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**WATER RESOURCES AND SECURITY ISSUES IN THE
MIDDLE EAST: THE NEXT ARENA OF FUTURE CONFLICTS**

by

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ABSTRACT

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TITLE: WATER RESOURCES AND SECURITY ISSUES IN THE MIDDLE EAST: THE NEXT ARENA OF FUTURE CONFLICTS

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Water resources in the Middle East are pivotal in the development of bilateral and multilateral regional relations. In this respect, the interrelated politics of water resources and security issues have historically influenced regional politics and resulting armed conflicts, and will continue to do so in the future.

This SRP analyzes various sources and parameters of conflict that relate to certain well known rivers and their water resources in the Middle East. These are the Jordan River Basin, the Nile, and the Tigris and Euphrates Rivers. The SRP analyzes such issue areas as the domestic and transnational water resource management with a focus on the Jordan River Basin, and the domestic policies on water resources that have a transnational effect by examining Turkey's GAP project. The SRP also examines the likely forms of military conflict scenarios that may relate to transnational water disputes. The SRP reaches the conclusion that the application of international law and fundamental economics can provide the solutions in transnational water disputes in the Middle East.

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WATER RESOURCES AND SECURITY ISSUES IN THE MIDDLE EAST: THE NEXT ARENA OF FUTURE CONFLICTS

Water resources in the Middle East are pivotal in the development of bilateral and multilateral regional relations. In this respect, the interrelated politics of water resources and security issues have historically influenced regional politics and resulting armed conflicts, and will continue to do so in the future. Since water is an essential but scarce resource in the Middle East, it has played a significant role in the formation of regional bilateral and multilateral relationships and resulting armed conflicts since antiquity. The control of water resources in the Middle East was not only a primary cause of basic tribal warfare, but it was also a fundamental contributing factor for armed conflict between ancient nation-states and empires.¹ The river water resources in the Middle East have been, are, and will continue to be essential commodities for human, social, economic, and political survival of various nation-states in a traditionally volatile region.

Water resources affect fundamental bilateral and multilateral political, economic, social, and security relationships in the Middle East, because both the origin, flow, and use of these water resources transcends existing national boundaries. For example, approximately 60% of the river water resources that are utilized by a number of Arab nations in the Middle East, do not originate within their respective national boundaries. Thus, the direct control of these water resources by other nation-states provides them with the means to exert various types of political, social, economic and security influence and pressure on certain Arab countries in the Middle East.² Noticeably, the U.S. Central Intelligence Agency (CIA) has observed the following with respect to the global trends that affect global water resources and their significance for the Middle East region:

Water has been a source of contention historically, but no water dispute has been a cause of the open interstate conflict; indeed, water shortages often have stimulated cooperative arrangements for sharing the scarce resource. But as countries press against the limits of available water between now and 2015, the possibility of conflict will increase.

Nearly one-half of the world's land surface consists of river basins shared by more than one country, and more than 30 nations receive more than one-third of their water from outside their borders.

- Turkey is building new dams and irrigation projects on the Tigris and Euphrates Rivers, which will affect water flows into Syria and Iraq—two countries that will experience considerable population growth.
- Egypt is proceeding with a major diversion of water from the Nile, which flows from Ethiopia and Sudan, both of which will want to draw more water from the Nile for their own development by 2015. Water-sharing arrangements are likely to become more contentious.

Water shortages occurring in combination with other sources of tension—*such as in the Middle East*³ will be most worrisome.

The transnational control and utilization of river water resources in the Middle East has broader geopolitical implications and linkages. For example, certain Arab states view with outright apprehension the degree of control that Turkey exercises over the flow of the Tigris and Euphrates Rivers. This apprehension is not lessened by the fact that Turkey – a Muslim nation-state – is a member of the NATO Alliance, and a fundamental partner of the U.S.-Israel-Turkey axis.⁴

The present Strategic Research Project paper focuses on the interrelated political and security issues for the water resources of the Tigris-Euphrates basin, the Jordan River basin, and of the River Nile.

HISTORICAL OVERVIEW

The river water resources of the Middle East are linked not only with the history of the Middle East in and of itself, but they also played a crucial role in the development of various civilizations, including what is commonly called the Western Civilization. Indeed, the rivers of Tigris, Euphrates, Jordan, and the Nile have been known since the more distant times of antiquity. They influenced the formation of such ancient civilizations and nation-states as those of Assyria, Babylonia, Egypt, Israel, Persia, etc. These rivers also became routes of trade and foreign conquest with the appearance and the establishment of empires by European powers in the Middle East and Asia, (e.g., the empires of Alexander the Great and of Rome). Following the creation of the Eastern Roman (Byzantine) Empire, these rivers also became geographic conduits for the meeting and the clash between Islam and Christianity, and the evolution of the Arab identity and civilization. The entry of the Ottoman Turks eventually brought control of these rivers under the auspices of the Ottoman Turkish Empire.

The presence of the Ottoman Turkish Empire, the British colonial influence over the affairs of Egypt and the Sudan, and past demographic and economic conditions did not create any major issues over the control, management and use of the water resources of the Tigris, Euphrates, Jordan and Nile rivers. However, the significant geopolitical changes that were brought about at the end of World War I (WW I), fundamentally changed both the national boundaries and the framework of international relations in the modern Middle East. The reduction of the Ottoman Empire to what now is the modern Turkish Republic transformed the Tigris and Euphrates into “international rivers.”⁵ In the 1920s, certain agreements (including the Treaty of Lausanne of 1923) were concluded between Turkey, France and Great Britain, and addressed Iraq's downstream water rights in the Tigris and Euphrates Rivers that originate in Turkey. Iraq and Turkey also entered into the 1946 Treaty of Friendship and Good Neighborliness which contemplated a certain degree of cooperation between the two countries if Turkey were to proceed with construction projects on the two rivers (each dam construction project could become the subject of a “special agreement” between Iraq and Turkey). Although numerous meetings and conferences have taken place between Iraq, Syria and Turkey regarding the control and use of the Tigris and Euphrates river water resources, the Iraq-Turkey 1946 Treaty remains the last formal bilateral agreement that addresses this subject. Although Iraq no longer chooses to rely on this Treaty since it believes that it unnecessarily cedes control of the Tigris and Euphrates to Turkey, Iraq has not formally repudiated this Treaty.⁶

The initial lack of formal agreements on the control and use of the Tigris and Euphrates water resources also affected the relationship between Iraq and Syria. In the mid-1970s, the political hostility that existed between the respective Baathist regimes in Baghdad and Damascus encompassed Iraqi criticisms of a Syrian dam project on the Euphrates. The political disagreements and water resource criticisms developed into a crisis that included the movement of military forces by both Iraq and Syria to their respective border areas. Active intervention by Saudi Arabia and the Arab League eventually resolved the crisis and assured an increased flow of Euphrates water from Syria into Iraq.⁷

During the 1980s, Iraq, Syria and Turkey established a tripartite technical committee for the exchange of information on the Tigris and Euphrates river water resources. Since the late 1960s Turkey had embarked on the massive South-East Anatolia Project (Turkish acronym GAP), that involved the construction of no less than 22 dams for irrigation and hydroelectric power generation.⁸ Turkey's motivation for committing to the massive and very expensive GAP project appeared to be based on purely domestic political, economic, social and security considerations. Southeastern Turkey was and still is an economically underdeveloped region.

At the time that Turkey decided to proceed with the GAP project, Turkish government forces were battling the Kurdish Workers' Party (*Partiya Karkere Kurdistan* – PKK) guerilla movement in the region. Turkey succeeded in its military campaign against the PKK by 1999, while the cost of that campaign reached \$8 billion annually.⁹ Turkey was and still is highly dependent on imported oil from Middle East countries for its domestic energy needs. Thus, the development of the Tigris and Euphrates hydropower potential could lead to the substitution of energy sources for the Turkish economy and the conservation of very valuable foreign currency reserves.¹⁰ Furthermore, leaders of various Turkish governments and political parties such as Suleyman Demirel and Turgut Özal were intimately involved in their professional and political careers with the development of Turkey's water resources.

However, the scale of the GAP projects and their cumulative impact on the downriver flow and availability of Tigris and Euphrates waters has convinced both Iraq and Syria that Turkey's GAP project constitutes a strategic threat to their national security. In short, both Syria and Iraq fear that the GAP projects provide Turkey with a "water weapon" that can significantly curtail water supplies for both of these Arab nation-states. Furthermore, the GAP projects will undoubtedly enhance Turkey's economic and political power in the region as will be discussed in more detail in another section of this paper.¹¹

While Palestine was still under the British mandate following the end of WW I, Jewish immigrants that arrived there under the auspices of the Balfour Declaration planned not only for the establishment of an independent Israeli state, but also for the control of the water resources that could sustain it.¹² The creation of the State of Israel in 1948 and the 1948-1949 conflict that resulted in the expulsion of large parts of the indigenous Palestinian Arab population eventually put the control and use of the water resources of the Jordan River Basin and of existing aquifers at issue. Given the non-existence of a formal peace between the Arab states and Israel, and the presence of a large Palestinian refugee population, any attempt at resolution of regional water resource issues presented very difficult political and technical problems. For example, Israeli plans involving the diversion of waters of the Jordan River met with strong resistance by Syria at the UN.¹³ In addition, Arab-Israeli hostility resulted in numerous small scale military actions in the 1950s that mutually targeted various water projects of the neighboring but hostile states.¹⁴

The U.S. Administration of President Dwight Eisenhower undertook both political and technical assistance initiatives in the 1950s in order to ensure peace and stability in the region, and to achieve some resolution of outstanding water resource issues. Special U.S. Ambassador Eric Johnston created a comprehensive water resource allocation plan for the

region. Although Johnston's activities were halted because of the 1956 Suez crisis, the resulting plan became a de facto agreement with which the regional Arab states largely complied. The Arab states with interests in the water resources of the Jordan River Basin still refer to the Johnston Plan allocations today. Despite the Johnston water resource allocations, as of 1984 Israel utilized 55 percent of the Jordan River Basin water resources – a level far above the allocations contemplated in the Johnston Plan – with the remainder 45 percent used jointly by Jordan, Lebanon and Syria.¹⁵

The June 1967 "Six-Day" Middle East War and its aftermath is felt even today as the international community still tries to devise a permanent solution to the ongoing Middle East crisis that would end the Israeli military occupation of the West Bank. The Israeli military victory in the 1967 conflict not only changed the map of the Middle East, but it also expanded Israel's direct control over water resources in the Jordan River Basin, in the Golan Heights, and in the aquifers of the occupied West Bank.

The Israeli occupation of Arab territories after the 1967 conflict increased both the level and the underlying causes of hostility between Arabs and Israelis in the region. Although the underlying causes of hostility rested primarily with the territorial expansion of Israel and its military occupation of Arab lands, the water resource issues increased the level of hostility since they added disputes and hardship to events of ordinary everyday life. For example, the influx of Israeli settlers into the West Bank brought about an increased demand for water resources in that region. Israel enacted certain regulatory measures in the occupied West Bank that were designed to limit Palestinian water consumption from the aquifers, e.g., issuance of permits to drill new wells that would draw water from the aquifers. However, Israel increased its draw of West Bank aquifer water without any hindrance. The consequence of these policies was that the available per capita water consumption for the Palestinians decreased in the occupied West Bank as their population continued to increase.¹⁶ Consequently, the average per capita water consumption of the Israelis in the settlements of the occupied West Bank in the 1980s was seven times the corresponding figure for the Palestinians.¹⁷ Correspondingly, following the 1967 War Jordan faced similar water resource problems since it had to absorb a large number of Palestinian refugees that fled the Israeli military occupation of the West Bank. Israel's occupation of territory and acquisition of control over additional water resources following the 1967 conflict enabled Israel's economic growth and the absorption of additional levels of immigration. The process of peace that took hold in the region in the 1990s "strongly suggests Israel will now have to share that water it once conquered," and "Israel has no means to acquire new water to replace what it gives up in the peace process."¹⁸

The Jordanian-Israeli Peace Treaty of October 1994 addressed in great detail water resource allocations between the two countries involving the Jordan and Yarmuk Rivers. Under the Treaty, Jordan is able to use Lake Tiberias in Israeli territory for the interim storage of water that is released to Jordan in summertime. Similarly, Jordan receives desalinated water from saline springs located below Lake Tiberias. Most importantly, Jordan assured Israeli *technical assistance and cooperation* for the exploration, acquisition, development, and management of *additional* water resources within Jordan.

Palestinian water rights in the region were formally recognized by Israel with the September 28, 1995 Interim Agreement on the West Bank and the Gaza Strip (otherwise known as the “Oslo II” or “Taba Agreement”). This Agreement included the Israeli recognition of Palestinian water rights in the West Bank, provided additional water resources for consumption by the Palestinian population in the West Bank and Gaza Strip, and set up a Joint Water Committee that would deal with coordination issues for water and wastewater management in the West Bank. Although the Palestinians were provided with additional water resources for consumption in the West Bank and Gaza, it was estimated that overall water consumption per capita for the Palestinian population would still be at 89 m³ per year, or 23.84% of the corresponding 365 m³ figure for the Israeli population.¹⁹ Beyond this disparity, the basis of armed conflict because of water disputes in the region still exist. For example, in 2002 Israel threatened armed action against Lebanon for the latter’s increased use of water resources from the Hasbani River at a location very close to the Lebanese-Israeli frontier.²⁰ The Hasbani River contributes a significant water flow to the Upper Jordan River from which Israel draws its own water supplies.²¹ Nevertheless, the increased water supply drawn from the Hasbani by the Lebanese government is well within the Johnston regional water allocation plan.

The Nile is a truly transnational river. Egypt, Sudan, Ethiopia, Eritrea, Zaire, Uganda, Kenya, Tanzania, Rwanda, and Burundi participate in some fashion in the Nile River Basin. The Nile River has a length of 6,825 km and is the world’s longest river. The main source of the Nile River rests on the rainfall in the Ethiopian highlands (86%), while the rainfall that is accumulated in the lakes of the Sub-Saharan African countries (e.g., Lake Victoria), contributes 14% of the flow in the main body of the Nile.²²

The use of the Nile water resources for agricultural irrigation remained essentially unchanged from the times of the Pharaohs to the middle of the 19th Century when a number of barrages and canals first created “year round” agricultural irrigation capabilities in certain areas along the Nile. Dams and water reservoirs were also constructed so that water could be stored when the Nile flooded, and released during the January-July period when the normal level of the

main Nile River was low. In the 1940s, Egypt had adopted a plan for the construction of a series of upstream dams and associated reservoirs that would have ensured a constant flow of water in the main Nile even during time periods of the lowest rainfall. Only one dam in Uganda was built in accordance with this plan.

The military coup of 1952 that established Gamal Abdul Nasser as Egypt's leader not only fundamentally influenced political developments in the broader Middle East, but it literally influenced the course of the Nile itself. Nasser's Revolutionary Command Council opted for the construction of a single and immense High Dam on the Nile at Aswan, instead of the smaller dams contemplated under the earlier plan. Nasser's decision was largely based on political reasons. Egypt could exercise exclusive national control over the huge water storage capacity that would be created by the Aswan High Dam which would also provide hydroelectric energy generation in the order of 10 million MWh annually. Furthermore, the construction of the High Dam could be accomplished in half the time required for the series of the smaller dams in the 1940s plan. Finally, the Nasser regime viewed the High Dam as a symbol of national Egyptian prestige and modernization progress under the new revolutionary regime.²³ It should be noted that until June 1956, Egypt did not have full sovereignty over its national territory since British troops were still stationed in the Suez Canal zone. The Nasser regime was also imbued with strong anti-colonial sentiments and was becoming one of the principal actors in the emerging Third World movement.²⁴

The construction of the Aswan High Dam marked a watershed not only in the political and socioeconomic development of Egypt but also in the historic break in Egyptian-U.S. relations in 1956. Indeed, the financing of the High Dam construction can be characterized as a "missed opportunity" in Egyptian-U.S. relations. The U.S. and the West viewed with suspicion Egypt's increasing relationship with the Soviet Union and other Warsaw Pact countries. Indeed, Nasser had ordered a large quantity of arms from Czechoslovakia and the U.S.S.R. in 1955. Although this did not appear to directly affect the course of the Egyptian-U.S. financing negotiations for the construction of the High Dam, and a U.S. offer had been formulated to that extent, increased Arab and Egyptian anti-western rhetoric led to the withdrawal of this offer in July 1956.²⁵ Not only did Nasser turn immediately to the U.S.S.R. for financing and technical assistance for the construction of the High Dam, but also the nationalization of the Suez Canal and the subsequent crisis occurred shortly thereafter.

The Aswan High Dam was successful in considerably increasing the quantity of arable land in Egypt and literally "reclaiming the desert." However, the High Dam was unable to fulfill all of the Egyptian water resource and electric energy production expectations on a long-term

basis. Although the High Dam has provided Egypt with a great degree of control over the water flows in the main body of the Nile, there is no control of the water inflows into the High Dam's massive water reservoir of Lake Nasser. Naturally, this affects the abilities of the High Dam to provide water for agricultural irrigation and to generate hydroelectric power. Thus, although the High Dam was originally capable of providing half of Egypt's energy needs when it was first built, increasing energy demand and the diversification of Egypt's energy resources has cut the High Dam's contribution to one-fifth of the energy consumption of the Egyptian economy. The High Dam also produced certain undesirable long-term environmental effects. For example, the High Dam has prevented the propagation of the fertile silt that was usually deposited with the Nile floods and was instrumental both to agricultural and fisheries production on land and in the Mediterranean Sea respectively.²⁶

The apportionment of Nile River water resources between Egypt and the Sudan under a 1959 Agreement appears to have provided a vehicle that has prevented the development of major disputes between the two countries. Egypt has also at times provided technical assistance for water projects in the Sudan. The preoccupation of the opposing factions in the Sudanese Civil War has prevented any coherent focus on water management issues.

Ethiopia, which controls the source waters of the Blue Nile, has repeatedly asserted its rights to utilize these source waters in a manner that could affect the water inflows into the major body of the Nile. At times, these Ethiopian intentions triggered adverse Egyptian reactions about the possibility of reduced water inflows into the main body of the Nile. The Ethiopian intentions and the Egyptian reactions were often tied to Superpower politics during the Cold War. For example, when Nasser's regime established an economic and military relationship with the U.S.S.R., the Ethiopian monarchy under Haile Selassie was aligned with the West. By the time that the Egyptian government of Anwar Sadat had openly sided with the U.S., the Selassie monarchy had been overthrown in Ethiopia, and the Mengistu regime had established friendlier relations with the U.S.S.R. As late as 1991, Egyptian officials had alluded to the use of military means and "deterrence" for assuring the uninterrupted inflow of water into the main body of the Nile from Ethiopia.²⁷ However, the nations bordering the Nile are currently looking at the Egyptian water consumption patterns with suspicion. All of the nations bordering the Nile have high birth rates and their increasing populations are placing corresponding demands on available water resources both for personal consumption and economic development. Thus, although Egypt has initiated the transportation of Nile water to the Sinai desert through tunnels that pass under the Suez Canal, Ethiopia and its people continue to live in conditions of debilitating poverty and malnutrition.²⁸

SUMMARY SURVEY OF WATER RESOURCES

The dilemma between ever increasing populations and the scarcity of water resources has been previously addressed. Certain studies indicate that in a moderately developed country 1,000 m³ of water per person per year is an approximate minimum amount for an acceptable quality of life. In semi-arid countries with sophisticated water management policies such as in Israel, this level can decline to 500 m³ per person per year. The following table provides an illustration of the discrepancies in renewable water resources in cubic meters per capita in various countries in the Middle East.²⁹

Country/Year	1960	1990	2025
Israel	1,024	467	311
Jordan	529	224	91
Lebanon	2,000	1,407	809
Syria	1,196	439	161
Iraq	14,706	5,285	2,000
Turkey	N/A	3,520	N/A

TABLE 1

DOMESTIC AND TRANSNATIONAL WATER RESOURCE MANAGEMENT

One of the best examples that demonstrates the sociopolitical and economic significance of domestic and transnational water resource management concerns the Jordan River basin. Some of the political and socioeconomic parameters that govern the broader conflict in the region and the competing interests over the water resources of the Jordan River basin have been recounted already. These conflicts, however, have undermined and continue to degrade both the domestic and the transnational capabilities to effectively and efficiently manage existing water resources to the collective benefit of all the competing parties in the region.

There is no doubt that Israeli scientific and engineering applications for efficient water management and use in agriculture and industry provide examples that need to and can be emulated in the region. However, such Israeli innovations as the wide use of drip irrigation in agriculture entail certain capital investment costs that can easily be afforded by both the private

and governmental sectors of the Israeli economy that is generously subsidized by U.S. military and financial aid that exceeds \$2 billion annually. In sharp contrast, the prolonged conflict in the region has depressed the economies of neighboring Arab states, and has literally devastated the governmental and private economic resources of the Palestinian Authority. For example, the 2001-2003 Palestinian-Israeli conflict has led to the evaporation of significant tourist revenues both for the Palestinian and Israeli economies.

The lack of capital resources for the Palestinian users of the water resources in the Jordan River basin has led to their inefficient use. Often, Palestinian water projects and irrigation techniques fall far below modern standards. That leads to the waste of precious water resources. The civilian infrastructure in various segments of the Palestinian Authority is decrepit since it has evolved from the “temporary made permanent” Palestinian refugee camps in the West Bank and Gaza. The lack of concrete water and wastewater infrastructure investment projects in Palestinian areas is gradually polluting water aquifers in the region. Paradoxically, a permanent peace settlement of the Palestinian-Israeli conflict and the formal establishment of an internationally recognized Palestinian state will be a mixed blessing as far as water resource management is concerned. Although such a peace settlement will likely accelerate cooperative transnational regional arrangements for the management of the Jordan River water basin resources, the same resources may have to cope with the influx of as many as one million Palestinians that currently reside outside the region. Certain calculations indicate that the increased water demand will amount to 25,000,000 to 35,000,000 m³ annually and may outstrip the currently available water supplies.³⁰

Various solutions have been discussed for addressing the regional water supply problems of the Jordan River basin. Certain solutions depend on the foundations of existing strategic relationships. For example, Turkey has demonstrated its willingness to sell water supplies to Israel. Reportedly, Turkey and Israel have entered into an agreement under which Turkey will sell Israel 50,000,000 m³ of water annually for the next twenty years.³¹ It is uncertain if this solution will prove to be cost-effective and sustainable in view of the fact that Turkey and Israel are not contiguous states. Furthermore, importation of water from Turkey may not change the Israeli water consumption and exploitation patterns so that an overall surplus water supply benefit will be created for the neighboring Arab states and the Palestinian Authority.

In contrast, the evolving parameters of regional co-dependence and the “economic specialization of nations” may provide more realistic and durable solutions for the regional water supply issues in the Jordan River basin. Many of the countries that currently draw water supplies from the Jordan River basin insist on meeting their respective demands for food

through domestic production. This self-sufficiency in food production is perceived as a matter of national survival and security. This approach can lead to an inefficient use of water because although agriculture is occupying an ever decreasing share of certain national economies in the region, it consumes a disproportionate share of scarce and highly valuable water resources. It is also estimated that a ton of water that is consumed as an economic input to the agricultural sector of a national economy contributes only \$1,000 to its GNP. In contrast, the same amount of water input to the industrial sector of a national economy contributes \$14,000 to its GNP. Furthermore, governmental subsidization of the water supplies that are used for agricultural purposes in the region of the Jordan River basin distorts the true economic cost of these water supplies. Assuming that an environment of permanent peace and regional trade and economic cooperation was to be established among the countries of the Jordan River basin, it would be easy to see that certain countries such as Israel may have the economic incentive to import more food rather than domestically produce it. The resulting water resource utilization efficiencies can free up water supplies for domestic and industrial use of growing national populations in the region. Such an approach will be fiercely resisted by the respective domestic national agricultural lobbies that enjoy considerable political support and are the beneficiaries of governmentally subsidized water.³²

DOMESTIC POLICIES AND TRANSNATIONAL EFFECTS

The best example that demonstrates the transnational effects of domestic policies that affect water resources and their management is Turkey's GAP project (Güneydogu Anadolu Projesi – Southeast Anatolia Project) that affects the flows of the Tigris and Euphrates Rivers. As previously recounted, Turkey's motives to engage in the massive GAP project were primarily of a domestic political and socioeconomic nature. The primary intended beneficiaries of the GAP project are the region and the population of Southeastern Turkey. When the GAP project was envisioned and planned, this region was characterized both by six-month dry seasons and poor irrigation. Turkish government studies indicated that there could be substantial increases in irrigated land that could be combined with the provision of water supplies for urban areas, flood control, and the production of hydroelectric power. The GAP project has enabled Turkish farmers to engage in crop rotation (something that is impossible without irrigation), thus substantially increasing the yields of regional agricultural production.³³

During the 1970s, Turkey was faced with increased energy shortages. Demand for electric power outstripped the available supply with the result that rotating blackouts were instituted among industrial, commercial and residential consumers. In addition, Turkey's less

than desirable economic situation, and the high prices of imported oil, placed grave demands on Turkey's foreign currency reserves, with the result that fuel consumption for private, commercial and agricultural vehicles had to be rationed in 1979.³⁴ Naturally, Turkey was anxious to devise new means of increasing its native electric generating capacity and to reduce its dependence on imported oil. The GAP project with its dams is providing much needed hydroelectric power generating resources that are connected to the national transmission and distribution grid of the Turkish Electricity Authority (Türkiye Elektrik Kurumu – TEK). The GAP project has increased hydroelectric generation capacity to 45% of Turkey's national electric generation resources.³⁵ The current installed hydroelectric generating capacity of the GAP dams amounts to 7,476 MW. In 2001, the total energy produced in the GAP region reached approximately 11.5 million MWh. By 2001, the cumulative energy that was produced by various GAP project dams had reached 184 million MWh. Turkish sources emphasize that this hydroelectric power production was a substitute for an equivalent amount of 46 million tons of fuel oil or 35.5 billion cubic meters of natural gas. According to the same sources, the GAP energy production has reached 9.3% of the total energy production in Turkey from all sources (including thermal and renewable energy production).³⁶

The GAP reflects Turkey's historic vision for harnessing the water resources of the Tigris and Euphrates Rivers for the purposes of integrated and self-sustainable socioeconomic development that encompasses multiple segments of the Turkish economy such as agriculture, energy, industry and services. The scale of Turkey's GAP undertaking is immense with an estimated cost of \$32 billion. Most of the individual GAP projects have received foreign loan financing. Such foreign loans range from \$224 million from the World Bank and the European Investment Bank for the Karakaya Dam and Hep water project, to \$650,000 from the World Bank and the Australian Government for individual farm development projects.³⁷

The economic development of Southeastern Turkey was of crucial importance to a succession of Turkish governments that were engaged in a very costly counter-guerilla campaign against the domestic supporters of the Kurdish Workers Party (PKK). Economic development was seen as one of the essential factors that could undermine regional support of the PKK guerilla movement. By the mid-1990s, the annual cost of the Turkish military and domestic security forces campaign against the PKK guerillas had reached \$8 billion annually, and no less than three thousand villages in the region had been vacated by Turkish governmental authorities in order to deprive the PKK guerillas from any popular support among the ethnic Kurdish population inhabiting Southeastern Turkey. The total number of persons killed during that conflict reached 30,000.³⁸ By 1999, Turkey had attained a military victory over

the PKK, and had captured, tried and sentenced to death its leader Abdullah Öcalan. Interestingly, the Turkish military victory over the PKK was not achieved without first neutralizing the Syrian support that was provided to the PKK guerillas since the mid-1980s. In October 1998, Turkey threatened Syria with military action if its support to the PKK did not cease and if Syria continued to provide Öcalan and his followers with safe heaven. Due to its weakened economic and military state, Syria had no other alternative but to succumb to the Turkish political and military pressure. Syria closed down the PKK training camps within its territory but it did not obstruct PKK activities in the Syrian-controlled Bekaa Valley in Lebanon.³⁹ This provides an indication that the complex bilateral and multilateral relations that are prevalent in this region of the Middle East can often become obstacles to the resolution of issues of more global and dramatic significance, such as the ready availability of water resources that are essential for basic human survival.

During the prolonged conflict between the Turkish government and the PKK guerillas, Syria had perceived its support for the PKK guerilla movement as a means of political leverage that could counteract the control that Turkey exercises over the water flows of the Euphrates. An additional complexity that has been inserted in the Syrian-Turkish relations since the late-1980s is the formation of the U.S.-Israel-Turkey axis that fundamentally affects the regional security balance in the Middle East. Turkey is a NATO member and its foreign policy is closely aligned to that of the U.S. with respect to the survival and security of Israel. Turkey has utilized its military, political and economic cooperation with Israel in order to mobilize domestic U.S. political support for its policies.⁴⁰ Similarly, Turkey's alignment with the U.S. containment policies in the Middle East and its military cooperation with Israel are viewed as parameters of Turkish national security policies vis-à-vis Syria, Iraq, and Iran that border Turkey.

Turkey's alignment with the U.S. and Israel naturally affects Turkey's relationship with its Arab neighbors. Thus, Turkey's bilateral relations with Syria, even after the "resolution" of the conflict with the PKK guerilla movement, are subsumed in the broader conflict parameters that exist between Syria and Israel. Indeed, Syria has politically linked the issue of its rights and interests in the water flows of the Euphrates to an overall settlement of the Middle East conflict that encompasses the Syrian-Israeli dispute (e.g., control of the Israeli-occupied Golan Heights). Syria has constructed this multilateral linkage since it is one of the few means available for exerting political pressure on Turkey. Naturally, Turkey has resisted any attempts to include its national territorial control over the Tigris and Euphrates as part of wider regional negotiations that are designed to bring about a comprehensive settlement of outstanding Middle East issues and conflicts.⁴¹ In view of the strategic relationship that Turkey currently enjoys with the U.S.

and Israel, and the Turkish role in U.S. containment policies in the Middle East vis-à-vis Iraq and Iran, it is highly unlikely that the Syrian foreign policy goals will be realized any time soon.

Turkey's alignment with the U.S. and Israel also affects its relationship with Iraq. The two countries had a commonality of interests with respect to the Kurdish ethnic populations in their respective territories. Iraq had violently suppressed its own Kurdish ethnic population since the late-1950s. Armed Kurdish resistance to the central regime in Baghdad continued through the 1960s and 1970s. The Kurds of Iraq received assistance from both the Iranian regime of Reza Pahlevi and Israel. The 1975 Algiers agreement between Iraq and Iran stopped Iranian support for the Kurdish movement in Iraq.⁴² In the 1980s, Iraq permitted Turkish troops to pursue PKK guerillas into Iraqi territory, and also permitted the Turkish Air Force (THK) to carry out air strikes against PKK hideouts in Iraqi territory. Iraq also continued to combat the low grade guerilla activity by Iraqi Kurds in the 1980s. At the conclusion of the Iraq-Iran war in 1988 the Iraqi regime of Saddam Hussein launched a military campaign against the Iraqi Kurds in Northern Iraq and utilized chemical weapons against the Kurdish population at Halabjah with murderous results among defenseless civilians.⁴³

Turkey was not an active participant in the 1990-1991 Gulf War although the Coalition forces were able to utilize Turkish air bases for the air campaign against Iraq. The Turkish participation in the Coalition's campaign against Iraq was undertaken despite the subsequent economic losses that Turkey realized from a substantial loss of trade with Iraq. Furthermore, internal disagreements among the Turkish leadership ensued over the extent of Turkish involvement in the crisis.⁴⁴ The extent of the Turkish involvement in the Gulf War crisis of 1990-1991, however, did not include the use of the "water weapon" against Iraq. As early as January 1991, Turkish President Turgut Ozal declared that water would not be used as a weapon. This decision was based both on political and technical reasons. Turkey had traditionally abstained from assuming a direct role in Middle East disputes. At that time, many of the GAP dams on the Tigris River were still in the construction stage, thus, Iraq still had the requisite availability of water supplies. Furthermore, even if Turkey wanted to block the water flow in the Euphrates River, such action would have negatively affected the water resources available to Syria which was one of the Coalition partners.⁴⁵

Following the Iraqi defeat in the Gulf War of 1990-1991, and the influx of Iraqi Kurdish refugees into Turkey, Turkish governments and the Saddam Hussein regime tacitly cooperated in opposing regional Kurdish aspirations for autonomy. For example, Baghdad did not resist or raised tepid objections to the presence of Turkish troops raiding PKK bases in Iraqi territory in

the 1990s. On the other hand, the Turkish governments did not police the overland illicit trade in oil originating in Iraq that clearly violated applicable UN sanctions.⁴⁶

The Iraqi crisis of 2002-2003, and the advent of Coalition military operations against the Iraqi regime of Saddam Hussein in March 2003, is redefining Turkey's strategic priorities and goals in the region. The U.S.-led military initiatives to effectuate a regime change in Baghdad and destroy Iraq's arsenal of weapons of mass destruction (WMDs) are widely opposed among the Turkish population at large.⁴⁷ Despite U.S. promises of a generous economic assistance package and the assurances that Turkey would play a concrete role in a post-Saddam Iraq, the Turkish government was unsuccessful in obtaining the approval of the Turkish Parliament so that the U.S. could conduct wide scale military ground and air operations against Iraq from and through Turkish territory.⁴⁸ Perhaps in response, current U.S. plans seem unable to accommodate Turkish geopolitical goals and actions that seek to prevent the creation of an independent Kurdish state (or an autonomous Kurdish region) in post-Saddam Northern Iraq. At the time of this writing, the U.S. Administration of President George W. Bush is forestalling the entry of Turkish troops into Northern Iraq. This U.S. policy seeks to prevent a Kurdish-Turkish armed conflict while the Coalition is in the process of effectuating the regime change in Baghdad and stabilizing Iraq.⁴⁹

The fundamental differences that exist between Iraq, Syria and Turkey over the water resources of the Tigris and Euphrates rivers rest on the legal perspectives that these nations respectively hold. Turkey considers its exploitation of the Tigris and Euphrates water resources *within* its territory as a matter of *sovereign right*. The downstream nation-states of Iraq and Syria hold the Tigris and Euphrates to be *international* rivers and adhere to international law principles that support the *common* use of the water resources of these rivers. For example, Syria is a signatory to the May 1997 UN convention that addresses the "non-navigational uses of international watercourses." However, neither Iraq nor Turkey are signatories to this UN convention and Turkey objects to the convention's article 7, which states that all countries "have an obligation not to cause significant harm" to the relevant "international watercourses."⁵⁰

The strategic threat of Turkey's "water weapon" that is perceived by both Iraq and Syria is multidimensional. Both Iraq and Syria feel that the GAP dams and water reservoirs provide Turkey with the technical capability to deprive its neighbors from water resources that are crucial for human consumption, agricultural use, and hydroelectric power production. Iraq, Syria and Turkey have relatively high population growth rates that naturally place high demand levels on domestic and international watercourses. For example, the Syrian population growth is 3.8% per year.⁵¹ Under existing water use patterns, Turkey annually utilizes 16 billion m³ from the

32.5 billion m³ of the Euphrates water flow, and under a 1987 commitment, Turkey permits the remaining 15.5 billion m³ to flow into Syria. In turn, under an April 1990 agreement, Syria passes along 58% of this flow, or approximately 9.3 billion m³ into Iraq.⁵² Similarly, assuming an annual water flow of 19.7 billion m³ from the Tigris river and Turkey's use of 5 billion m³, the Tigris provides Iraq and Syria with 14.7 billion m³ of water flow. Iraq primarily uses the Tigris water flow which, along with the water flow of tributary rivers that join Tigris within Iraqi territory, provides Iraq with 29.5 billion m³ annually. Furthermore, Iraq is capable of cross-transferring large water volumes from the Tigris to the Euphrates via Lake Tharthar. These transnational water flow and consumption patterns are considered sufficient and may not present any actual strategic threat issues for the time being. However, changes in the Turkish upstream water consumption patterns and/or purely environmentally induced changes in the flow volumes can affect the downstream water availability of the Tigris and Euphrates for both Iraq and Syria. This can negatively affect Syria's plans to increase its hydroelectric power production capacity or even reduce the presently existing level. Similarly, these factors can definitely affect Syrian and Iraqi plans for increasing irrigated areas for agricultural use and self-sufficiency in food production.⁵³

Another strategic threat that is perceived by both Iraq and Syria is based on the transnational effects of environmental pollution on water quality. Both countries fear that the water quality of the Tigris and Euphrates will deteriorate prior to reaching their respective territories from the use of Turkish agricultural chemicals and industrial effluent discharges.⁵⁴ The passage of the Tigris and Euphrates water flows through aquifers provides only limited cleansing action for accumulated pollutants. Similarly, the prevention of harmful effluent discharges into the Tigris and Euphrates from industrial plants and residential areas requires the installation and operation of expensive pollution control equipment. Although it is not generally anticipated that the GAP region in Turkey will attract industries that will generate great amounts of industrial pollution, it can hardly be expected that the capital investment for environmental pollution control equipment is the first priority for an economically underdeveloped region.

The GAP project is also producing domestic sociopolitical effects that can have transnational effects. The construction of the GAP dams and water reservoirs have resulted in the displacement and resettlement of ethnic Kurds and their villages in Southeastern Turkey. By 1990, more than 210,000 residents had been displaced from areas that were later flooded by the Ataturk, Karkaya and Keban dam and water reservoir projects.⁵⁵ The implementation of Turkish resettlement policies because of the GAP projects coincided with the often forcible evacuation and resettlement of ethnic Kurdish villages and their populations in the context of the

Turkish anti-guerilla campaign against the PKK in the 1990s. These resettlement policies were less than ideal and led to poverty and overcrowding in urban centers in Southeastern Turkey, and created patterns of illegal migration and human trafficking into, preferably, European Union (EU) countries that persist to this day. The GAP projects have not been implemented without an accompanying social and cultural cost, including the submergence under reservoir water of various archaeological treasures that could not be rescued in time and channeled to regional Turkish museums.

The economic benefits from the implementation of the GAP are dependent on a variety of regional social and cultural factors. For example, Turkish farmers were initially unfamiliar with how to cultivate their lands with the newly found abundance of water that the GAP projects provided since they were accustomed to cultivate crops appropriate for drought conditions. Instead of opting for crop diversity, these farmers collectively preferred to cultivate cotton because of existing price subsidies. The end result was a depression in cotton market prices. Abundance of water has also led farmers to utilize this precious resource more than is needed by diverting it into their fields from open irrigation canals. This has led to increased soil salinization that can negatively affect farmland fertility.⁵⁶

There are conflicting views on how effectively Turkey can utilize the GAP projects as a strategic “water weapon” against Iraq and Syria. Theoretically, Turkey can simultaneously deprive both Syria and Iraq of water from the Euphrates River, assuming that the Turkish dam reservoirs had sufficient capacity to accomplish this goal. However, although Turkey can affect the flow of the Euphrates, the same cannot be said for the Tigris River because approximately half of the Tigris water flow is generated within Iraq itself.⁵⁷ Withholding the flow of the Tigris and the Euphrates would have negative political and economic ramifications for Turkey. Such action would invite international condemnation since it would adversely affect the basic human needs of civilian populations. Furthermore, the reduction of the water flow in the Tigris and Euphrates would reduce Turkey’s own hydroelectric power and energy generation which would have the unwanted effects of increasing Turkey’s own dependency on imported energy supplies, meaning increased demand for imported oil from the Arab countries, and imported natural gas supplies from Iran and the Russian Federation.⁵⁸

Turkey’s ability to control the flows of the Tigris and the Euphrates poses more of a long-term strategic threat in the overall context of regional political, military and economic dominance. Turkey already enjoys a position of superior military strength vis-à-vis *both* Syria and Iraq. Turkey’s economy despite its current crisis has a far greater potential than the economy of Syria which is stymied by outdated “central planning” structural deficiencies.

Similarly, the economy of Iraq, despite its oil wealth, will need a long time to recover from the 2003 crisis, assuming that a relative degree of political and social stability will prevail in a post-Saddam Iraq. The GAP projects will undoubtedly increase Turkey's economic development and prosperity. However, this increased level of economic development can also lead to corresponding increases in the Turkish demand and consumption levels of the Tigris and Euphrates water supply resources. Any consequent reduction in the water flows of the two rivers to neighboring Syria and Iraq will undoubtedly retard their respective long-term economic development potential and will worsen their already weakened regional strategic positions. In summary, regional strategic relationships and the potential for conflict will be affected in the long-term by Turkey's unwavering commitment to the GAP project.

Turkey's motives for using the GAP project as a strategic "water weapon" will also be influenced by the post-Saddam structure of Iraq itself. Turkey's perceptions of the "Kurdish threat," if the Kurds of Northern Iraq were to gain an increased degree of autonomy in a federal governmental structure in a post-Saddam Iraq, will pose certain dilemmas to the Turkish political and military leadership.⁵⁹ Regional cooperative water management arrangements of the Tigris and Euphrates water flows can ensure long-term economic development patterns and political stability for all countries concerned, even if Turkey was to sacrifice an increment of its own economic development to the benefit of the Syrian and Iraqi economies. The "easy choice" of keeping the Syrian and Iraqi economies and societies (including the economy and the society of the Kurdish region in Northern Iraq) in a "weakened" state, will engender continuous instability and the threat of transnational armed conflict at Turkey's borders.

NATURAL RESOURCES IN THE MIDDLE EAST – CAN THE WATER AND THE OIL BE "MIXED"?

The perception that water is a "cost-free commodity" that cannot be "bought" or "sold" is widely held in the Middle East because of religious, social, and/or cultural reasons. For example, the Islamic religion and relevant law advances this view since water is an essential element for basic human survival. The lack of social acceptance that the *available* supply of *clean* water is an "economic good" with attendant economic costs may often lead to socially acceptable but economically detrimental policies. This paper has already addressed the issue that governmentally-subsidized water that is made available for agricultural use in countries that depend on the water supplies of the Jordan River basin may be accomplishing acceptable political and social goals albeit through the use of "skewed economics," i.e., the "price" of the subsidized water does not reflect the true "economic cost" of its relative scarcity, or the "opportunity cost" of its potentially more efficient alternative use.

Various scenarios have contemplated the construction of water pipelines from states with an abundance of water in the Middle East (e.g., Turkey), to countries with a scarcity of this precious resource.⁶⁰ These contemplated projects are both hugely expensive and politically risky. For example, the contemplated “Peace Pipeline” would originate in Eastern Turkey, with one arm traversing Syria and ending in Jordan and Israel, while the other would end in Kuwait and the Eastern Province of Saudi Arabia. Even with a permanent peace among the various antagonists in the Middle East, politically this is a highly sensitive project, and the price of the delivered water may well be unaffordable.⁶¹

The implementation of a more complex scheme of barter exchanges that involve water and oil, where the true economic value of water is high because of its relative scarcity, may be more efficient if these exchanges are coupled with appropriate changes in national resource allocation policies. Although this proposal again must rely on a political peace settlement in the Middle East, it may be more economically efficient since it may also encourage trade relations between nation-states that are currently hostile to each other. The oil-rich nations of the Middle East already use their precious export commodity for importing food as well as for producing energy that is in turn used for running their water desalination plants. Under a comprehensive peace settlement, some of these oil resources can also be used to alleviate water shortages elsewhere in the Middle East. For example, if Israel was assured of economically priced and sustainable oil imports (which currently arrive from Egypt and from as far away as Mexico),⁶² it may have better incentives to adopt the national economic policies that may free scarce water supplies from the Jordan River basin that can then be used by a newly independent Palestinian state. Similarly, if a reconstructed Iraq were to rethink its own policies of self-sufficiency in food production by relying more on food imports, its oil exports to Turkey can easily be used for that purpose. Correspondingly, more efficient use of water in Turkish GAP project agriculture not only can accomplish the goal of increased transnational food exports to neighboring Iraq, but it can also free much needed water supply resources for the sustainable economic development of Syria. From a social, cultural and religious viewpoint, such direct or indirect exchanges of “oil for water” can preserve the popular perception that water is still a “cost free commodity.” Such an “oil for water” exchange may not fully address the legal rights of the riparian states in transnational waterways that may be applicable under international law.

POTENTIAL SCENARIOS OF CONFLICT INVOLVING WATER RESOURCES

The potential armed conflict scenarios that would involve water resources in the Middle East are likely to be confined within the parameters of asymmetric warfare. The low intensity

warfare that existed between Israel and Syria in the 1950s and the 1960s prior to the June 1967 Six-Day War provides an example of armed conflict that can ensue between states with competing interests in transnational water resources in the Middle East. This type of low intensity warfare included frequent Israeli Defense Force (IDF) attacks in 1964 against the Syrian water diverting facility that was built after Israel had commenced its own diversion of Jordan River waters from their originating points at the Golan Heights.⁶³ This Israeli offensive included an air attack by the Israeli Air Force in 1966.⁶⁴ Since there were outstanding issues regarding the demarcation of the pre-1967 Syrian-Israeli frontier (Israel insisted on cultivating a no-man's zone), Syria would respond by attacking the beneficiaries of the Israeli irrigation schemes, (e.g., by mining areas adjacent to the border that Israel was trying to cultivate, occasionally shelling the Israeli agricultural settlements in the areas below the Golan Heights, or aiding cross-border raids by Palestinian guerillas).

Military actions that may be undertaken in the context of a transnational water dispute are likely to be limited to the same form of asymmetric low intensity warfare that will seek to assist the political and negotiating positions of one or more parties to this dispute. In this regard, this type of asymmetric warfare is likely to be confined to carefully planned sabotage actions or raids that can be rapidly carried out by the special forces and intelligence agencies of a nation-state, or by a proxy group. These actions will seek to "forcefully convey" one or more "messages" rather than cause significant and irreparable damage to an expensive water project of the adversary party to the dispute. These types of military actions are relatively easy to carry out, they incur a lower risk of conflict escalation, and are designed to minimize the risk of loss to human life and property. For example, temporarily disabling the transformer complex at a loosely guarded hydroelectric power generating facility, or causing damage to a stand-alone water pumping station, are relatively low-risk covert military and intelligence actions that can convey or reinforce a political message for a negotiated compromise in a transnational water resource dispute.

In contrast, the overt use of certain military systems will almost certainly guarantee the escalation of the underlying conflict and can cause significant damage, including the loss of life. For example, the historically famous May 1943 "Dam Buster" raid of the Royal Air Force (RAF) during WW II was able to breach a number of dams on the Ruhr River in Germany. Although this mission was a success for the RAF Bomber Command, it had negligible effects overall on the war materiel production capacity of Nazi Germany.⁶⁵ Similarly, a large-scale military operation that will be undertaken in the context of a transnational water dispute seeking to effectuate the destruction of a significant water project is likely to have unacceptable political

and economic consequences, and carries high risks of conflict escalation. The outright destruction of projects such as large dams is not an easy task. For example, the Ataturk rock-filled dam that is the centerpiece of the GAP project in Southeastern Turkey is the eighth largest of its kind in the world and has been designed to withstand earthquakes in the 8+ range of the Richter scale.⁶⁶ An overt military attack that will be designed to substantially damage or destroy a project of such a scale will be automatically considered a cause of war by the nation-state that built this project in the first place.

Significant damage or outright destruction of such projects through overt military action not only engenders the risk of significant casualties, but also holds the potential of ecological destruction due to flooding, loss of farmland, etc. Furthermore, the destruction of such high value projects may also have unintended consequences both for the aggressor as well as for other nation-states that may not be parties to the transnational water dispute but share in the water that passes through the potentially targeted project. For example, a disinterested “third party” nation-state may face the total loss of imported hydroelectric energy from such a water project if it were to be significantly damaged or destroyed as a result of direct military action. Indeed, it is no coincidence that Coalition air operations in the 1990-1991 Gulf War and during the 2003 campaign in Iraq did not target Iraqi dams and hydroelectric power generating stations. Finally, an overt attack that may have targeted such a large project for destruction may trigger the reaction of transnational alliances or coalitions. If Turkey were to suffer an overt state-sponsored attack against any of its GAP water projects it could invoke the assistance of the NATO Alliance of which it is a member.⁶⁷

CONCLUSIONS

The current and potentially future conflicts over scarce water resources in the Middle East are often enmeshed in the wider transnational political and socioeconomic antagonisms that exist in the region. The achievement of permanent peace settlements in conflict areas in the Middle East will certainly provide regional cooperative arrangements in resolving competing claims to scarce water resources in the face of increasing demand because of regional population growth. However, these cooperative arrangements must be founded on concrete guidelines of applicable international law and on policies that take into account inescapable principles of fundamental economics. This is not an easy undertaking in view of the fact that international law can apply conflicting principles for the use and allocation of water resources in transnational rivers.

The concept of absolute national sovereignty clearly favors the nation-state where such rivers originate, e.g., Turkey and the Tigris and Euphrates, Ethiopia and the Nile. In contrast, the legal principle of absolute integrity provides for the more equitable sharing of water resources among all riparian states in such waterways.⁶⁸ It is encouraging that the United Nations through UNESCO's new Water Cooperation Facility is undertaking a concrete initiative to address conflicts over the water allocation and use of transnational rivers. UNESCO's Water Facility which will be headquartered in Paris, France, was recently inaugurated in the Third World Water Forum in Kyoto, Japan. UNESCO's Water Facility will provide a useful body for the comprehensive study and mediation of water conflicts among river basin countries.⁶⁹ In this respect, UNESCO's Water Facility can be of great assistance to the solution of the competing water claims in the river basins of the Middle East. Considering that the work of U.S. Ambassador Eric Johnston in the water allocation plan of the Jordan River Basin in the 1950s is still applicable today, there is considerable hope that the Middle East water problems are not insoluble and do not need to be a source of continuous regional tension.

WORD COUNT = 9,618

ENDNOTES

¹ Rivers such as the Nile, Tigris and Euphrates, were traditional routes of commerce and communication for the ancient empires of Egypt, Persia and Rome. They also constituted traditional routes for military campaigns. Interestingly, the current Coalition military campaign against the Iraqi regime of Saddam Hussein had its starting point in Kuwait and has followed the reverse course of the Tigris and Euphrates Rivers towards Baghdad.

² Dr. Mahdi Shehatta ed., The Security Of Arab Waters (Beirut, Lebanon: Center for Euro-Arab Studies, Paris, France (in Arabic), Dar Bilal, June 2000), back cover.

³ Director of Central Intelligence Agency, National Intelligence Council, Global Trends 2015: A Dialogue About the Future With Nongovernmental Experts, NIC 2000-02, (Washington, D.C.: Central Intelligence Agency, December 2000), 27-28 (referenced as "CIA Global Trends 2015" – emphasis added).

⁴ Wolfango Piccoli, "Turkish-Israeli Military Agreements: Implications for Regional Security in the Gulf," in Oil and Water: Cooperative Security in the Persian Gulf, Bjørn Møller ed. (New York, NY: I.B. Tauris Publishers, 2001) 160-178.

⁵ Greg Shapland, Rivers of Discord: International Water Disputes in the Middle East, (New York, NY: St. Martin's Press, 1997), 115-118.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid., 111-113.

⁹ The Economist: A Survey of Turkey, "So where is Kurdistan," London, UK, 10 June 2000, 11.

¹⁰ Shapland, 111-113. Considering the dramatic devaluation of the Turkish lira against the U.S. dollar and the Euro since the February 2001 Turkish economic crisis, one can easily realize the additional economic burden that the Turkish economy must withstand in order to satisfy its needs in imported oil which is usually payable in U.S. currency.

¹¹ Ibid., 123.

¹² Ibid., 8.

¹³ Ibid, 14.

¹⁴ Stephen D. Kiser, Water: The Hydraulic Parameter of Conflict in the Middle East and North Africa, USAF Institute for National Security Studies, INSS Occasional Paper 35, (Colorado Springs, Colorado: USAF Academy 2000), 5.

¹⁵ Ibid., 5-6.

¹⁶ Shapland, 20-23.

¹⁷ Kiser, 18.

¹⁸ *Ibid.*, 28.

¹⁹ Shapland, 32-34, & n. 77. The Agreement is a successor to the first Palestinian-Israeli "Oslo Agreement," and it was signed in the Egyptian resort of Taba at the Gulf of Aqaba.

²⁰ BBC News – Middle East, [Israel issues threat in water row](http://www.BBC.co.uk), <www.BBC.co.uk>, 16 October 2002; Internet accessed 16 October 2002.

²¹ Shapland, 40.

²² *Ibid.*, 57-60.

²³ *Ibid.*

²⁴ Sydney Nettleton Fisher, [The Middle East: A History](#), (New York, NY: Alfred A. Knopf, Inc., 1969), 710.

²⁵ *Ibid.*, 702-703 & 709-710.

²⁶ Shapland, 63-65.

²⁷ *Ibid.*, 77-80.

²⁸ Diane Raines Ward, [Water Wars: Drought, Flood, Folly, and the Politics of Thirst](#), (New York, NY: Riverhead Books 2002), 183, 185-186.

²⁹ Abu Zaid, Lt. Col., Kuwait Air Force, [Water Equals Peace. Will The Equation Hold For The Middle East?](#), Defence Research Paper (Shrivenheim, UK: Joint Services Command and Staff College, September 2000 – July 2001), 4.

³⁰ Kiser, 27.

³¹ David Chazan, [Turkey and Israel seal water deal](#), BBC News, London, UK, <www.BBC.co.uk> 6 August 2002; Internet accessed 6 August 2002. Certain Israelis have indicated their preference for more desalinated water rather than depending on imported water from Turkey.

³² *Ibid.*, 19-20.

³³ Federal Research Division, Library of Congress, Helen Chapin Metz ed., [Turkey: A Country Study](#), HQ Department of the Army, DA Pam 550-80, (Washington, D.C.: U.S. Government Printing Office 1996), 181-182.

³⁴ *Ibid.*, 197.

³⁵ *Ibid.*, 203.

³⁶ Republic of Turkey Prime Ministry Southeastern Anatolia Project Regional Development Administration, Ankara, Turkey, 2002, <www.gap.gov.tr>; Internet accessed 25 February 2003 (Turkish GAP Administration).

³⁷ Ibid.

³⁸ Mark S. Adams, Water and Security Policy: The Case of Turkey, National Defense University, Washington, DC, (undated), <<http://www.ndu.edu/nesa/docs/marksadams-water.pdf>>, 18; Internet accessed 28 February 2003.

³⁹ Ibid., 28.

⁴⁰ Piccoli, 166.

⁴¹ Adams, 29.

⁴² Federal Research Division, Library of Congress, Helen Chapin Metz ed., Iraq: A Country Study, HQ Department of the Army, DA Pam 550-31, 4th Ed., (Washington, DC: U.S. Government Printing Office 1990), 84-85 (Iraq Country Study).

⁴³ The Middle East, 9th ed., (Washington, DC: Congressional Quarterly Press 2000), 260.

⁴⁴ Adams, 50-51. It appears that Turkish President Ozal aspired for a more active Turkish military participation in the Gulf War of 1990-1991. His plans met with the disagreement of the Turkish General Staff. This disagreement resulted in the unprecedented resignation of General Torumtay, Chief of the Turkish General Staff. President Ozal's aspirations appeared to include a Turkish military drive for the occupation of Kirkuk and Mosul in the oil-producing region of N. Iraq.

⁴⁵ Ibid., 52-53.

⁴⁶ Douglas Frantz, "At Iraq's Backdoor, Turkey Flouts Sanctions," The New York Times, 30 March 2001, NE Ed., A1, A18; Hugh Pope, "Counting Costs: Flow of Aid Leaves Iraqi Kurds Wary Of Role as U.S. Ally," The Wall Street Journal, 12 February 2002, A1, A10.

⁴⁷ Keith B. Richburg, "Turks Remember Losses From Last War on Iraq: Opposition Rooted in Economic Devastation," The Washington Post, 23 February 2003, p. A28.

⁴⁸ Leyla Boulton, Judy Dempsey, David Gardner and Peter Spiegel, "The US cannot just talk the military, haggle – and sign the cheque," The Financial Times, 4 March 2003. The Turkish Parliament eventually approved the use of two air corridors for the conduct of U.S. air operations against Iraq. However, these operations could not be carried out from bases on Turkish soil, neither could U.S. combat aircraft be refueled at Turkish air bases en route to their targets in Iraq. CBSNews.com, Turks Will Allow Overflights, CBS Broadcasting, Inc., 21 March 2003, <www.cbs.com>; Internet accessed 21 March 2003; CNN.com./World, Turkey shift forces planes' U-turn, 21 March 2003, <www.cnn.com>; Internet accessed 21 March 2003.

⁴⁹ Frank Bruni, "Turkey Sends Army Troops Into Iraq, Report Says," The New York Times, 22 March 2003, B1, B3; Daniel Williams, "Kurds Ready Defenses For Arrival of Turks," The Washington Post, 4 March 2003, A18.

⁵⁰ Adams, 33-34.

⁵¹ Shapland, 125.

⁵² *Ibid.*, 125-127.

⁵³ *Ibid.*, 128-132.

⁵⁴ *Ibid.*, 132-134.

⁵⁵ Adams, 37-43.

⁵⁶ Martin Woker, Urfa: Waiting for the Blessings of Progress – Uncertain Impact of the Atatürk Dam in Southeastern Anatolia, Neue Zürcher Zeitung, 23 December 1999, <<http://www.n33.ch/english/background1999/background9912/lg991217turkey.html>>; Internet accessed 5 March 2003.

⁵⁷ Shapland, 135.

⁵⁸ *Ibid.*

⁵⁹ Turkey's stated justification for a potential military intervention in Northern Iraq during the 2003 Coalition operations against the Iraqi regime of Saddam Hussein includes the following reasons: (1) Kurdish occupation of the Kirkuk oilfields in Northern Iraq will provide the Kurdish movement with the necessary economic means to declare an independent Kurdish state. An independent Kurdish state will renew the separatist conflict in Southeastern Turkey among Turkey's Kurds who will seek union with an independent Kurdistan. This dismemberment of the Turkish Republic is unacceptable. (2) The Turkmen minority of Northern Iraq must be protected. The Kurdish parties in Northern Iraq have declared that they do not desire independence. Furthermore, Turkey has by treaty but not ideologically resigned from its geostrategic goal to exercise control over the oilfields of Kirkuk and Mosul in Northern Iraq which it considers to have "unjustly lost" following the end of WW I and the final dissolution of the Ottoman Turkish Empire. Nicole and Hugh Pope, Turkey Unveiled: A History of Modern Turkey, (Woodstock, New York: Overlook Press 1998), 226.

⁶⁰ The Security of Arab Waters, 240-241 (translated by Col. Ali AlQallaf).

⁶¹ Thomas R. Stauffer, Water and War in the Middle East: The Hydraulic Parameters of Conflict, Information Paper No. 5, (Washington, D.C.: The Center for Policy Analysis on Palestine, July 1996), 15.

⁶² Federal Research Division, Library of Congress, Helen Chapin Metz ed., Israel A Country Study, 3rd Ed., HQ Department of the Army, DA Pam 550-25, (Washington, DC: U.S. Government Printing Office 1990), 159 (Israel Country Study).

⁶³ Ibid., 159.

⁶⁴ Sydney Nettleton Fisher, 670.

⁶⁵ Max Hastings, Bomber Command, (The Dial Press, 1979), 260. The RAF "Dam Buster" raid necessitated the development and manufacture of special air dropped mines that were launched from Avro Lancaster bombers at low height. The mines were designed to bounce on the water in the direction of the dams and then sink close to their foundations where they detonated. The combined effects of the explosions and water pressure from the dam reservoirs breached the dams.

⁶⁶ Meredith W. B. Temple, Col. USA, The Southeast Anatolian Project and Middle East Water: Implications for NATO, Strategy Research Project, (Carlisle Barracks, Pennsylvania: U.S. Army War College, 1998), 8; Shapland, 143. The Ataturk dam in Turkey is heavily defended against air attacks.

⁶⁷ Temple, 18-20.

⁶⁸ Kiser, 20-21.

⁶⁹ Tim Hirsch, Agency will mediate in water disputes, BBC News, London, UK, 21 March 2003, <www.BBC.co.uk>; Internet accessed 21 March 2003.

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