

USAWC STRATEGY RESEARCH PROJECT

**WATER IN THE MIDDLE EAST: A CATALYST FOR CONFLICT OR FOUNDATION FOR
COOPERATION**

by

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The views expressed in this academic research paper are those of the author and do not necessarily reflect the official policy or position of the U.S. Government, the Department of Defense, or any of its agencies.

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ABSTRACT

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The competing demand for fresh water resources in the Middle East is commonly viewed as a source for future conflict. Articles in academic publications by Peter Gleick, Joyce Starr and Daniel Stoll highlight the potential for conflict over water. The colonial legacy and the subsequent self-determination of emerging nation states, disparities in wealth, culture, ethnicity, religion as well as geography contribute to the serial episode of internal and external violence. Add to these the increasing demand for water by a rapidly expanding population and it is easy to understand how this environmental issue could trigger conflict.

However, the fact that interstate conflict has not yet erupted over this issue is notable. Water, perhaps the most valuable of finite natural resources, presents the potential to serve as a catalyst for stability and multinational cooperation instead of conflict. While history demonstrates that access to water can be a contributing factor to conflict, it also shows it to be an issue on which understandings and agreements can be based. The role for developing such confidence building measures is ideally suited to the United States, which, with its economic and political power can, build a multinational solution to this regional water problem.

TABLE OF CONTENTS

ABSTRACT	III
WATER IN THE MIDDLE EAST: A CATALYST FOR CONFLICT OR FOUNDATION FOR COOPERATION.....	1
ENVIRONMENTAL SECURITY.....	1
WATER CONFLICT IN THE MIDDLE EAST	2
PRECEDENT FOR WATER RELATED CONFLICT.....	3
RESOURCE DISTRIBUTION.....	4
ISRAEL	5
THE WEST BANK.....	6
GAZA.....	7
THE KINGDOM OF JORDAN.....	7
POTENTIAL FOR PEACEFUL RESOLUTION.....	9
LAND AND WATER.....	9
ALTERNATE SOURCES OF WATER.....	10
DESALINATION.....	11
PIPELINE.....	11
TANKERS.....	13
MULTILATERAL SOLUTION.....	13
RECENT ISRAELI INITIATIVES.....	13
RECOMMENDATION:A ROLE FOR THE U.S.	14
ENDNOTES.....	17
BIBLIOGRAPHY	21

WATER IN THE MIDDLE EAST: A CATALYST FOR CONFLICT OR FOUNDATION FOR COOPERATION

This paper will examine the competition for the finite sources of fresh water in the Middle East, the potential for future conflict and the possibilities that may exist for the United States to prevent such a conflict and thereby better realize its national security interests of regional and world stability. The scope of this examination will be limited to the Kingdom of Jordan, Israel and the Occupied Territories and their relationship with the waters of the Jordan River basin and the adjacent aquifers.

“While freshwater resources are renewable, in practice they are often finite, unevenly distributed, and subject to national or regional control. In the future it is as conceivable that a country could go to war over access to water as over access to oil or cobalt.”¹ It is through this lens that environmental security establishes itself as a key consideration in shaping United States (U.S.) National Security Strategy and promoting U.S. national security issues.

ENVIRONMENTAL SECURITY

“Environmental security is a process whereby a solution to environmental problems contributes to National Security objectives”.² It encompasses the idea that cooperation among nations and regimes to solve environmental problems can help advance the goals of political stability, economical development and peace. In addition, “by addressing the environmental components of potential security ‘hot spots’, threats to international security can be prevented before they become a threat to political or economic stability or peace.”³

According to the National Security Strategy of 1998 “the dangerous depletion or contamination of natural endowments of some nation’s soil, forest, water, and air-will create potential threats to the peace and prosperity that are in our national interests as well as the interests of the affected nations.”⁴ While it can be argued that as the “moral leader” of the world the U.S. has a global duty and responsibility to address the world environment, it is also true that these environmental threats pose direct and indirect threats to the National Security interests of the United States. Environmental issues must therefore, occupy an equal seat alongside the panoply of more conventional issues that are dealt with by the United States’ National Security Strategy.

It is essential that the leaders who are charged with shaping and executing national strategy understand the role that key, non-renewable resources play in the prosperity, stability and even the survival of a nation. Protecting existing or effecting new access to critical key

resources has always been one of the driving forces behind diplomatic and military activities between collective groups.

In our modern industrial era the most pronounced form of this competition is that which revolves around securing access to non-renewable energy resources. Accordingly, since 1943 national security strategists have considered U.S. access to the energy rich regions of the world, particularly the Arabian Gulf oil reserves, as an interest vital to our nation's well being.

However, as evidenced by the U.S. commitment of military forces in the 1991 Gulf War, it is not only with those resources directly consumed by the United States that our security strategy is concerned. It is also with those resources, which, when denied to other nations, have the potential to destabilize the ordered global economy and ultimately therefore, that of the United States.

When examining those resources that affect world stability therefore, one should expand the scope of consideration beyond those related to energy alone and include all resources that might serve as catalysts for conflict and destabilization.

Whereas the most prominent resource struggle is currently focused on securing the acquisition of fossil fuels to produce energy, the fact is there are potentially other sources of energy that might serve as a viable substitute. Not only might the manner by which we currently consume energy be adapted to new resources, but new technologies could conceivably provide a substitute that could satisfy the demands of the growing industrial world in the future. The same is not true, however, in the case of water. It is the one resource that serves a demand for which there is no known or imaginable alternative.

WATER CONFLICT IN THE MIDDLE EAST

While the potential for conflict over the access to fresh water is present in numerous regions of the globe, it is in the Middle East that this situation has the greatest capacity to threaten U.S. interests. Conflict in the Middle East poses an indirect threat to the security interests of the U.S. regardless of its cause, as any resulting instability tends to spread beyond the borders of the region. This is primarily due to the potential for conflict there to deny international access to the largest known reservoirs of oil in the world. However, it is also attributable in part to this region being the home to the world's three largest monotheistic religions. It is this emotional factor that gives the potential for any conflict in the Middle East the ability to effect not only the economies of the energy dependent industrialized nations, but possibly more dangerously, to spread to those nations comprised of populations embracing one of the three major monotheistic religions. Therefore, it is logical that the issue of water

availability in the Middle East should be considered an important interest to the security of the United States.

PRECEDENT FOR WATER RELATED CONFLICT

How likely is it that water would be the cause of war in this region? Referring to Ethiopia's proposed construction of dams in the headwaters of the Blue Nile, Egypt's President Anwar Sadat said in 1978: "We depend upon the Nile 100 per cent in our life, so if anyone, at any moment, thinks to deprive us of our life we shall never hesitate go to war because it is a matter of life or death."⁵ In 1979, just after signing the peace treaty with Israel, President Sadat stated that, "the only matter that could take Egypt to war again is water."⁶ Butrous Butrous Ghali, the minister of foreign affairs of Egypt and Secretary General of the United Nations said in 1985, "The next war in our region will be over the waters of the Nile, not politics."⁷ "Even the late Jordanian monarch, King Hussein, usually considered one of the more moderate and restrained leaders in the Arab world, had expressed explicitly that he regarded water to be the most likely motivation for war on the part of his country."⁸

In addition to political rhetoric, which can of course always be subject to a variety of motives, there is an abundance of commentary from scholars familiar with the issue, which supports the idea of water being a potential catalyst for war in the Middle East.

J. Starr and D. Stoll, in their 1987 article, US Foreign Policy on Water Resources in the Middle East, state, "water – not oil- will be the dominant resource issue of the Middle East", and that "the region is poised at the precipice of another major natural resource crisis which could sunder already fragile ties among regional states and lead to unprecedented upheaval."⁹ T. Naff and R. Matson state in Water in the Middle East – Conflict or Cooperation?, "Water has sometimes been the pretext for violent action in the past; it could be a flash point again."¹⁰ Martin Sherman remarks in his comprehensive analysis of the water problem in the region and its potential for peaceful resolution (The Politics of Water in The Middle East, 1999), that the chances for a cooperative, lasting solution to this problem in the current framework of relationships is remote at best. He states, "The conclusion that seems to emerge from the . . . prevailing geopolitical realities in the Middle East is that credible and stable inter-state cooperation remains a remote and ephemeral possibility."¹¹

Historical precedence alone suggests that water does have the potential to spark interstate violence in the Middle East. While certainly not the core foundation for conflict between Israel and its Arab neighbors the competition for adequate supplies of water has without question served to add fuel to an already heated fire. Examining Israel and her

neighbors alone, water has played a role in interstate military operations in at least six separate occasions since 1948.

During the First Arab-Israeli War of 1948 Arab forces cut the water supply to Israeli controlled West Jerusalem. In 1951 the Kingdom of Jordan made public its plans to irrigate the Jordan Valley by taking water from the Yarmouk River. Israel responded by beginning to drain the Hulh swamps located between Israel and Syria, which resulted in Israeli-Syrian border skirmishes. In 1953 Israel began construction of its National Water Carrier pipeline in order to transfer water from the north, where the majority of its water resources exist, to the agricultural areas being established in the more arid southern part of the country, the Negev Desert. The pipeline was initially situated to withdraw water from the Jordan River Basin, north of the Sea of Galilee, but Syrian military actions along the border and international disapproval compelled Israel to move its intake to the Sea of Galilee.

In 1965 Syria attempted to divert the headwaters of the Jordan River to presumably preempt the effectiveness of Israel's National Water Carrier Pipeline. As a result weapons fire was exchanged between the two countries forcing Syria in July 1966 to halt the construction of its diversion project. In the 1967 Arab-Israeli War, Israel destroyed the Syrian diversion works on the Jordan River headwaters and in addition to seizing the West Bank from Jordan, seized and occupied the Golan Heights. The Golan Heights, often referred to by hydrologists as the 'Water Tower' of the Jordan River is the location of the headwaters of the Banias River. This river is a significant tributary to the Jordan River, providing annually about 121 million cubic meters of water, or about 20 percent of it's total flow, before it reaches the Sea of Galilee. In 1969, suspicious that Jordan was over diverting the waters of the Yarmouk River, Israel lead two raids that destroyed the newly built East Ghor Canal, (now renamed the King Abdullah Canal).

In the Fall of 2002, in the midst of the chaos and violence of the second Intifada, a dispute arose over perceived Lebanese efforts to divert water from the Wassani River, a minor tributary of the Hasbani River. The Hasbani River, like the Banias, feeds into the upper Jordan River and provides approximately another 20 percent of the Jordan River's water flow. The Prime Minister of Israel, Ariel Sharon, has suggested that such Lebanese efforts might mean war.¹²

RESOURCE DISTRIBUTION

The problem of water in the Middle East is not simply one of supply. It is also a problem of regional distribution and usage that is complicated by economic, environmental and political factors.¹³ There is no better example of this complication than that found in the Jordan River

Valley, its tributaries, and adjacent aquifers. Though small in comparison to the Nile, Tigris or Euphrates, (the average discharge rates in billions of cubic meters (bcm/yr) for the Tigris, Euphrates and the Nile in 1993 were 49.2, 31.8 and 83.6 respectively and the Jordan 1.6),¹⁴ the Jordan River Valley is in the most politically volatile and complex sub-region of the Middle East. Although, the waters of the Jordan River Basin affect Syria, south Lebanon, Jordan, Israel, the West Bank, Gaza and the Golan Heights, it is Israel, the Palestinians of the Occupied Territories and the Kingdom of Jordan that rely the most on its waters. Only about 5 percent of the total water demand of Lebanon and Syria is satisfied from the Jordan basin while, on the other hand, the upper Jordan proper supplies Israel (and the occupied West Bank), with about one-third of its total water consumption. The Kingdom of Jordan depends on the river for approximately 50 per cent of its water needs.

ISRAEL

Israel depends on two types of sources for its fresh water supplies. They are the renewable sources derived from the Jordan River basin, (which includes the Sea of Galilee, also known as Lake Tiberias or Lake Kennerac, and the Yarmouk River), and the non-renewable ground water aquifers; those beneath the West Bank (the Yarkon-Taninim aquifer), and the aquifer of the Mediterranean coastal plain. The non-renewable aquifers provide Israel with sixty per cent of its fresh water usage with the remaining forty percent being provided by the renewable water sources of the Jordan River basin.

The Jordan River basin includes the Jordan River and its four main tributaries and the Sea of Galilee. The four main tributaries that feed the River Jordan are: the Dan in Israel, which at 245 million cubic meters (mcm) per year provides close to 50 per cent of the discharge into the Jordan; the Hasbani River in Lebanon contribute 138 mcm per year; and the Banias in Syria which averages 121 mcm per year. These Tributaries all feed into the Jordan River north of the Sea of Galilee while the fourth and more important of the rivers, the Yarmouk, empties into the Jordan River approximately 10 kilometers south of Galilee. The Yarmouk, which serves also as the western north-south boundary between Jordan and Syria, provides on average of 450 mcm of water to the Jordan River annually.

Total average intake flow of the Jordan River is between 1200 and 1850 mcm per year, depending on rainfall. This is less than 2 percent of the Nile, 5 percent of the Euphrates, and slightly more than 3 percent of the Tigris River flow. Furthermore, this already limited amount of water is subject to extreme seasonal and annual fluctuation. In February the river may carry

almost 40 percent of its total flow, whereas in the summer and autumn, when water is most needed, it carries only 3 to 4 percent of its annual discharge.¹⁵

THE WEST BANK

Not only do the aquifers provide Israel with the majority of its fresh water needs, but they are also the primary source of water for the Palestinians in both Gaza and the West Bank. However, control of the water resides with Israel and is therefore, the cause for heated dispute between the Palestinians and Israel. After the 1967 Israeli occupation of the West Bank control over the water was taken away from the local communities by the Israeli Civil Administration, which despite its name, was run by the Israeli military. In 1982 water management on the West Bank was transferred to the Israeli national Water Company, Mekorot.

The Yarkon-Taninim aquifer, located in the western highlands of the West Bank, yields approximately 340 mcm per year, or about equivalent to that diverted by Israel's National Water Carrier pipeline from Lake Tiberias. Israeli consumers use ninety-four percent of this water from the Yarkon-Taninim aquifer with the remaining 6 percent used by the Palestinians amounting to only 24 mcm per year. The remainder of Palestinian water is provided by aquifers flowing north into the Bet Shean valley and from aquifers on the eastern rim of the West Bank, (24 mcm and 59 mcm respectively).¹⁶ Another 3 mcm of water is purchased by Palestinians from the Mekorot Ltd. Israel consumes 85 percent of the water produced by the Bet Shean, and while Israel proper does not access the water of the eastern rim aquifer, nearly two thirds of its annual yield (30 mcm), is used by Israeli settlements and military outposts.¹⁷

Competition for the ground water resources of the West Bank is decidedly one sided as Israel maintains control over water distribution and access. This control results in some usage disparities and produces acrimony between the Palestinians and the Israeli Civil Administration charged with controlling the water. 1990 statistics show that West Bank Palestinians consumed 119 cubic meters of water per capita while Israeli settlers used 354 cubic meters per capita, with corresponding populations at approximately 1 million and 100,000 respectively.¹⁸ Restrictions on well digging, (depth and permission to dig new wells), as well as unfair pricing techniques for the purchase of water from Mekorot Ltd. have historically fueled the perception of discrimination against Palestinians, (Israeli settlers paid .15-.23 New Israeli Shekels per cubic meter while Palestinians paid .70), and complicated the issue of equitable access to this West Bank ground water.

GAZA

The usage of ground water from the aquifer of the coastal plain (Crystal aquifer) is a more severe situation than that found in the West Bank. The sustainable depletion rate of the aquifer there is 60 to 65 mcm per year, but demand as of 1994 was 100-120 mcm per year.¹⁹ Water has been over pumped by 25 mcm per year, and projections for increased demand indicate that there will be a water deficit of about 140-190 mcm per year by the first decade of the 21st century. The gross over-pumping has allowed seawater to invade the aquifer (sea-water intrusion and salinisation at a rate of 15-20 milligram per liter/per year)²⁰, and has contaminated at least 20 per cent of former capacity. Although stringent conservation could restore some parts of the aquifer over time, much of it is deemed beyond restoration. With projected population growth in Gaza indicating no let-up from the traditional 3 to 3.6 percent increase, restoration of the aquifer is clearly only possible if another source of water is introduced.

THE KINGDOM OF JORDAN

The Kingdom of Jordan is much more seriously affected by inaccessibility to fresh water than is Israel. With only 8.6 percent of the country receiving more than 200 mcm of rainfall annually Jordan is one of the driest countries in the world.²¹ Its principal renewable water resources are the Jordan River, which it shares with Israel, and the Yarmouk River, which it shares with Syria. Likewise it shares its non-renewable ground water with Iraq, Syria and the Kingdom of Saudi Arabia. The annual renewable water supply is 850-900 mcm per year; 320 mcm of this is from surface water; 270 mcm are from renewable groundwater and 210mcm from non-renewable groundwater.²² The Kingdom's demands, however, are far outstripping the level of supply with the 1995 consumption rate being 1 billion cubic meters (bcm) and the 2000 consumption rate increasing to 1.12 bcm.²³ Though Jordan has one of the lowest per capita consumption rates of water it continues to extract from its non-renewable aquifers at a rate that exceeds replenishment and is therefore causing a decline in water tables.

Moreover, since 1983, Saudi Arabia has been withdrawing water from the Disi aquifer, which it shares with Jordan, at a rate exceeding 250 mcm per year in order to conduct agricultural irrigation in its North Western province of Tabuk. It is projected that pumping at this rate will irrevocably deplete the aquifer by the year 2017, otherwise, the Disi could sustain Jordan with 100-120 mcm per year of high-quality drinking water.²⁴

Any attempt to resolve the water crisis as it exists between the Occupied Territories, Israel and the Kingdom of Jordan should consider resource distribution, water usage, and particularly the issue of agricultural irrigation. It is estimated that globally, irrigation agriculture accounts for

some 73 percent of fresh water consumed.²⁵ Irrigation is an inefficient way to use fresh water. It is estimated that only 37 percent of water applied through irrigation is absorbed by the crops; the rest is lost through evaporation, seepage, or runoff. Runoff, in turn, typically is polluted with agricultural chemicals and salts; it is consequently of less economic value to others and may even pose health threats.²⁶ In Israel however, 75 percent of fresh water consumption is applied to irrigation, while in Jordan this figure is approximately 72 percent (1990 statistics). Yet, the importance of agriculture to national income generation is declining in all of the Middle East except for Turkey and the Sudan.²⁷ In Jordan agriculture plays a small role in national income generation and employment, contributing only 6.8 per cent to the gross national product (GNP) in 1988 and employing only 7.6 percent of the work force.²⁸

The same holds true in Israel where the farming industry (once the foundation of early Zionist philosophy), has been in decline since the 1960s. Agriculture accounts for only 7.6 percent of the GNP and 3-4 percent of total export earnings. The percentage of the labor force employed in the agricultural industry has declined to 5.3 percent of the total.²⁹

Devoting such a significant percentage of so valuable a resource to an industry that contributes minimally to the economies of these states is, when viewed objectively, an irrational and wasteful endeavor. Growing wheat in the deserts of Saudi Arabia or Jordan, when it can be purchased and shipped from the United States at a lower cost, can only be explained in the political context of the region. Food self-sufficiency is a nationalistic goal rather than one of economical logic for many of the Middle Eastern nations.

Dependency on foreign agricultural imports has been viewed as a strategic vulnerability that merits budgetary subsidization of the farming industry and influences the unwise prioritization of water distribution. Much of the water that is being consumed to create breadbaskets out of the desert is drawn from non-renewable sources. When these aquifers are depleted, they cannot be regenerated; this is the case with the Disi aquifer in southern Jordan and northern Saudi Arabia. In the case of the Crystal Aquifer of western Israel and Gaza, the excessive use of fresh water is actually contributing to salt water seepage and permanent destruction of the aquifer. This destruction will deny any potential for using this water source in the future.

Israel, mostly self-sufficient in foodstuffs except for some cereals, and already a pioneer in efficient irrigation techniques, has initiated reforms aimed at reducing the subsidization of their farming industry that are intended to lead to reductions in fresh water used by irrigation. Jordan and the Occupied Territories however, are lagging in this area. In the case of Jordan, while progress in introducing new efficient irrigation systems has actually increased since 2000, there

is a lack of sufficient funds required for such endeavors. (In addition to being one of the most arid countries in the world it is also one of the poorest). In the Occupied Territories funding is even more critical an issue than in the Kingdom of Jordan. However, even if the money were available it is likely that the level of reform needed to significantly reduce agricultural water usage is beyond the ability of the current political structure to effectively implement. In view of the other more critical issues at hand, water conservation is likely low on the list of priorities for action by the Palestinian National Authority.

POTENTIAL FOR PEACEFUL RESOLUTION

In 1995 Shimon Peres stated, "With water, you can make politics. With land, you can make wars".³⁰ While it is easy to view the growing demand for water in this volatile region as potential fuel for conflict it is just as possible to see it as a vehicle for the creation of cooperative agreements within the region. In light of the history of political conflict, volatility of the region and limitations produced by fresh water the fact remains that remarkably, a major conflict has not yet taken place solely over water. (Although, Israel did gain control of the water resources in the West Bank and the Golan Heights as a result of the Six Days War in 1967, this was a by-product of victory and not a pre-war objective. The focus of the Israeli military was clearly in the Sinai Peninsula and only diverted to Jordan and Syria when attacked by those two countries).³¹

As the origin and flow of water in this area ignores political boundaries so must any political solution regarding its distribution. From the common concern by all parties for this most vital of resources there could be created a regional accord that governs the shared use of water and that compels the mutual cooperation between the participants. Such a foundation if soundly constructed, could conceivably serve as a springboard for exploring solutions to the other more basic disagreements confronting the region. The creation of a regional water accord is an opportunity that is ideally suited for the United States to lead and one that if achieved, could facilitate the realization of several related interests deemed vital to U.S. national security.

LAND AND WATER

While the control and occupation of territory is the fundamental source for conflict between Israel and its neighbors many peripheral friction points have emerged from this issue of sovereignty over territory. It should not be a surprise that the issues of supply, access to and usage of water have become politicized. However, before any consideration can be given to the ceding of sovereignty over land to the Palestinian Authority or to Syria, key strategic issues for Israel in particular have yet to be adequately and comprehensively resolved.

Israel faces a critical vulnerability if it were to cede the West Bank and its Yarkon-Taninim aquifer to a sovereign Palestinian State. To do so would risk losing full access to the source of 60 percent of its current water supply. Likewise, returning the Golan Heights to Syria also implies losing control of 20 percent of the Jordan River headwaters, for the Banias River would return to Syrian control. However, an increasing number of Israelis, and especially the professional elites, today accept the view of water as a commodity, rather than a strategic resource. This change in attitude toward water can facilitate water negotiations as Israelis come to realize that relinquishing some water is not a life or death issue, but rather a financial one.³²

Any permanent solution to the problem though, is likely to require much more than an attempt at reapportioning the existing resources, primarily because the water resources are insufficient to address the future demands of population and economic growth. The situation in Gaza suggests a model for the entire region. Where population growth will outdistance the benefits of conservation policies, outside water must be introduced to resolve the growing crisis.

"In 2020 it is estimated that the overall demand for water in Israel will be 22,650 million cubic meters. Today, the use of the available natural water already reaches the maximum sustainable level of 1555 million cubic meters."³³ The existing renewable water resources in Israel can clearly not satisfy the larger demand in 2020. Not only do these forecasts make it clear to Israeli strategists that it is necessary to retain control of the West Bank and the Golan Heights water supplies, they also make apparent the need for finding additional sources of fresh water in the near future.

"New water" could not only serve future growth requirements, but also facilitate the progress for territorial and therefore, political resolutions. Ideally any new source that would be introduced, if of sufficient capacity, might not only meet the demands of future growth, but also liberate Israel from its dependence on the West Bank and Golan Heights water sources. Finding a water source of such size could conceivably remove one of the major objections to granting the Palestinians complete sovereignty over the West Bank as well as permit the return of the Golan Heights to Syria, and thus solve two key obstacles to a lasting peace agreement. The question becomes then, from where will the additional water originate?

ALTERNATE SOURCES OF WATER

There are at least three potentially viable alternatives for introducing additional water to the region. They are the desalination of seawater; the importation of fresh water via pipeline; and the shipment of fresh water by tanker. All three options are costly and pose security risks that reach beyond the borders of Israel.

DESALINATION

The Arabian Peninsula is already home to the world's highest concentration of desalination plants and as a result, has developed much of the industrial base and expertise needed to manufacture and operate these facilities. Production of desalinated water in the region is estimated to be in excess of 2.6 billion cubic meters per year and more construction is underway. As of 1992 there were twenty-three major plants in Saudi Arabia, eight in the United Arab Emirates, six in Kuwait, three in Bahrain, two each in Qatar and Oman and one in Yemen.³⁴ Past proposals for desalination plant construction in Israel have centered on plans to construct a sea water canal from the Mediterranean Sea to the Dead Sea. As the Dead Sea is below sea level, the flow of seawater inland would be exploited to produce hydroelectric energy in quantities capable of powering the energy intensive desalination plants. Three separate sites have been debated for the construction of major desalination plants in Israel. These plants could theoretically provide adequate water needs to Israel allowing it some independence from the West Bank aquifer and the Sea of Galilee. However, to accommodate the projected fresh water deficit in the year 2020 (approximately 395 mcm per year) "the government has to initiate the construction of a desalination plant with a capacity of fifty million cubic meters every two and a half years".

There are two significant problems associated with the construction and use of desalination plants. The first is security. Once a nation establishes desalination as a primary source of fresh water, those facilities immediately become strategic targets that are difficult to defend. The Iran Iraq War (1980-88) and the Gulf War (1990-91) demonstrated that desalination plants can easily be attacked and are seriously threatened by off-shore oil pollution.³⁵ "Desalination equipment will make a wonderful target for anybody with a missile. You can spend a billion dollars and seven years in construction and lose it overnight."³⁶

The second problem is the high cost of constructing and operating a desalination plant. In order to produce 500 mcm/year of fresh water, the facility construction cost is estimated to be approximately two billion dollars with the production cost per cubic meter of water at \$.64.

PIPELINE

Another option for introducing a new source of fresh water to the region is the so-called "Peace Pipeline" project first proposed in 1987 by the late Turkish President Turgut Ozal. Offered as a means of providing fresh water to the water starved countries of the Arabian Peninsula, the "Peace Pipeline" would access the waters of the Ceyhan and Seyhan Rivers in south eastern Turkey which otherwise empty mostly unused into the Mediterranean Sea. The

initial proposal was to construct two major pipelines that would deliver water to both the Mediterranean and Arabian Gulf coast countries. The eastern branch would access Kuwait, Bahrain, Saudi Arabia, Qatar, the United Arab Emirates and Oman. The western branch would deliver water to Syria, Jordan and to the Red Sea coast cities of Yanbu and Jeddah in Saudi Arabia. Although Israel was included in the first draft it was later dropped at the request of Syria. However, in 1995 Turkey and Israel began exploring a separate under-sea pipeline project that would deliver water solely to Israel. The deliverable water capacity of these two rivers is estimated to be 5.8 billion cubic meters a year, which easily exceeds the forecasted requirements in Israel and the Occupied Territories for the next 20 years. The initial construction cost for this project is estimated to be in the range of 9.5 to 22 billion dollars with a resulting cost per cubic meter of water likely to be \$.84 to \$1.07.³⁷

Cost, while high, is not the only stumbling block. Security again is a key concern for the “downstream” customers. The issue of being dependent on Turkey for fresh water presents to all potential customers of this pipeline a situation of being entirely too vulnerable to Turkish political power. This condition already exists in Syria and Iraq where Turkish control of the headwaters of the Tigris and Euphrates Rivers has created much friction between the three nations in recent years. The idea of paying for additional water while remaining in a downstream status has proven to be an unappealing prospect for most of the Arab countries.

There is also the ever-present requirement of securing the entire length of the line - a daunting task that would be militarily as well as diplomatically complex. The prospect of having one's water held hostage by terrorist or another power is an old one to this area and, therefore, probably a hard sell as a multi billion dollar investment.

However, if the pipeline connects several countries there is less risk that one country could be cut off without affecting the others in the network. In this sense, security is actually enhanced by making this a regional rather than a bilateral solution. Securing the pipeline would be in the mutual interest of all “downstream” nations and therefore, provide a requirement that is best met via a cooperative framework.

Another pipeline proposition that has been considered in the past is that of delivering water from the Nile to Gaza. A much more feasible construction task than the “Peace Pipeline”, the Nile Pipeline was intended to address not only the water needs of Gaza, but also provide some water for irrigation of the Negev in southern Israel. However, this proposal was apparently put to rest by President Hosni Mubarak in 1997 when he ruled out giving Egyptian water to anyone else.³⁸ Undoubtedly this position reflects the realization that the excess Nile

water discussed for this project could easily be unavailable in the future, as Egypt's own expanding population outpaces what the Nile can deliver.

TANKERS

A third proposal, originally suggested by a Canadian firm, involves the importation of fresh water in either ships or enormous sea going plastic containers called 'Medusas'. The initial investment required for this project would be about two hundred million dollars with a \$.75 cost per cubic meter of water delivered.³⁹ Total delivery capacity, though variable, was estimated to be about 250 mcm per year. Shipping water via container, however, carries with it the same dependence on an outside party, not to mention a certain sense of fragility to the supply line that the other proposals do not convey.

MULTILATERAL SOLUTION

While each of the proposals discussed above possess varying degrees of merit and risk depending on a number of transient factors it is only the "Peace Pipeline" that offers a truly regional solution to the problem. While the interdependence associated with this project might be assumed to create too much vulnerability, if turned to catch a different light, the interdependence might be seen as a stabilizing inter-reliance. To make such a shift in interpretation would require a level of trust that does not now exist between the parties involved. If it did, however, that interdependence could conceivably serve as a mortar with which a foundation for more extensive accords could be built. Not only would the construction of a Peace Pipeline that connects Syria, Jordan, the West Bank and Israel solve the water shortages for the foreseeable future, but also, in the mold of a New Deal project, provide jobs for thousands of laborers for possibly the next ten years. More importantly, it could free Israel from its dependence on the water sources in the Golan Heights and the West Bank. The pipeline is a solution that would create a co-dependent relationship between these states that might require a level of cooperation that does not currently exist.

RECENT ISRAELI INITIATIVES

In 2000, Israel adopted a long-term water plan that is national rather than regional in scope. The plan calls for the building of a series of desalinization plants over the next twenty years with a tender being granted in September 2001 to begin construction of the first facility. Estimated construction cost for this plant will be \$150 million with a water producing capacity at 15 to 65 mcm/year.⁴⁰ With the first plant estimated to be operational in five years, Israel intends to purchase the additional water from Turkey to meet the current deficit. In August 2002 the

government announced its intent to purchase 50 mcm/year of water from Turkey for the next 20 years. The water will be shipped via tanker to the port city of Ashcalon where it will be purified prior to distribution.⁴¹ This plan will allow Israel to meet its commitment based on the 1994 bilateral peace treaty, to provide the Kingdom of Jordan 55 mcm of water a year as well as providing an additional 77 mcm/year to the Palestinian National Authority. It does not, however produce enough water to solve the problem of Israel's dependence on the West Bank aquifers or the Golan Heights and therefore falls short of being a multi-national solution upon which further accords might be built.

RECOMMENDATION: A ROLE FOR THE U.S.

The United States has an important role to play in addressing the Middle East water crisis. Facilitating a resolution of this crisis would serve three vital national interests. These are: 1) maintaining stability in the Middle East in order to ensure free market access to the oil reserves there; 2) ensuring the security of Israel and; 3) winning the Global War on Terrorism.

Resolving the Palestinian-Israeli conflict in a manner that is perceived to be fair and unbiased will build a foundation upon which the three vital interests listed above can be achieved. Past attempts to resolve this conflict have faltered when faced with several seemingly insurmountable hurdles. The disposition of Jerusalem, the return of the Golan Heights to Syrian control and ceding to the Palestinians sovereign control of the Occupied Territories are three of the more well known stumbling blocks. Ensuring that both peoples preserve access to water, however, is an issue that must be resolved to the satisfaction of both parties if a sustainable and acceptable peace accord is to be realized. Achieving a regional accord over water might be the first step towards solving land-related issues.

Certainly the crisis between Israel and the Palestinian Authority is one of the most volatile situations threatening international security today. Leveraging a solution to the water crisis might be one means by which the United States could prevent this threat from expanding to further jeopardize the world political and economic stability. Hunting down and killing foot soldiers of Al Qaida will be a task that spans generations unless the motivation for the disenfranchised to enlist is addressed. Establishing a peace between Israel and its neighbors that is perceived as equitable by all sides would address a core issue in the Global War on Terror.

Actively taking the lead in finding a regional solution to the water contest in the Jordan River Basin is an opportunity for the U.S. to assert its role as a world leader and assume the moral high ground on a complex human security issue. Moreover, it establishes a framework of

cooperation from which other Middle East agreements might be built, and identifies Israel-Jordan as a microcosm of a global problem that allows for the establishment of universal environmental principles. Through its role as Chair of the Multilateral Working Group on Water Resources, the U.S. could introduce Confidence Building Measures that would facilitate the cooperation required to solve this regional environmental issue. These could take the form of providing funding, training and technical assistance to support the development of Palestinian institutions for managing advanced irrigation methods. They might also aim at reducing the national policies striving for self-sufficiency in agriculture via favorable trade agreements. Any regional solution, whether the Peace Pipeline or some other comprehensive remedy, will require the enforcement of compromise and financial clout that only the U.S. is capable of wielding. In light of the recent water policy agreed to by the Israeli government the window of opportunity for intervening could soon be closing.

WORD COUNT = 6,580

ENDNOTES

¹ Peter Gleick, "Environment and Security: The Clear Connections," Bulletin of Atomic Scientists (April 1991): 19

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⁴ William J. Clinton, A National Security Strategy for a New Century (Washington, D.C.: The White House, October 1998

⁵ Gleick, 20.

⁶ Martin Sherman, The Politics of Water In the Middle East. An Israeli Perspective on the Hydro-Political Aspects of the Conflict (New York, St. Martin's Press, INC, 1999), 51.

⁷ Gleick, 20.

⁸ Sherman, 51.

⁹ Ibid., 48.

¹⁰ Ibid.

¹¹ Ibid., 91.

¹² Paul Adams, "Wazzani River at Heart of Explosive Crisis." Globe and Mail, 16 October 2002, sec. A, p. 11.

¹³ Natasha Beschoner, "Water and Instability in the Middle East," Adelphi Paper 273 (Winter 1992): 3.

¹⁴ Mostafa Dolatyar and Tim S. Gray, Water Politics in the Middle East (New York, St. Martin's Press, INC, 2000), 87.

¹⁵ Ibid., 85.

¹⁶ Beschoner, 11.

¹⁷ Ibid.

¹⁸ Ibid., 13.

¹⁹ Dolatyar and Gray, 92.

²⁰ Ibid.

²¹ Beschorner, 15.

²² Dolatyar and Gray, Table 4.3, 91.

²³ Ibid., 90.

²⁴ Beschorner, 16.

²⁵ Kent H. Butts, "The Strategic Importance of Water," Parameters (Spring 1997): 69.

²⁶ Ibid., 71.

²⁷ John Flesher, Water Systems in Trouble, Oct 21, 2000, Associated Press. Pg 1.

²⁸ Beschorner, 16.

²⁹ Ibid., 12.

³⁰ Stephan Deconinck, "Israeli Water Policy in a Regional Context of Conflict: Prospects for Sustainable Development for Israelis and Palestinians," December 2002; available from <http://waternet.rug.ac.be/waterpolicy.htm>; Internet; accessed 10 March 2003, 1.

³¹ Aaron T. Wolf, "Hydrostatic Territory in the Jordan Basin, Water, War and the Arab Israeli Peace Negotiations", in Water in the Middle East: A Geography of Peace, ed. Hussein A. Amery and Aaron T. Wolf (Austin: University of Texas Press, 2000), 88-90.

³² Beschorner, 108.

³³ Deconinck, 6.

³⁴ Beschorner, 190.

³⁵ Ibid., 191.

³⁶ Sherman, 110.

³⁷ Randy Deshazo and John W. Sutherlin, Building Bridges, Diplomacy and Regime Formation in the Jordan River Valley (Lanham, University Press of America, 1996), Table 4.2, 103.

³⁸ Sherman, 72.

³⁹ Deshazo and Sutherlin, 103.

⁴⁰ Deconinck, 8.

⁴¹ Ibid, 9.

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