmetry among riparian nations. For instance, coerced cooperation is predominant in those situations where there is hegemony of one state. Many experts point out that Israel’s military hegemony in the Jordan River basin resulted in some form of coerced cooperation. Induced cooperation generally involves a third party, yet the approach employed is significantly different from that of coerced cooperation. Induced cooperation presupposes the application of incentives for cooperation, instead of force. Non-partisan states and third-party institutions have the greatest influence on the establishment of bilateral and multilateral water regimes among riparian nations. The Indus Water Treaty is a good case in point where the World Bank played a central role in inducing Pakistan and India to come to terms about a shared management of their water supplies.

### **Establishing Water Regulation Regimes**

There are two approaches as to how to regulate water sharing in a transboundary river basin. The social planner approach revolves around a supranational structure which is created to handle the water affairs among riparians. It assumes the delegation of authority and responsibility by state parties to an intergovernmental organization which is formed by their mutual and collective agreement:

A central planning authority who knows what is best for society – a social planner who views the region as one planning unit. The social planner maximizes regional welfare subject to all available water resources in the



region and given all possible water utilizing sectors. In some instances, the social planner also includes preferences. (Wolf 1996, 18)

The second approach centers on market regulation, whereby each riparian nation pursues individual gains from the engagement in a basin-wide bargaining game. Game theory provides a conceptual reference point for a market-driven water regime. The efficient allocation of scarce water resources among states is achieved via market approaches. However, Wolf questions the utility of the market-centered approach, claiming that “economic considerations alone may not provide an acceptable solution to water allocation problems, especially allocation disputes between nations” (Wolf 1996, 19).

Game theoretical approaches constitute the core of multiriparian water regimes. The basic assumption of game theory is that decision makers are rational players, that they are intelligent, so, while pursuing well-defined objectives, they take into account other decision-makers’ rationality and build expectations on their behavior (Dinar, Dinar, McCaffrey, and McKinney 2007). The involved countries are acting as players with specific options and thus form strategies according to the corresponding payoffs and the counter-player’s strategies (Eleni and Yannis 2008). Each country-player adopts a certain strategy provoking the reaction of the opponent party, while all the actions are characterized by a rational behavior aimed at the maximization of payoffs. “One of the main characteristics of the theory is the cooperative approach, which can be utilized effectively in competitive cases – proving the benefits of cooperation and converting the players’ relations in cooperative” (Eleni and Yannis 2008, 467). The overriding principle is that a military conflict between states is unacceptable within the realm of game

theoretical approaches. However, a conflict of interests is central to driving a market water system. It facilitates the progress of a water regime. Open bargaining techniques and the transparency of interactive processes between players provide strong conciliatory mechanisms.

Yaron (2002) applies game theory models to assess the economic value of cooperation and noncooperation between Israelis and Palestinians over their shared water resources. He concludes that whether or not a solution to the regional water problem will be of a cooperative or noncooperative nature will depend on several political, institutional and economic considerations that may or may not be in place (Yaron 2002). Using a game theory model, Dinar and Wolf (1994) evaluate the idea of trading hydroelectricity for interbasin water transfers among neighboring nations. They attempt to develop a broader, more realistic conceptual framework that addresses economic and political issues. Their model allocates potential benefits from trade among cooperators. The main findings are that economic merits exist for water transfers in the region, but political considerations may harm the process.

As the process of globalization drives the world toward a more interconnected realm of interdependent, albeit sovereign states, the nature of the norms that regulate the relations between nation-states transforms rapidly. Unlike the traditional international system of sovereign states, the yet infant transnational system of global governance seeks to establish supranational laws, regulations, and institutions whose authority extends beyond and within nation-states. Nation-states continue to exist, but they must be subordinate to transnational authority and laws. This authority is exercised by the

definitions of international law, transnational courts and myriad UN conventions that establish global norms.

The UN Convention on the Non-Navigational Uses of International Watercourses (1997) embodies the first international effort to resolve the perpetual conflict of interests over water use. It stresses the utilization of rivers in an “equitable and reasonable manner”, taking into consideration the geographic, hydrographic, hydrological, climatic, ecological and other factors of a national character, as well as the social and economic needs of the watercourse states concerned. In addition, the Convention underscores that the interests of all populations dependent on a watercourse be respected and supported by all possible means.

Under the Convention, if an upstream country is in a dire need to construct a dam in its territory, it has to be done in such a way as not to infringe the water rights of the populations in the neighboring countries and not to cause a substantial harm to the ecology of the entire basin. The UN Convention on the Non-Navigational Uses of International Watercourses is considered to be an international framework agreement for use by states in negotiating water disputes. Most importantly, it put to rest the longstanding conflict between the principles of absolute territorial sovereignty, or the Harmon Doctrine; and absolute territorial integrity. The Harmon Doctrine advocates for the right of an upstream state to do as it wishes with the water in its territory—regardless of the adverse affect on downstream states; whereas the Convention defends the right of a downstream state to an uninterrupted flow of a fixed quantity of water from upstream states. The main principle enshrined in the Convention is that of the limited territorial

sovereignty. It underscores the equitable utilization and the obligation not to cause a significant harm.

The Convention is to be used as a reference point in each of the transboundary river basins. Today, however, most riparians tend to advocate for the principles that are in line with their sovereign economic interests—that is, upstream countries often refer to the principle of absolute territorial sovereignty when advocating their plans to unilaterally use water flows; and downstream countries support the principle of absolute territorial integrity because it renders their water flows unaltered. Only 16 out of 35 countries needed for the Convention to enter into force have ratified, accepted, approved or acceded to it (Dinar, Dinar, McCaffrey, and McKinney 2007). Solid basin-wide cooperation requires the unanimous commitment to the principle of equitable utilization of watercourses enshrined in the Convention and the subsequent participation in the benefits derived from the water by all communities sharing the basin.

The UN Convention encourages the institution of international water regimes to initiate and sustain water sharing and protect the environment. Currently, there are different perspectives as to how international water regimes are founded. According to a realist perspective, international water regimes form because of a sharp asymmetry in the military and economic power among states. Consequently, international regimes are created to serve the interests of hegemonic powers and when their potentials decline, regimes weaken and collapse. In contrast, neoliberals contend that international regimes come into being as a result of demand. While different situations exhibit various forms of cooperation with varying degrees of coercion, the demand for regimes is always present where a river is shared by at least two countries.

A comprehensive water regime needs to include a wide array of solutions so as to accommodate the diverse interests, strategies and values. Dinar and Wolf (1997) argue that economic efficiency alone is not sufficient for cooperation, especially when it is related to the allocation of a scarce resource, such as water. Furthermore, the authors develop a framework for analyzing the economic and political aspects of cooperation and demonstrate, using the case of trading Nile water, how regional cooperative arrangements based only on economic considerations are inferior to arrangements that likewise take into account political considerations.

Just and Netanyahu (2004) discuss cooperation in the context of a multiriparian river basin. According to them, coalitions are more sustainable when they incorporate a smaller number of players, rather than a larger number. This may be relevant in cases where cooperation is lacking, yet a large number of riparians can make treaty formation difficult, if not impossible. The authors argue that multilateral coordination in river basins with a large number of riparians may have to be preceded by bilateral agreements first – since they are easier to sustain. Nevertheless, bilateral treaty formation can be conducive to the alliance-building processes within a basin, whereby states or groups thereof can become confronted on water issues. By and large, bilateral treaty formation occurs between countries similarly positioned in terms of geopolitical influence or where the convergence of their strategic and economic interests is significant. Otherwise, a grand coalition incorporating all river riparians is the solution. However difficult to accomplish, it is associated with the highest total benefit from cooperation.

### **The Assessment of Conflict Probability in the Aral Sea Basin**

With the demise of the Soviet Union, Central Asia became engulfed in the cycles of interstate disputes related to the utilization of regional waters. The Amu Darya and the Syr Darya Rivers have become the main sources of contention after the five republics gained their independence and the central authority in Moscow was no longer responsible for handling the regional water affairs. Common ideological and political goals gave way to sovereign nation-building projects in which water is used as a strategic instrument of exerting the political pressure on the neighboring states and an impetus for economic growth and social development. The rivers are now part of intensive debates between upstream and downstream nations.

The Aral Sea Basin is formed by two of the largest rivers of Central Asia – the Amu Darya and the Syr Darya. The source of the Amu Darya is largely in Tajikistan, with a few watercourses originating in northeastern Afghanistan. The Syr Darya originates mainly in Kyrgyzstan. The Basin covers the areas of Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, as well as the southern part of Kazakhstan and the northern part of Afghanistan and Iran (Dukhovny, Sokolov and Mukhamadiev 2006). Tajikistan contributes 80% of the flow generated in the Amu Darya river basin, followed by Afghanistan (8%), Uzbekistan (6%) and Kyrgyzstan (3%). Turkmenistan and Iran together contribute around 3%. Although it carries less water than the Amu Darya, the Syr Darya is the longest river in Central Asia. It flows from the Tien Shan Mountains, along the borders of and across four states – Kyrgyzstan, Uzbekistan, Tajikistan and Kazakhstan – before flowing into the Aral Sea. Kyrgyzstan contributes 74% of the river flow, followed by Kazakhstan (12%), Uzbekistan (11%) and Tajikistan (3%). Both rivers

have an extended network of dams, reservoirs and irrigation canals, resulting in one of the most sophisticated water systems in the world.

The old Soviet water sharing system remained in place until recently when the countries became confronted with the sky-rocketed world prices on fossil fuels and when the old system of barter deals proved inefficient devoid of the central command authority. The inability to purchase natural gas from abroad forced Kyrgyzstan and Tajikistan to switch in the operation of their main water reservoirs from irrigation to power generation. This resulted in a change of the natural regime of the Amu Darya and the Syr Darya rivers. Winter floods became frequent and river runoff during the vegetation period was considerably reduced. This resulted in the reduction of the productivity of irrigated areas and increased the economic losses in irrigation farming in Uzbekistan and Kazakhstan, especially during low-water periods.

Today, water policies are antagonizing neighbors and in some cases leading to conflict. Current water management practices, where each state is exploiting water at the expense of its neighbors while paying no respect to cooperation, are not sustainable. Soviet engineers designed the water regulation system in such a way as to provide downstream Uzbekistan and Turkmenistan with sufficient amounts of water during their crop seasons in the summer, whereas the hydroelectric facilities in the territories of upstream Tajikistan and Kyrgyzstan were intended to control water flows, generate electricity and prevent flooding. Downstream riparian nations were the core of the Soviet plans of expanding their agricultural productivity, mainly through water-thirsty crops – cotton and rice. The gargantuan river diversion projects that were intended to feed the extensive irrigation networks ultimately led to the most devastating environmental and

social impacts in the entire Aral Sea Basin. The fourth largest lake in the world had lost two-thirds of its original volume in a matter of few decades. Accompanied by the disintegration of the Soviet Union, it led to severe economic impacts for the nations of the region. Industries and communities that depended on the sea vanished and competition for increasingly scarce water has been rising among the growing populations ever since. The aspirations of the Soviet leaders to surpass the West during the Cold War by all means, including human and environmental, resulted in enormous costs that continue to plague the entire region.

By early 1980s, the Soviet Union became the second largest cotton producer in the world, accounting for nearly 20 percent of the world's production. To achieve economic growth, Soviet planners thus allocated most of the available water resources in Central Asia to develop and support a monocrop economy, not taking into account the social costs in terms of the health of the population and the consequences for the environment (Weinthal 2002). Allouche (2007) claims that the Central Asian water crisis is more the result of bad management and disproportionate allocation among the riparians than the consequence of scarcity. The deeply flawed management system, endemic corruption, poor irrigation networks, weak governance structures, absence or lack of political will and a reduction in external involvement and investments all contribute to and exacerbate the crisis in the Aral Sea Basin.

While outright resource wars have been avoided, the five nations have been at odds with each other adopting a zero-sum attitude – each country acts to maximize its water allocation to either sustain high levels of cotton cultivation or produce excess amounts of hydroelectricity for exporting purposes without reference to regional needs,



planning, or the consequences to the environment of the basin. Cotton cultivation evolved into the dominant economic activity in Turkmenistan, Tajikistan, and Uzbekistan. In Uzbekistan alone, the cotton sector produced more than 65 percent of the republic's gross domestic output, consumed 60 percent of all resources, and employed approximately 40 percent of the labor force by the mid 1980s; the republic accounted for approximately two-thirds of the cotton produced in the Soviet Union (Weinthal 2002).

The countries of Central Asia are among the poorest in the world in terms of their GDP and per capita incomes. The majority of the population in the republics is employed in the agricultural sector and is highly dependent on subsistence crops. The aspirations of upstream countries to increase their hydropower generation capacities by constructing massive dams and power generation facilities without a proper consideration of the potential environmental and political effects threatens to disrupt the existing regional agreements and lead to conflicts. The Rogun dam, in Tajikistan, is planned for a height of 335 meters. The construction started in 1976, but never finished since the break-up of the Soviet Union and Tajikistan's subsequent civil war brought construction to a halt in 1991. Now the Tajik government plans to complete the project without regard to the principles enshrined in the UN framework convention. Unilateral diversion of river flow will diminish the existing level of cooperation in the region and lead to contention. The construction of the Rogun dam, which Tajikistan sees as the only viable solution to the ongoing economic recession, will substantially reduce the river flow in downstream countries. The dam is being built on the Vakhsh River. It includes other riparian states that might be seriously affected by the disruption of river flow.

The impounding of a reservoir behind a dam generally reduces the water flow downstream to zero. It is during this period that conflicts are most likely to erupt. For instance, the impounding of the Ataturk Dam in Turkey impeded the water flow of the Euphrates River in Syria and Iraq for one month. Although no open military conflicts occurred over that period, the countries officially protested unilateral undertakings of such nature. Water facilities can become targets for airstrikes and ground military operations that may well escalate into a large-scale interstate war.

However, even if Tajikistan were able to attract the necessary investments for the projects, the country would encounter significant problems in selling the surplus power generated, as the current electrical energy grid in the region is focused in Tashkent, the capital of Uzbekistan. To resolve this problem, Tajikistan is teaming up with Kyrgyzstan to create a north-south transmission line to link the two states with Kazakhstan and bypass Uzbekistan altogether (Allouche 2007). Most recently, Tajikistan's government launched the Initial Public Offering (IPO) to facilitate nation-wide investments for the Rogun power plant project. International donor organizations and external state actors refuse to invest in such projects as they tend to destabilize the political situation and create environmental hazards.

Large-scale unilateral construction projects on rivers can be vulnerable to attacks by the opposing countries, such as in case of Israel and Syria. Israel conducted airstrikes against targets in Syria when it attempted to disrupt the water flow to Israel by building dams on the Jordan River. Once built, however, dams act as deterrents of interstate conflict. Massive hydroelectric facilities, such as dams, are large enough to pose an enormous environmental threat to the entire region in case of destruction or significant

damage. As a result, a protective aura of illegitimacy also develops to make attacks on these targets less likely after they are built. For example, although the Israelis have stated that they do not regard the Aswan High Dam as off-limits to military attack, they are aware of the enormous price they would have to pay in international condemnation, costs to the ecosystem and populations of the basin. If such a major hydro installation were attacked, the reaction on the part of the victim would be extreme. Therefore, large-scale hydro facilities probably restrain conflict, yet if attacked, they seriously aggravate it. Upstream countries have not been able to produce sufficient amounts of hydroelectricity because the water levels in their reservoirs remained low as a result of climatic changes in the basin. The degrading water supply system will soon become inoperable, if further investments are not secured to finance their reconstruction and replacement. The population of Central Asia is expected to double in the next fifty years. Unilateral development projects on rivers can only aggravate water scarcity and provoke some form of hostility. Therefore, it is highly important to make a special consideration not only of the potential dangers to the environment, but also of the social and economic costs that such projects are likely to produce across the border.

Weinthal (2002) asserts that international aid organizations and INGOs had contributed to enhancing the regional cooperation and reinforced the republics' sovereignty in early to late-1990s. According to her, the absence of substantial interstate water conflicts in the region after the dissolution of the Soviet Union can be explained by the desire of the elites in the five republics to consolidate statehood through the accumulation of credibility and international recognition. In other words, it was in the national interests of all republics to cooperate on water issues. The active role of the

international community in the form of IOs and NGOs impels institution building at both the international and the domestic level by simultaneously inducing cooperation and reinforcing empirical sovereignty. “If these transnational actors did not behave purposively and assume such a comprehensive role, other outcomes might have transpired such as inertia, a different form of state building, or a lack of cooperation” (Weinthal 2002, 67).

However, now that the states have gained a degree of international recognition, they more often tend to ignore the principles set forth in the 1992 Almaty Declaration. Efforts to institute an effective regional water governance system have proved ineffective, and increasing tensions are threatening regional security. Without genuine cooperation in the region, one might expect political and economic instability, and increased local violence. The 1992 agreement on water sharing in Central Asia represented a quick response to a very fluid and ambiguous situation. It did not constitute sustainable environmental cooperation among independent actors with well-defined interests. Weinthal (2002) explains the initial success of cooperative efforts as inertia – “not wanting to disrupt from past practices, especially since the leaders were essentially concerned with bringing in the cotton harvest” (p. 125). The Almaty Agreement established the Interstate Commission for Water Coordination (ICWC), which was composed of the five ministers of water management. The ICWC has a number of deficiencies that inhibit the functioning of the organization in an adequate fashion. The most important one is that this institution has been created under a strong influence of international organizations and states have been quite reluctant to cooperate thereafter. The result is that many commitments and agreements are not honored. Another problem

lies in the structural nature of the organization, flawed representation scheme, and the location of the headquarters in Uzbekistan, making it appear as a special-interest institution.

### **Water Tensions in South Asia**

The Ganges-Brahmaputra-Meghna River basin covers the areas of China, India, Bhutan and Bangladesh. The GBM basin is the most populous area in the world with a population density of around 700 per sq. km. The basin as a whole, covers approximately 1% of the Earth's total land surface, is home to 10% of the world's population and contains the largest concentration of poor on the planet (Giordano, Giordano, and Wolf 2002). Moreover, the region experiences one of the highest population growth rates in the world. Political collisions and military conflicts among nations have become common after the partition of the British India into the independent states of India, Pakistan and Bangladesh.

Water occupies a critical niche in the domestic economies of all countries and the demands for freshwater resources will undoubtedly increase along with the rising consumption. –Agriculture accounts for nearly one-half of all freshwater usage in the basin, making water supply one of the most significant barriers to economic development” (Dinar, Dinar, McCaffrey, and McKinney 2007, 254). The GBM system is considered to be one transboundary river basin even though the three rivers of this system have certain distinct characteristics and flow through very different regions for most parts of their lengths. The disproportionate spatial and temporal distribution of water flows results in some adverse environmental effects. For instance, during the monsoon season,

from June to October, there is abundant water, but during non-monsoon months the countries become water-stressed (Rahaman 2006).

The conflict over the Ganges water between Bangladesh and India dates back to 1951 when India decided to construct the Farakka Barrage in order to divert water from the Ganges to the Hooghly River by a 42-kilometer long feeder canal (Rahaman 2006). The unilateral diversion of the Ganges water by India at Farakka Barrage has caused a series of adverse environmental and ecological problems in Bangladesh (Khalequzzaman 1993). The Farakka Barrage gave India significant control over the water flow in Bangladesh. Since most of Bangladesh's water sources originate outside its territory, it became vulnerable to any quantitative and qualitative impacts caused by actions in India. These impacts include shortage of water flow in the dry season affecting irrigated agriculture and devastating floods in the wet season. The Farakka Barrage has contributed to 50% decline in the dry season flow of the Ganges in Bangladesh (Dinar, Dinar, McCaffrey, and McKinney 2007). Wilson questions the utility of the Farakka Barrage:

It is difficult to tell how far it has contributed to the increase in the draught of the Hooghly, but it has not rescued Calcutta Port. The decline of the port was not caused by physical constraints on the river, but by the slow rate of industrial growth in the hinterland of the port. (Crow, Lindquist, and Wilson 1995, 158)

India prefers to negotiate water sharing with its neighbors bilaterally whose leaders have signed separate treaties, agreements and memorandums with Nepal, Bhutan and Pakistan on water sharing of the Ganges, Brahmaputra and Indus rivers, respectively.

Bangladesh prefers the involvement of all riparians in the designing of a regional water resources development plan. Bangladesh, as a weaker nation, has long been trying to attract the attention of the international community to the problem of deficient water supplies as a result of India's actions upstream. The lack of a workable management plan for water allocation to Bangladesh has created a situation where irrigation of crops and navigation are impossible during the summer months. Although the 1995 Water Treaty between India and Bangladesh explicitly upholds the principle of equitable and reasonable utilization of water supplies, the Treaty does not provide any mechanism to approach other riparian countries of the Ganges basin for finding out a long-term sustainable solution of the current crisis and for integrated management of the basin (Rahaman 2006). In addition, the Joint River Commission has not been equipped with a significant political authority and responsibility to implement the terms of the Treaty. This constitutes a serious impediment to the achievement of a solid bilateral cooperation between the two countries. There remains little doubt that if countries like India remain reluctant to discuss or address the question of water allocation on a multilateral basis, problems of water scarcity will persist and populations will be facing even greater economic challenges. This can threaten the regional peace and lead to internal instability, growing terrorist activities and international conflicts. It is essential for the hegemonic countries to engage in the multilateral negotiation of allocation and regulation of shared water resources.

Cooperation over the Indus River between India and Pakistan is a demonstration of the potential for collaborative action yet to be explored in the GBM basin. Despite the cycles of interstate hostility between the two countries, nuclear test explosions, ongoing

terrorist activities in the region, the Indus Water Treaty remained intact and continued to function. The agreement over the Indus River allowed for the division of the river's tributaries between India and Pakistan. The nature of the agreement and the involvement of the World Bank in the negotiation of the Treaty contributed to building cooperative relations between the two countries. In the end, the World Bank became signatory to the Indus Water Treaty.

Collaboration between Bhutan and India represents a salient example of how transboundary water bodies can be used as an engine for economic growth or development of an impoverished region with concomitant benefits to each country (Biswas 2008). Following water cooperation initiatives have meant that Bhutan's per capita GDP has increased from being the lowest of any South Asian countries in 1980s, to being the second highest in the region at present, within a very brief time span of only a little more than two decades (Biswas 2008). Many experts suggest that exploring Nepal's extensive hydro potential collectively could boost the regional welfare. Bhaduri proposes that a market-based water transfer has great relevance in resolving the transboundary water conflict between India and Bangladesh (Bhaduri and Barbier 2003). Water transfers from Nepal would augment the flow of water at Farakka during dry seasons and periods of drought.

Ultimately, the efforts to eradicate terrorism and diminish interstate hostility will largely depend on how well all countries of South Asia and the international community will commit themselves to addressing the problems of endemic poverty, low living standards, lack of access to adequate water supplies and the spread of disease by



promoting a cohesive and joint water regulation system. India's cooperation in addressing the regional economic challenges is of foremost importance for success.

### **The Dynamics of Water Tensions in the Tigris-Euphrates River Basin**

The Tigris and the Euphrates river systems are often considered to form a single basin because both rivers in the Shatt-al-Arab waterway converge shortly before emptying into the Persian Gulf. Both rivers originate in Turkey, traverse Syria and Iraq. The Euphrates River is the longest in the Middle East. It originates in the eastern part of Turkey, between Lake Van and Black Sea. It is estimated that 40% of the Euphrates River is confined by Turkey's boundaries, while 25% is in Syria and 35% in Iraq. According to Akanda, Freeman, and Placht (2007), disputes over water allocation between the three countries are likely to aggravate in the future. Driven by a number of objectives, the riparian countries have often been at odds over the utilization of the Euphrates River waters. Food and energy security are the primary concerns for Iraq and Turkey. Population growth amplifies the demand placed on food and energy supplies and increases the prospect of further discontent over the existing water allocation quotas. Both Syria and Iraq have announced their goals of developing food sufficiency programs, whereas Turkey's hydro-energy development plans threaten to undermine any of the proposed downstream projects without a joint consultation and management strategy.

Being an upstream country, Turkey enjoys a substantial degree of control over the Tigris and the Euphrates Rivers. The initiation of the Southeastern Anatolia Project (GAP) by Turkey has created exceeding pressures on the water system of the rivers. The project includes the construction of 22 dams, 19 hydropower plants and irrigation facilities to serve 1.7 million hectares of land, totally owned by the local population of

the region (Kibaroglu and Unver 2000). Turkey aspires to reduce the dependence on expensive fuel imports by producing at least 40 percent of its required energy from domestic hydroelectric sources. The GAP hydroelectric project was expected to save the country about 28 million tons of oil imports annually. In 2001, Syria and Iraq were net exporters of fuel as opposed to Turkey, which, significantly had to import approximately 63 percent of fuel (Akanda, Freeman, and Placht 2007). Turkey's leaders often refer to the country's hydro resources as their only natural assets; in the same manner oil is treated in Iraq and Syria. As was mentioned earlier, claiming absolute rights on river flows poses dangers to international peace in the region. Turkey's leaders contend that while the water is in Turkish territory, it is the sole property of Turkey. Turkey may choose to obstruct, divert, sell or even share it, but the water flows remain the exclusive property of Turkey just as oil is the property of the Arab state in which it sits. –However, as the modern move away from the Harmon Doctrine and recent internationally adopted definitions of watercourses illustrate, the comparison drawn between Arab oil and the waters of the Euphrates-Tigris is inaccurate” (Hakki 2006, 9). –The loss of one-half and two-thirds of Iraqi and Syrian water supply, respectively, from the Euphrates Basin is a viable cause for alarm” (Hakki, 2006, 4).

Turkey is the only country in the Euphrates basin to not have signed the UN Convention on the Non-Navigational Uses of International Watercourses. According to sources in Turkey, if signed, the Convention would give the other riparian nations a veto power over Turkey's development projects. The GAP project has strong political implications since it aims to develop the part of the country mainly populated by ethnic

Kurds. This would enable the Turkish elites to consolidate their rule throughout the nation and eliminate all forms of dissent.

Syria and Iraq insist on the equal division of waters of both rivers, while Turkey contends that the equality approach would not meet its energy and agriculture needs and instead proposes an equity-centered solution. Turkey's leaders maintain that their population demands are higher than in the neighboring countries; therefore, pursuing higher water allocations from the Tigris-Euphrates system is in line with international normative standards.

Ultimately, it is probable that Turkey will be compelled to negotiate a feasible water agreement in order to secure a peaceful regional environment. International peace is the essential condition for promoting the domestic economic growth and development – the fact that the leaders of all riparian countries have to accept and achieve. More importantly, Turkey is obliged to engage in the trilateral talks concerning appropriate water allocations in order to secure external funding and membership in the European Union. Syria and Iraq are also expected to participate in the water negotiations in order to win the international trust and recognition in the wake of the internal political instability in these countries. The riparian countries have a full potential to stimulate the processes leading to the formation of a basin-wide economic system and an integrated water management structure whose underlying goal would be to promote the sharing of benefits among nations. Enhanced trade links will inevitably reduce interstate hostility and suspicion. It will be important to include Iraq in any of the cooperative arrangements so as to foster a basin-wide effort. Interdependency links engendered by a collective management of water will assist in the transition processes in Iraq and help build a solid

market economy and free society there after decades of political turmoil. Hakki (2006) asserts that —one way in which Turkey might contribute to alleviating the water dispute with Syria and Iraq is through exportation of electricity through bargain prices” (p. 16). In return, the countries can supply oil and gas to Turkey and receive sufficient amounts of water for irrigation and consumption.

Experience suggests that external actors, whether countries or international organizations, can be instrumental in initiating a dialogue between the three countries. Akanda, Freeman, and Placht (2007) propose that —only an external mediator has the ability to highlight the incentives and frame the issues in such a way that each country believes it has something to gain by coming to the table and something to lose by avoiding negotiations” (p. 5). Each country has put forward an approach for how water should be shared in the region. Syria and Iraq propose the vastly different methodology of sharing river flows. The task for the mediators would be to reconcile these diverging approaches to shared rivers.

### **Conclusions and Implications for the Future**

The case studies examined in this article demonstrate that unilateral diversion of rivers can provoke political and military tensions and destabilize the economic security in drainage basins. Water scarcity will add fuel to interstate contention and instigate water wars absent proper precautionary measures. Population growth, environmental deterioration and climate change conditions may diminish the quality and quantity of potable water, result in natural disasters of even greater magnitude and further increase a social discontent across the planet. Under these adverse circumstances, unilateral diversion of water flows can ignite international conflicts and lead to significant human

and environmental losses. The unprecedented global population growth will inevitably stimulate the competition for freshwater and create extreme pressures on governments, under which it will be difficult to ignore the interests of all riparian nations while pursuing sovereign economic interests associated with the exploitation of water flows.

Many studies related to water resources underscore that disputes over freshwater tend to fall short of conflicts and generally result in a peaceful resolution. Yoffe et al. (2004) found that international relations over freshwater resources are overwhelmingly cooperative and cover a wide range of issue areas, including water quantity, quality, joint management and hydropower. However, in the future, certain river basins may be more likely to give rise to interstate hostility than others because of record-breaking population and poverty growth rates. The falling availability of freshwater on a per capita basis in the developing world can easily provoke a social discontent and lead to a large-scale warfare between and within countries. It is therefore imperative to direct more resources and potential into these regions in order to mitigate these dire situations, promote and sustain multinational water regimes and the sharing of benefits from the collective exploitation of water flows.

Unilateral practices of water diversion are conducive to inequitable distribution of water quantities which provides fertile ground for contention and conflict among nation-states and social groups. Social and economic security of populations is essential for promoting and sustaining peace in river basins. Inequitable distribution of water among states fosters perceptions of injustice and situations of insecurity among populations of river basins and results in ways of seeking redress that go beyond the limits set forth by international legal norms and treaties. State policies have to aim to promote the rights of

populations to freshwater and to the benefits from the exploitation of water flows not only within the territorial confines of their nation-states but also with an eye on the needs for water across their borders so as to achieve a basin-wide peace and sustainable economic development. Since peace is the essential condition for the long-term development and stability, states have to increasingly accommodate the interests of all the populations inhabiting a river basin as it will maximize the benefits of multinational water treaties and reinforce a political stability.

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