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HYDRO POLITICS IN THE EASTERN MEDITERRANEAN

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Introduction

The East Mediterranean region is part of the MENA (Middle East and North Africa) region, which is recognized as one of the driest and most water scarce regions in the world. The MENA region is reported to contain less than 1% of the global renewable water resources while its population exceeds 5% of the world's total population (1). Most of the surface and ground water resources in the East Mediterranean are transboundary. The transboundary surface water resources stem from two major waterways: the Tigris-Euphrates and the Jordan River systems. The riparian countries of the Tigris-Euphrates system are Turkey, Iraq and Syria. The riparian countries of the Jordan River System are Lebanon, Israel, Palestine, and Jordan. The surface waters in the region are the main sources of water especially for agricultural use (2). The most productive groundwater transboundary water resources are the West Bank Aquifer System on the west side of the Jordan Rift Valley and the Coastal Aquifer on the south-eastern side of the Mediterranean Sea. Both aquifers are shared between Israel and Palestine.

The current management of the water resources in the East Mediterranean region is unsustainable and is characterized by overexploitation, pollution and the lack of apposite agreements between riparian countries. Overexploitation is depleting the water resources and the problem is expected to exacerbate with higher future water demand required to satisfy the needs of a rapidly growing population and the expanding needs in agriculture and industry. Water pollution on the other hand has also contributed to the deterioration of the water resources and to a general decline in water quality. Moreover the water allocation has been characterized by a lack of agreements between the countries that share the water resources accompanied by the absence of a comprehensive and integrated management of these resources. Competition over the utilization of the water has made the water a catalyst for conflict in the region.

This article will attempt to describe and classify the water resources in the region into the admitted water colours. The admitted water colours are the Blue Water and the Green Water. The Blue Water refers to the water flows in groundwater and surface water that are accessible for societal use. The Green Water is the fraction of water that is consumed by plant production or that evaporates from moist surfaces. In addition to the Green and Blue Water colours, the Yellow Water is proposed herein to denote the fraction of water allocated to riparian countries according to regional power struggle rather than being the outcome of agreements, negotiations and equitable principles. This paper will investigate

how Yellow Water (i.e. conflict over water) results in the deterioration of the Blue and the Green Waters.

BLUE WATER

The majority of the transboundary Blue Water in the East Mediterranean Region stems from the Euphrates-Tigris and the Jordan River systems. The Euphrates River and the Tigris River arise in the eastern mountainous areas in Turkey and flow through Syria and Iraq. They join together in southern Iraq, to form Shatt Al-Arab, which flows to the Persian Gulf. The Euphrates annual flow is approximately 29 BCM with 88 % of its water originating in Turkey and the rest is added in Syria, before flowing into Iraq. The annual flow is estimated at 48.7 BCM. The Jordan River system arises from the eastern mountains in Lebanon. The river flows along the Jordan Rift Valley through the Lake Tiberias tapping into the Dead Sea. The base flow of the river is derived basically from the carstic springs on the western and southern slopes of Mount Hermon. These springs flow into the Hasbani, Dan and Banias tributaries. The three tributaries merge to form the Jordan River which flows southwards through the Huleh Valley with a median annual volume of around 500 MCM. From there it descends to supply Lake Tiberias, which also gets water from productive side streams and springs. The water leaves the lake either through evaporation or through the Israeli National Water Carrier. The supposed remaining surplus of the lake is released to the southern part of the Jordan River, which should receive water from the Yarmouk River with an annual flow of 203 MCM, however, much of the discharge from the Yarmouk River is diverted for water supply in Jordan before it confluence with the Jordan River (5). Such actions along with the tapping of storm water in Dams constructed along the Eastern and Western wadis of the Jordan River has reduced the river's historic annual flow from 1250 MCM to 200 MCM of bad water resulting in detrimental ecological consequences and in an average annual drop of 1 meter of the Dead Sea water level, the final discharge point of the Jordan River.

The most productive groundwater transboundary water resources are the West Bank Aquifer System on the west side of the Jordan Rift Valley with an annual safe yield of approximately 680 MCM and the Coastal Aquifer on the south-eastern side of the Mediterranean Sea with an annual safe yield of approximately 372 MCM. The West Bank Aquifer is composed of three water basins, namely the Western, Eastern and the North-Eastern basins. The Coastal Basin covers an area of about 2000 km^2 and is characterized by flat relief. It has an annual safe yield of 372 MCM with the water flowing westward towards the Mediterranean Sea. The water quality is generally of good quality but chloride concentrations of as high as 6000 mg/l occur in local areas along the coast such as in Gaza where 95 % of the withdrawn water is not suitable for domestic consumption.

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Green Water

Green Water is the fraction of water that evaporates from moist surfaces or that is consumed by plant production and is therefore linked to food security. Agriculture in today's world uses more water than any other human activity.

YELLOW WATER

The limited water resources and the inequality of the water consumption have raised several conflicts between the riparian countries in the region. The current allocations of the shared water resources among the riparian countries in the region are the result of the regional power struggle rather than the outcome of agreements, negotiations and equitable principles. The power holder in regional hydro-politics is usually the upstream riparian having more relative strength than its downstream neighbours. However, in the Eastern Mediterranean Region, it appears that the more conventional measures of military, political and economic strength are the deciding factors in regional hydro-politics.

Indeed, water allocation amongst the riparians countries of the Euphrates-Tigris River system appears to be determined through political and economic strengths. The rivers are supposed to have a significant surplus, but the numerous unilateral management projects have lead to a serious decline in the water quantity and quality. In 1974, Syria inaugurated Al-Thawrah Dam at Tabaqah. When the Syrians began to fill the reservoir at Lake Asad, the flow to Iraq dropped from the normal 920 m^3/sec to 197 m^3/sec. This lead to serious political tension and troops on both sides were redeployed to the mutual border. More recently, Turkey emerged as the more dominant political and economic power among the riparians. Turkey's activities on the Euphrates and Tigris rivers have had severe impact on the water quantity and quality reaching Iraq and Syria (12). Turkey launched the Southeast Anatolia project, known by the Turkish acronym GAP. The project will result in 22 dams, and 19 hydroelectric power plants on both the Tigris and the Euphrates. It also includes numerous networks of irrigation canals to deliver water to over nearly 1.7 million hectares of land. This will of course affect the flow of water downstream to Syria and further down to Iraq. Furthermore, the quality of the Euphrates is deteriorating downstream because of urban and industrial effluent, back-drainage from the irrigation projects, and high evaporation rates that concentrate the salts.

Water allocation amongst the riparians countries of the Jordan River System is determined through military, political and economic strengths. More than 50% of the Jordan River Water flow is allocated to Israel, evidently the nation with the most military, political and economic strength in the region. While Eric Johnston proposed an agreeable plan for water allocation amongst the riparians in 1995 and technical committees from the riparian countries accepted the plan, it was never ratified. Table 1

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shows the difference between the Johnston plan and the current water allocation. While the average annual flow at the outlet to the Dead Sea should be 1315 MCM, the actual volume of water reaching the Dead Sea is approximately 200 MCM of bad water.

Table 1. The Jordan River water allocations in MCM

Country	*Johnston*	*Current*	*Difference*
Syria	132	153	+21
Lebanon	35	7	-28
Jordan	720	480	-240
Israel	400	647	+247

Source: Soffer, 1992 (14)

Similarly, groundwater allocation from the West Bank Mountain Aquifer and the Coastal Aquifer on the south-eastern side of the Mediterranean Sea is unequally distributed amongst the Palestinian and Israeli populations. As mentioned before, the safe yield of the shared West Bank Mountain Aquifer is approximately 680 MCM/year of which only 115 are allocated to the Palestinians. Similarly, the water allocation from the Coastal aquifer in unequally distributed. Inequality in water allocation between the Palestinians and Israelis in the West Bank and Gaza Strip, and the Israelis and Arab population is evident in figure 1.

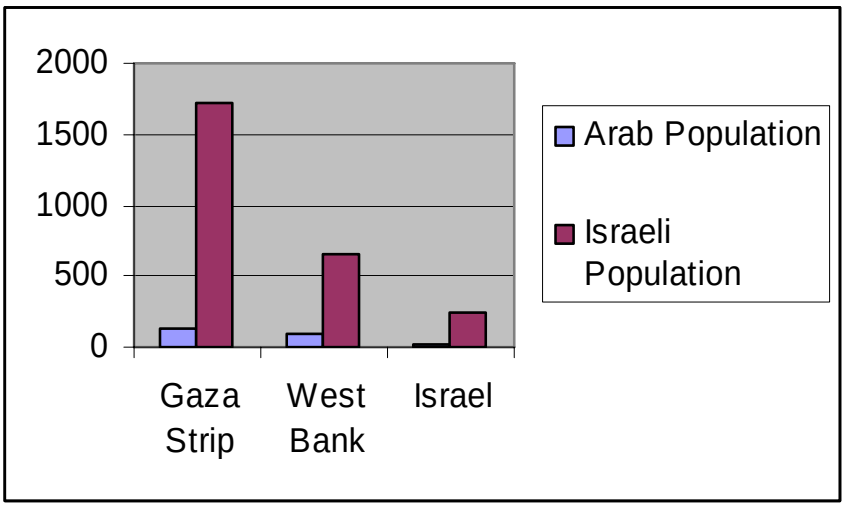

Figure 1. Water allocation in the Palestinian Territories and Israel. The columns show the annual water consumption in m^3/person.

The feeling of injustice arising from the unequal distribution of water resources between Israel and Palestine is compounded by the fact that Israel allocates more than 60% of the fresh water resources it controls to agriculture which in turn contributes to only 1.8% of Israel's real growth GDP and employs less than 1% of its labour force.

Israel is currently utilizing more than 80 % of the Palestinian groundwater resources and denying Palestinians their rightful utilization of the Jordan River. Palestinians are currently allocated 80 MCM per year for domestic use leaving the per capita consumption under suppressed demand at an average of 25 cm/year, which is far below the required standards of water supply. For agriculture, Palestinians have access to 150 MCM per year which they are using to irrigate around 10 % of their cultivated lands while Israel is enjoying abundant water to irrigate 50 % of its cultivated land. The current water allocations came about as a result of *fete compli* arrangements reflecting the balance of power rather than internationally formulated agreements.

According to Oslo II agreement, Israel recognized the Palestinian water rights, but these are to be negotiated in the permanent status negotiations. However, so far, no negotiations have taken place to enumerate the Palestinian water rights. The issue of Palestinian water rights will be one of the most difficult issues in the final status negotiations. The Oslo II agreement included arrangements for delivering an additional 28.6 MCM for the Palestinians to meet their immediate needs for domestic water use during the interim period. Regrettably, only 15 MCM of additional water has reached the Palestinians which are not enough to meet the growing needs of the population which is still experiencing shortage of water supply.

Israelis and Palestinians should immediately and forcefully adopt a holistic approach in addressing their water conflict. The interdependency between water management and environmental protection, social progress and economic growth is clear and necessitates joint water management schemes which will ensure equity in water accessibility to both Palestinians and Israelis. Unless these issues are addressed immediately and properly according to international norms that will translate into actual water in their pipes, Palestinian will remain the thirsty partner in the Middle East with a severe water crisis that will impact the sustainability of the peace process. The paper will address the Israeli-Palestinian water conflict and propose ways and means of resolving it.
Palestinian Water specialists criticized the agreement because it did not deal with the Palestinian water share in the Jordan River, and the shared Western and Northeastern Basins of the West Bank Aquifer System, as well as a reduction in the Israeli water consumption from the Palestinian water resources or the quantities provided to the illegal Israeli settlers in the West Bank or Gaza Strip. The agreement indicates that the Palestinians can increase their water supply from the Eastern Aquifer Basin of which an additional 78 MCM of water can be exploited. Most experts agree that the Eastern Basin could not yield this additional amount claimed by Israeli experts. However, for political reasons, their opinion was not seriously considered. The drop of the water level in the Palestinian wells in the Eastern Basin is raising alarm about its sustainable yield. Thus, it is believed that the maximum amount that could be extracted is 12 MCM. Despite the additional water allotments mandated by the Oslo agreements, the distribution of water

resources remains the same and Israel does not fulfil what has been agreed upon in the signed agreement.

An outlook into the future

Water resources know no boundaries. Most water resources in the world are shared and the East Mediterranean is no exception. Managing shared water resources should be integrated and involve all the actors involved. Living in the 21st century with the history of the past at hand it ought to be self-evident to make the distinction between hydrology and "hydromythology". The blue waters of the region are enough to meet the needs of the overall population for a long time to come, if managed in an endogenous way. The management does not only include allocation of water quantities, but most importantly, it involves the protection and sustainable utilization of the resource. The mutual recognition of each others water rights is a good start. Resolving the water conflict between the Israelis and the Palestinians will open the way in many directions. There would be a decrease in the reasons to conflict, and an increase in economical growth and environmental development. Furthermore it would guarantee regular supplies of household water. Nevertheless, the bilateral agreements cannot be a substitute for an integrated and comprehensive water policy that should include all riparian countries to international river basins. In recent years, the world has been moving from hydro-sovereignty to hydro-solidarity. The East Mediterranean should start such an approach. The Jordan River Basin may be an ideal candidate for promoting a "basin wide regional institution" in which all actors need to be involved.

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