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Water Geopolitics in the Middle East

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Abstract – According to many experts, water is the new gold of the century as water crises are increasingly being observed throughout the world and billions of dollars are being spent to solve water shortage problems, more particularly, in the Middle Eastern countries. As countries of the Middle East are generally scarce in water supplies, they will try to use their economic, political, and military power to seize other neighboring lands that are plenty with water resources such as surface and ground water, rivers, and basins. This paper deals with the geopolitical water problems and challenges in the Middle East. It is an analytical study that examines the geopolitical issues related to water in several Middle Eastern countries including Lebanon, Jordan, Egypt, Israel, and Palestine. It sheds the light on the relation between the geographical characteristics of the water capitals in the Middle East and the national and regional politics, disputes, and conflicts. Furthermore, the international laws for water exploitation including the Humanitarian laws, Geneva Convention, Helsinki rules, in addition to other legislative rules and resolutions pertaining to water conservation and protection are all to be examined. Another discussed issue is the problem of water sharing between the different riparian and the legislative framework that governs them. This would pave the way to discuss the various conflicts and wars waged to seize water wealth in the Middle East, stressing on the different water clashes between Israel, Lebanon, Syria, Palestine, and Jordan.

Keywords – Geopolitics; Water Geopolitics; Middle East; Water War

1. Introduction

The greatest and most valuable resource in the Middle East might be water, and not oil as one would expect. Iran and Turkey are far the only two nations that are self-sufficient in water. Others countries depend on the water of rivers, wells, and springs that flow into their land from a neighbor country. Actually, 70% of the Arab countries rely on water flowing from non-Arab territories. As a consequence, the Middle East is maybe one of the most politically dangerous regions in the world. Boutros Ghali, an Egyptian diplomat has warned earlier that the prospective war in the Middle East will be fought over water.

For instance, 88% of the stream of the Euphrates River originates from Turkey alongside with Tigris. The Euphrates River provides the sole reliable water supply to the east of Syria and Iraq. Upon reaching the delta of the Euphrates, Tigris, and the Karun, the Euphrates loses a lot of water and begins to go down direct to its final end in the Persian Gulf [1].

Another example is the Jordan River which comprises Jordan, Syria, Lebanon, and Israel. It delivers 60% of Israel water and 75% of Jordan water. After several years of the foundation of Israel, Israel found itself sharing the Jordan River with Syria and Jordan. When the Arab nations allied against Israel, they have agreed to divert Jordan water into Lebanon, via the Golan Mountains, east to the Yarmuk River on the boundary between Syria and Jordan. The project would have diverted a rough 77% of the entire flow of the Jordan River, leaving Israel with only 23% of the water flow. In response for that, Israel took the Golan Heights as well as the West Bank. The major reason for taking the Heights was to control sources of fresh water, in addition of being a significant strategic military site. Currently, Israel uses water at a high rate around more than 500 cubic meters per person/year. Around 40% of its water are drained from the West Bank, and is thus a vital resource of water for the country.

Another example is the Aswan Dam built in 1898, it is of 20 meter high, and it effectively dammed one of the largest rivers in the world. The Aswan Dam was very beneficial to Egypt agriculture; however, as Egypt population increased 5 times from 1870 to 1970, the available food per capita had decreased, instead of getting increased. The entire reservoir is 2000 square miles in area and 300 miles long. After the treaty between Egypt and Sudan for sharing the Nile waters, 55.5 cubic km/year was allocated for Egypt, 18.5 cubic km/year was allocated for Sudan, leaving only 10 cubic km/year for evaporation from the Aswan Lake, for a total of 84 cubic km/year.

2. International Laws for Water Exploitation during Warfare

Over the past decades water exploitation has been of great interest in the Middle East, especially with the many conflicts between Israel and the Arab countries. As a consequence, several international laws were suggested to define the obligations and responsibilities of occupying countries in connection with water resources in the occupied countries.

2.1 Humanitarian Law (HR)

Humanitarian law has dedicated only a few of its provisions to the regulation of water in armed conflicts. Though, the HR does not provide a detailed examination of the obligation and responsibilities of occupying powers with regard to water resources, these norms represent a secure basis to self-protection as well as to the protection of all natural resources. The provisions of the **HR** which classify water resources as private property are articles **46** and **52**. **Article 46.2** states that "private property cannot be repossessed". Above all, the aim of the requisition is to support the occupant military army and their needs. Also, the requisition "shall be in proportion to the resources of the country". In other words, the occupant power must safeguard the economic and environmental sustainability of the occupied country. Finally, the occupant must pay recompense for requisitions authorized by **article 52 HR**. Likewise, **article 46.2** states that private water resources such as reservoirs and wells cannot be possessed by the occupying power. **Article 52** states that the exploitation of water resources during the war must be in proportion of the global capacity of the occupied country in order to help occupied population to self-develop by their own after the end of the war. To finish, **article 52** obliges the occupant to set rewards for requisitions of private water resources [2].

2.2 The Fourth Geneva Convention (GC IV)

The **GC IV** covers "bill of rights with a catalogue of fundamental rights which, immediately upon occupation and without any further actions on the part of those affected, becomes applicable to the occupied territories and limits the authority of the occupying power". Actually, as long-established by the Convention "travaux préparatoires", the all four **GC** are applicable to any armed conflict, either it is or not recognized as a state of war by the different parties and "in cases of occupation of territories in the absence of any state of war". The most notable sources of the law of military occupation are **article 27-34** and **47-78 GC IV**.

The convention does not provide a systematic, nor analytic protection of water resources during the war and in armed conflicts. Nevertheless, **article 53** and **55 GC IV** define the general legal framework useful to handle the problem of water control and exploitation in the OPT. **Article 33, 56,** and **147 GC IV** also note that. **Article 53 GC IV** protects property by banning the occupant from destroying "real or personal property belonging individually or collectively, or to the State, or to other public authorities, or to social or co-operative organizations". The **GC IV** takes into account only one single exception to this norm, particularly in case of "military necessity" stipulated in **article 53 GC IV**.

The most pertinent difference between this obligation and Hague assessment is that the first extends the protection even to public and collective property. Since the creation of **article 53 GC IV** which deals with all types of property and the prohibition that concerns all of them, it is unclear when applied on water issues at what point an occupant utilization ends up in destruction under the terms of the Geneva Convention.

It is obvious that the burden of self-refill of a water reservoir represents a suitable criterion of judgment. **Article 55 GC IV** establishes a further obligation on the occupying power, particularly that to ensure food and medical supplies to the inhabitants of the occupied territory. The occupant has also the duty to provide them the "necessary foodstuffs, medical stores and other articles" if the resources of the occupied territory are inadequate stipulated in **article 55.1 GC IV**. Moreover, **article 55.1 GC IV** states plainly that the occupying authority must not demand "foodstuffs, articles or medical supplies", except for use by the occupation army and its administration personnel and only if the requirements of the indigenous population have been taken into account. Lastly, close to **article 52 HR**, **article 55.2 GC IV** settles that the occupant must pay compensation for his demands. Although, **article 55 GC IV** does not make any explicit reference to water, it is unquestionable that this resource is included in the word "foodstuffs". The ICRC commentary recognizes that the main purpose of **article 55** was that to avoid the starvation as thousands of people died during World War II. Furthermore, by imposing strict limitations on requisition of "foodstuffs, articles and medical supplies", the purpose of **article 55** was to reduce the impact of requisition on the occupied country. Similarly to **article 52 HR**, **article 55 GC IV** obliges the occupant not to demand supplies for the use by its own population.

The protection of property and including water resources mentioned by the **GC IV** is further supported by **article 33, 56** and **147**. The first forbids revenges against "protected persons and their property" stipulated in **article 33.3 GC IV**, whereas the second one **article 56.1 GC IV** states that the occupying country has to carry out the duty of ensuring and maintaining public health and hygiene in the occupied territory and of preventing the spread of contagious diseases and epidemics. Besides, **article 147 GC IV**, underlines that, among other violation, the "extensive destruction and appropriation of property" must be considered as a serious breach [3].

2.3 The 1977 Additional Protocol to the Geneva Conventions (AP I)

Protocol I protects water resources in armed conflicts through a legal framework composed of **article 54, 55, 56** and **85**. The first paragraph of **article 54 AP I** states that "starvation as a method of warfare is prohibited".

Protocol I discards explicitly the implementation of such a military practice and it is not tolerable regarding this matter. Equally, the statute of the International Criminal Court (ICC) establishes that "internationally using of starvation of civilians as a method of warfare by depriving them of the objects indispensable to their survival" is a war crime in international law of military occupation. **Article 54.2 AP I** definitely forbids "to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population". This includes foodstuffs, agricultural areas, livestock, crops, water installations, supplies, and irrigation projects. Thus, water resources and supplies are specifically and extensively protected by **article 54.2 AP I**. More to the point, **article 54.2** is further supported by **paragraph 4** of the same article, which forbids and completely bans revenges on the aforementioned objects.

Article 56 AP I excludes the above objects from becoming military targets unless they are of a military threat to the occupant. This rule prohibits attacks against dams, water stations, dykes, nuclear electrical generating stations, chemical plants, and petroleum refineries. In this context, the attacker must always respect the principle of proportionality between losses inflicted and military advantage gained from the destruction of military objectives.

Finally, the **1977 AP I** in **article 55 AP I** protects indirectly water resources by stating that the attacking power shall not harm the environment, that is, it forbids causing "widespread, long-term and severe damage" [4].

2.4 The 1966 Helsinki Rules

The 1966 Helsinki Rules organized international law for the first time, on the basis of consensual and regional practice and experience of countries. It dealt with international watercourses which extend over geographical areas between two or more countries, including surface water and underground water. **Article IV** states that each basin state is entitled to a "reasonable and equitable share" in the uses of the waters of an international basin, within its own territory. Additionally, **article VII** of the Helsinki Rules states some "relevant factors" that might be useful to determine what an equitable and reasonable share of watercourse. Even though this article classifies some interesting issues, it is not obvious, its statements could be interpreted in a different way and used to each state's own perspective. **Article VII** of the Helsinki Rules, which provides that a basin state may not be deprived of the present reasonable use of the waters of an international basin to reserve the rights of such waters. Besides, it doesn't help states to settle their dispute over water use, which could end by being more problematic [5].

2.5 The 1997 UN Convention on Watercourses

It was officially adopted by the General Assembly in 1997, and although it re-calls many of the principles set in 1966 **Helsinki Rules** and explains them in more detail, the convention stresses a newly maintainable development approach to the usage and management of international water resources.

Article 5 of the convention refers to the principle of reasonable and equal utilization of an international water resource. Additionally, the article adds that two constraints should be considered in doing so, more specifically in the welfares of the watercourse states and the need for an acceptable defense to protect the watercourse itself.

Article 20 insists on maintaining "the ecosystems of the international watercourse", and **Article 21** insists on controlling and reducing water pollution.

Article 7 is the second important principle set by the UN convention on watercourses. It states that watercourse nations should "take all appropriate measures to prevent causing significant harm" to other watercourse States, in terms of exploitation and utilization. It is worth noting that **Article 7.2** does make reference to the issue of compensation and reimbursement.

Finally, **Article 8** imposes on watercourse states an obligation to cooperate on the basis of sovereign equality, territorial integrity, mutual benefit, and good faith so as to achieve "optimal utilization" and "protection" of any international watercourse [6].

2.6 The 2008 Draft Articles on the Law of Transboundary Aquifers

International Law Commission (ILC) adopted 19 "Draft Articles on the Law of Transboundary Aquifers" in 2008. The ILC Draft Articles recall all the elementary rules and principles of the 1997 UN Convention on Watercourses, however, taking into account the specific physical and geological characteristics of groundwater.

Article 4 states that aquifer States should utilize transboundary aquifers based on the principle of equitable and reasonable utilization. Article 4 has distinctly differentiated between the nature of groundwater and surface water.

Article 6 requires the aquifer States to take all necessary measures to stop the causing of noteworthy harm to other aquifer States. The ILC stresses that when significant harm is caused, the aquifer State is the sole responsible for such harm.

Article 7 provides a general obligation to cooperate which is quite identical to the obligations stated by the UN Convention on Watercourses [7].

3. Shared Water & Their Legal Framework

Inherently, 60% of Middle East surface water resources flow from outside the Middle East region. The rivers that are shared between non-Arab and Arab countries are the Nile, the Jordan, the Tigris, the Euphrates, and Shatt Al-Arab, in addition to the Senegal River, the Jubba, and the Shabele. Similarly, some underground aquifers are shared between Egypt, Libya, and Sudan as their streams penetrate the underneath sandstone rocks. Other groundwater aquifers are also shared between Turkey and Syria.

The shared water issue, if unsolved and inadequately distributed, will remain an issue of delayed development, conflicts and can cause military conflicts between the various involved nations. Furthermore, part of the Arab water is under the Israeli occupation, particularly in the Golan Heights and in the territories of Palestinian. Water in these lands is prone to exploitation by Israel and can deprive the occupied countries from accessing and utilizing their private national water resources. Certain institutional issues must be implanted in order to preserve the rights of each state to use its own water resources.

3.1 Legal and Institutional Context

Several principles exist to regulate the exploitation of international rivers and they include the following:

1. Whatever was settled previously by a riparian country should be always respected.
2. Each country is eligible to obtain an equal share of water.
3. The water of the river must be equitably distributed.
4. Abiding by rules of not producing harm or damage to any other riparian country.
5. Upon building dams to divert the river course, negotiations with riparian countries must take place.
6. Riparian countries must cooperate in order to manage the shared water resources and protect the river environs.

The Helsinki Rules and 1997 UN Convention discussed in previous sections endorse the principle of "reasonable and equitable" sharing of the water of international rivers. However, Arab countries had somewhat different viewpoints regarding this convention. For instance, out of 22 Arab countries, 15 voted for the convention, 6 didn't vote at all, and only 1 country refrained from voting. The voting countries are: Jordan, Syria, Algeria, Saudi Arabia, UAE, Bahrain, Kuwait, Libya, Qatar, Morocco, Tunisia, Djibouti, Oman, Sudan, and Yemen. Egypt was the only Arab country that refrained from voting, whereas Lebanon, Comoros, and Mauritania were absent, while Palestine, Iraq, and Somalia didn't have representatives.

Legal systems are still poor in the Middle East and not seriously formulated as most of shared rivers, suffer from the lack of full international agreements that are crucial and prerequisite for ensuring stability, peace and prosperity in the riparian countries [8].

3.2 The River of the Nile

In 1902 a treaty between Great Britain and Ethiopia was established to prohibit Ethiopia from diverting the Nile water. In 1929 treaty between Egypt and Sudan set that 48 bcm/year to Egypt and 4 bcm/year to Sudan. Colonial power committed no use of water for irrigation and power by its other colonies in White Nile basin. In the 1959 Treaty between Egypt and Sudan after the Sudan independence in 1956 and Aswan Dam planning in1952 set 55.5 bcm/yr for Egypt, 18 bcm/yr for Sudan, and 10 bcm/yr for see and evaporation. Furthermore, in 1991, Sudan and Ethiopia agreed to explore cooperation over Blue Nile and Atbara rivers and it alarmed Egypt. In 1993 a Framework of general cooperation between Egypt and Ethiopia was set in which both parties agreed not to do anything with Nile to cause appreciable harm to other.

Back to the convention of sharing water, none of the riparian states approved the Convention. For instance, in the convention at UNGA, Sudan accepted; Burundi objected, whereas Egypt, Rwanda, Ethiopia, and Tanzania abstained; and Uganda, Eritrea, and Zaire did not attend at all. Ironically, Egypt didn't like the term "international watercourse" though it likes article 7 whereas Ethiopia liked article 5. In this context, Ethiopia abstained in the voting as it considers the text of the Convention not fair and balanced. Article 7 and Part 3 of the Convention were also of particular apprehension.

In more details, Egypt abstained in the vote as she expressed the wish that its adoption of the Convention would improve the Assembly purpose in developing and organizing international law, with the purpose of endorsing international peace and upholding the security of the state. Rwanda objected on article 33 and article 2, that deal with the management of underground water and hence they abstain in the vote. Tanzania expressed that the convention could have been better due to the deposit of 35 instruments of sanction and accession [9].

3.3 The Jordan River

The dispute over the Jordan River is one of the noteworthy factors of the Arab-Israeli Conflict. It was behind the 1967 War and the Israeli occupation whose purpose was to destroy existing Arab water projects to divert the water stream of the Jordan River. This has delayed the settlement of a comprehensive agreement in the region between the Jordan River riparian countries. Besides, the Peace Treaty between Jordan and Israel in 1994 came up with several clauses related to water. Likewise, in the Oslo Agreement between Israel and the Palestine there were unclear references to water sharing in the Jordan River.

Nevertheless, there still two Arab states, Syria and Lebanon that until now are far from any agreements concerned with the Jordan River. Similar to Jordan and Palestine, territories of Lebanon and Syria are susceptible to Israeli occupation and illegitimate misuse of the water resources of the Jordan River.

In fact, the Jordan River is located in an area called Bilad Al Sham which respectively includes: Syria, Palestine, Israel, Jordan, and Lebanon. The River is about 350 km long, it commences from the footfalls of Mount Hermon aka Jabal Al-Sheikh on the border between Palestine, Syria, and Lebanon and ends up in the Dead Sea. It has a total flow of around 1300 Mm^3 yearly. The Jordan River has three main streams to its origin:

- Dan (Al-Qadi) which originates from Palestine and has a total flow of about 250 Mm^3 yearly.
- Banias and originates from the Golan Heights in Syria and has a total flow of around 125 Mm3 yearly.

- Hasbani which originates from South Lebanon and has a total flow of about 125 Mm^3 yearly.

The major elements of the Jordan River are: Upper Jordan (between its origin on Mount Hermon and Tiberias Lake), Lower Jordan (between Tiberias Lake and the Dead Sea), Yarmuk River Tiberias Lake, and the Dead Sea.
Israel is currently diverting the water of Upper Jordan using its National Water Carrier which transmits the water from Tiberias Lake to the middle and south of Israel. The war conflict on the Jordan River is mostly between Israel on one hand and other riparian of the river, notably Lebanon, Syria, Palestine, and Jordan.

In order to distribute the Jordan River water between the riparian states. The Johnston Plan was conceived at time of US president Dwight Eisenhower. As a result, Israel uses more than 700 Mm^3/year, that is 300 Mm^3/year more than its share. Palestine uses nothing and the remaining countries Syria, Lebanon, and Jordan use about 410 Mm^3/year [10].

3.4 The Tigris and Euphrates Rivers

The Tigris and Euphrates river are located Southwest of Asia, and include the Tigris and Euphrates rivers, which have their sources within 80 km of each other in eastern Turkey and travel southeast through northern Syria and Iraq to the head of the Persian Gulf. The total length of the Euphrates is about 2,800 km. The Tigris is about 1,850 km long. It worth mentioning that no comprehensive international treaties exist between Iraq, Syria, and Turkey for sharing the water resources of the Tigris and the Euphrates Rivers. However, there were several agreements signed in the 1920's that address how to use the water of the two rivers among these countries. A Turkish-Iraqi Protocol was proposed on 29 March 1946 to control the flow of water between the two countries. Likewise, in 1982, Iraq and Turkey agreed to found a Joint Committee whose decree included the exchange of information and technical consultation regarding climatic changes and the vaporization of water. Afterwards and in 1983, Syria took part of this agreement. In spite of this work, the Committee met irregularly and it was unable to validate the implementation of the espoused recommendations. Lately, the Committee returned to meet on a regular basis in an attempt to conclude a comprehensive agreement between all of the three states. That way, the rights of the three riparian states would be reserved on the basis of equity and fair water distribution [11].

3.5 Water Share in Occupied Territories

Palestinians living in the occupied territories and Syrians living in the occupied Syrian Golan Heights after the 1967 War suffer from scarcity of water, not due to the limited water resources available in these areas, but due to the control over these resources by the Israeli occupation authority. Under the conditions brought about by the siege imposed by the Israeli, civilians of the occupied Palestinian territories suffered from lack of basic rights to access the necessary resources for the maintenance of their daily needs and basic health. From the 1967 War to date, the Israeli occupation authority has adopted a discriminatory policy with regard to allocating water to Israeli settlers and Palestinians. The average quantity of freshwater available in Israel and the occupied Palestinian territories per year is slightly over 2.4 billion cubic meters. Israel allocates approximately 90% of this amount to itself, leaving the Palestinian population just over 10%. If water resources were divided into equal per capita shares, Palestinians would receive approximately 45%. Of the water available from the West Bank aquifers, Israel uses 73%, West Bank Palestinians use 17%, and illegal Jewish settlers use 10%. The Israeli occupation authority has destroyed 140 Palestinian wells to divert the water through Israel's national carrier. Palestinians were only allowed to dig 13 wells in almost 20 years. Meanwhile, Israel has drilled a chain of very deep wells alongside the eastern and northern borders with the Gaza Strip to hunt for more groundwater of the coastal aquifer thus depriving the Palestinians of their own water. In so doing, UN scientists estimate that Gaza will have no potable water within 15 years. Nonetheless, continued destruction of water infrastructure by the occupying forces leaves the Palestinian population without basic water supply and sanitation services for extended periods. Moreover, the Israeli Separation Wall, whose main part is built over the Territories of the West Bank, is considered a very important tool for seizing more than 85% of the Palestinian water resources. Despite the water struggle with Israel, the Palestinian Water Authority that was established in 1996 managed to issue the water law only in 2002. It has been concluded that most of the water rights for Palestinian people are in the hands of Israeli authorities, who are encroaching on the Palestinian water right which is a tributary to the right of self-determination. The Israeli Occupation Authority also exploits all the water of the Baniyas River spring and the tributaries of the Yarmuk River in the occupied section of the Golan Heights. They have also drilled many wells all around the Occupied Syrian Golan to deplete millions of cubic meters of groundwater and divert this water to settlers inside Golan and Israel. Furthermore, the Israeli Occupation Authority depletes the Tiberius Lake and diverts its water through pumping stations and pushing pipes inside Israel and the Negev. The over-pumping of the water of the lake and the diversion of some of the rivers that feed the lake by the Occupation Authorities have led to the reduction of the level of the lake and have caused a significant decrease of the water that flows from the lake feeding the Dead Sea. Meanwhile, the Israeli Occupation Authority also prevents the inhabitants from drilling wells in their farms and fields. The International Community should bear the legal, moral, and human responsibilities to lift the injustice done to the rights of Palestinians and Syrians on their national water resources. Israel uses most of the Palestinian water resources and prevents the Palestinians from using them. This includes groundwater, surface water.

4. Water Wars in the Middle East

Since the foundation of state of Israel in 1948, conflicts have aroused between Israel and the Arab countries. To some, Israel only took off the territories of Lebanon, Syria, and Jordan just for their lands, while others suggested that Israel implicitly does mostly care about water in these countries. In this section, the different disputes and conflicts over water resources in the Middle East are to be presented.

4.1 The Israeli-Jordanian Water Conflict

Since the Six Days War, due to its downstream position on the Jordan River and its weak strategic standing on the Yarmouk, Jordan has been greatly disadvantaged in its water use opportunities. Since the late 1960s Israel has virtually monopolized the waters of the Upper Jordan. Jordan has been totally excluded from tapping this source, despite having been allocated 100 mcm or about 18% of the Jordan's water in the Johnston Plan. On the Yarmouk, Jordan suffered from long-standing Israeli stalling against building a storage system to improve water diversions into the King Abdullah Canal. After destroying the initiated dam during the war in 1969, Israel flew a raid against Jordanian water facilities, as retaliation for the repeated infiltration of Palestinian 'fedayn' from the Kingdom's territory. This was the prelude to expulsion of the PLO by the Jordanian Army in the "Black September" 1970. Israel subsequently impeded, at repeated occasions, the neighboring state in accomplishing maintenance works at the intake of the King Abdullah Canal. Until recently, Israel has vetoed the World Bank financing a joint Jordanian-Syrian dam at Makarin. In the 1970s Israel itself began to divert greater amounts of Yarmouk water into Lake Tiberias. According to the estimations of several independent experts, these extractions raised up to 100 mcm in the mid-1980s. Later, these Israeli extractions seem to have been reduced during the years of drought between 1987 and 1991. In the Israel-Jordan peace negotiations, 70 mcm were assumed to have been the long-term average Israeli extractions from the Yarmouk. This is still considerably more than the 25 mcm foreseen in the Johnston Plan. Because of this, and due to the increase of Syrian diversions on the upstream tributaries, the Jordanian quota on the Yarmouk remained restricted to just 120-130 mcm yearly. This is three times less than the allocation expected in 1955 [12].

A last source of some importance to Israeli-Jordanian relations are the groundwater resources of the Arava Valley extending from south of the Dead Sea to the Gulf of Aqaba on both sides of the international boundary. This area is very arid, with precipitations below 50 mm per year. The only water available can be found in subterranean basins, some of which are common to Israel and Jordan. Both countries have been implementing a variety of agricultural schemes on their respective sides of the border. Since there has been no coordination of activities, pumping was competitive, resulting in rapid depletion of the supplies and their increasing salinization.

The water-sharing dispute is in part related to territorial controversies concerning some small plots of land which Israel conquered in the first Arab-Israeli War of 1948. Israeli farmers have been cultivating the land and using the wells located on it. However, the water amounts in question are limited. So far, Israel and Jordan seem to have been utilizing 8 and 4 mcm respectively from these sources. Thus, neither party perceives these supplies to be nearly as significant as the waters from the Jordan-Yarmouk system. At the beginning of the peace negotiations, the Jordanian demand for redistribution of the regional water resources belonged to the most important contentious in the bilateral relations with Israel. Jordan criticized the uneven allocation, as it had emerged from unequal geographical chances to tap the rivers and the power ratio between the two countries. Israel's extractions from the Yarmouk, and its obstructionism against Jordan building its own long-aspired dam on the same river were viewed as a violation of Jordan's vital interest. In 1990, at the peak of the drought period, when disputes rose over water allocations on the Yarmouk, King Hussein stated in an interview that water was the only reason that could again bring Jordan to war with. In its argumentation, Jordan used to bring up the Johnston Plan, which, although not legally binding, had been the only existing point of reference for agreed water sharing in the region. Israeli authors, in their turn, argued that Johnston's stipulations could no longer be taken as a basis for a settlement, since the Arab League rejected the plan at the time, and because the geopolitical situation had changed substantially since then. Moreover, through Israel's territorial gains in the Six Days War its water entitlements were also supposed to have risen.

The Israeli-Jordan Common Agenda of September 1993, aimed at defining the path for further talks, highlighted the paramount importance given to the water issue. Article 3 of the Common Agenda explicitly names "securing the rightful water shares of the two sides" as one of four main components to be dealt with in the negotiations. This put the water problem on the same level with security issues, as well as the question of Palestinian refugees and minor border and territorial matters

The Israeli-Jordanian water dispute concerned allocation quotas and the building of storage and diversion facilities on a shared river basin. Thus it was basically a distribution conflict, showing all the characteristics of a zero-sum game. On the other hand, the bilateral Israeli-Jordanian water dispute was the only one in the Arab-Israeli frame not directly interwoven with border or other highly politicized disputes. Historically, the Israeli-Jordanian relationship has been the least tense among all the relations between the Jewish State and its direct neighbors except Egypt. Since 1988, when King Hussein of Jordan officially gave up his claims to the West Bank in favor of a Palestinian solution, no territorial differences remained between the two countries except a few small lots of land in the Arava Valley and in the very north of the common border. But these areas neither represented a vital issue for the two sides nor did they imply control of or entitlement to critical water sources. The hydrological disputes between the two countries could therefore be regarded, at least since 1988, as a genuine water conflict. Although the conflict was long-standing and concerned considerable amounts of

water in a context of severe scarcity in both countries, it did not commingle with other strategic interests. Within the frame of comprehensive bilateral peace negotiations, the water issue could be addressed and finally resolved as such, free from extraneous concerns [13].

4.2 Israeli-Jordan Treaty of Peace

In 1994, Israel and Jordan signed off a Treaty of Peace. In article 6, a final settlement of all the water problems between the two countries was achieved and it includes the following resolutions:

1. The Parties agree mutually to recognize the rightful allocations of both of them in Jordan River and Yarmouk River waters and Arab Arava ground water in accordance with the agreed acceptable principles, quantities and quality, which shall be fully respected and complied with.
2. The Parties, recognizing the necessity to find a practical, just and agreed solution to their water problems and with the view that the subject of water can form the basis for the advancement of cooperation between them, jointly undertake to ensure that the management and development of their water resources do not, in any way, harm the water resources of the other Party.
3. The Parties recognize that their water resources are not sufficient to meet their needs. More water should be supplied for their use through various methods, including projects of regional and international co-operation.
4. The co-operation in water-related subjects would be to the benefit of both Parties, and will help alleviate their water shortages. The parties agree to search for ways to alleviate water shortages and to co-operate in the following fields:
    a. Developing the existing water resources and increasing the water availability including cooperation on a regional basis as appropriate, and minimizing wastage of water resources through the chain of their uses;
    b. Preventing the contamination of water resources;
    c. Mutual assistance in the alleviation of water shortages;
    d. Transfer of information and carry out joint research and development in water-related subjects.

4.3 The Israeli-Syrian Water Conflict

From an Israeli point of view, a return to the hydro political situation before 1967 on the northern border with Syria seems highly undesirable, at least in the present climate of mutual fear and mistrust. After a shift in the overall strategic situation in the wake of the collapse of the Soviet Union and Iraq's defeat in the Second Gulf War, water even seems to have gained in weight over traditional, strictly military concerns. The Israel occupation of the Golan Heights is not only a concern of defense of the Galilee but a need to protect the sources of the water. Israel proposes to realize water-related security needs by territorial adjustments which would incorporate the escarpment surrounding Lake Tiberias and the sources of the Banias into Israeli territory. These proposals are based on a 1991 report commissioned by the earlier Israeli government and conducted by Jehoshua Schwarz and Aaron Zohar under the auspices of the Jaffee Centre for Strategic Studies.

Interestingly enough, Israel hydro-political concerns are a more decisive reason for territorial claims than traditional military security issues. Basically, the defense requirements can be implemented by phasing the withdrawal in different stages, retaining a few early-warning posts, and establishing demilitarized areas on both sides of the border. They do not necessarily require territorial adjustments. It is fair to assume that when representatives of the Israeli government insist on territorial compromises on the Golan, water is of critical importance for them, too.

The question is related to water since the areas in question cross the Jordan River in one section and represent parts of the shores of Lake Tiberias in another. By extending its sovereignty over the formerly demilitarized zones, Syria could demand part of the water rights to the lake and/or obstruct Israeli diversions. However, legally and politically, it seems unlikely that the outcome of negotiations could be Israel's release of all the territories it conquered in the 1967 war, while Syria would be allowed to retain those territories. Judging on this basis, the struggle over the headwaters of the Jordan River cannot be regarded as a genuine water conflict as in the case of Israeli-Jordanian dispute. This is emphasized by the fact that the resources in question are not of the same importance for the three parties involved. From an Israeli point of view, water originating on the Golan Heights and Southern Lebanon represents more than 50% of the supply feeding the Upper Jordan River and Lake Tiberias, Israel's main water provider. On the other hand, these sources potentially represent no more than a few percent of the total water supply in Syria and Lebanon. For these two countries the streams might be of local but not national importance, since both are crossed by far more important rivers. As stated, the project to divert the Jordan's headwaters in the 1960s was motivated politically and not economically. Consequently, water disputes must be regarded as part of the security dilemma in this trail of the Middle East peace negotiations. As long as the political differences and the climate of mistrust between the parties persist, water will be perceived as a potential 'weapon'. In turn, territorial claims resulting from that perception complicate a resolution of the conflict's political core issues. In a hypothetical context of comprehensive peace and trust, water would lose that strong security connotation. In such a situation, the hydro-political goals, which Israel now pursues by retaining territory, could also be achieved by legal agreements. An arrangement would have to allocate a small portion of the water to the local population on the Golan and in Southern Lebanon while the bulk of the flow ought to remain Israel's property.

4.4 The Israeli-Lebanese Water Conflict

Somewhat different from the question of the Jordan River's headwaters is the issue of the Litani River which plays a certain role in Israeli-Lebanese relations. The Litani is a stream flowing entirely within the territory of Lebanon, with no connection to the Jordan River watershed. However, there has been a long-lasting interest by Zionist and later Israeli politicians in the waters of this river dating back to the beginning of the century when the first plans to found a Jewish home in Palestine were born. At the Paris Conference marking the end of World War I, the Zionist World Organization proposed to include the lower course of the Litani into the British Palestine Mandate. Later, Israel tried to include the Litani waters into the Johnston negotiations over a regional water-sharing regime. The Israeli invasion of Southern Lebanon in 1982 and the permanent occupation of a strip of land including a bit of the lower course of the Litani after its partial withdrawal in 1985, raised new fears about the projects that would divert the Litani waters southwards. Lebanese newspapers and politicians repeatedly accused Israel of working on a diversion scheme or even having already begun to extract water. These accusations have always been rejected by Israel. Past interest in the Litani is acknowledged, but present occupation of the "South Lebanese Security Zone" is justified by military defense concerns alone. It is true that after the invasion of 1982, Israeli army engineers seized all hydrologic charts and technical documents about the Litani and its hydroelectric installations. Israel's former Technology Minister Neeman also confirmed in an interview that seismic soundings and surveys had been undertaken near the Litani's western bend, most likely to determine the optimum route for a diversion tunnel. But best evidence indicates that there have been no Israeli withdrawals from the Litani River to date, except for supply of stationed troops, nor construction of infrastructure to support such a withdrawal. Several times UNIFIL officers, stationed in the zone, were commissioned to check those allegations, but always denied them. Moreover, the flow of the Litani has been diminishing in its lower course in the last decades due to Lebanese diversions upstream, both for irrigation and power generation. The remaining usable flow amounts to no more than 125 mcm, thus diminishing Israeli interest in a great diversion scheme. On the other hand, the idea of increasing Israel's water supply by importing water from the Litani has not been put. Several Israeli experts continue to propose diverting the remaining Litani waters to the south as a means of alleviating water scarcity in Israel. It seems, unlikely however, that Israel would attempt a unilateral diversion of the Litani without an explicit agreement. Rather, Israel may try to put water deliveries on a commercial basis on the agenda of Israeli-Lebanese negotiations as one condition for a troop withdrawal. According to what former Lebanese Foreign Minister Elie Sale told his parliament, back in 1982-1983, during Israeli-Lebanese negotiations on a partial troop withdrawal, Israel seems to have informally demanded buying water and leasing land. Yet the issue was not resolved, and could be raised again when current peace negotiations between the two countries reach an operational stage.

4.5 The Israeli-Palestinian Water Conflict

Israel, including its settlers, is presently utilizing nearly 80% of the shared waters of the West Bank, while Palestinians are left with less than 20%. To compound the inequity, Palestinians on the West Bank are forced to pay higher rates for their water supply [14, 15].

Palestinians have ever objected to the increasing control and integration of the West Bank water resources into the Israeli grid. Legal arguments by the Palestinians often refer to Hague Regulations of 1907 and the Fourth Geneva Convention of 1949 on the powers and duties of a belligerent occupier. These international treaties forbid an occupier to transfer its civilian population into occupied territory. Moreover, they place severe restrictions on the occupier's right to exploit both private and public property, such as land and natural resources for the purposes other than the occupation itself. Thus a permanent extension for Jewish settlements and their supply with local water resources at the expense of the indigenous population is seen as a flagrant breach of recognized international norms. Nationalization of all water resources is regarded as a confiscation of private property, which also infringes upon the conventions, since under previous Jordanian rule water rights were often related to land ownership.

The Israeli government claims that, by occupying the West Bank and Gaza Strip in 1967, it has not displaced a legitimate sovereign, since Jordan and Egypt themselves illegally occupied these territories in 1948. Hence, the West Bank and Gaza Strip are not seen as territories falling under jurisdiction of the signatories of Hague and Geneva Conventions. Following this argumentation the territories captured from Jordan and Egypt in 1967 are officially not referred to as "occupied", but just as "administered" by Israel. In the last resort, this very finicky legal argument views the West Bank and Gaza Strip as a sort of no man's land where universally accepted rules of international law do not fully apply. Israel's argumentative standing is somewhat stronger regarding water use from within Israeli territory proper. Here, it argues that water is not being exported from the Occupied Territories but rather flows naturally seaward. Because Israel tapped most of the water even before the Six Days War, it feels it has "prior appropriation rights". However, according to international customary law, the right of prior use is just one among several criteria to be taken into account in distributing international water bodies.

A further water dispute between Israel and the Palestinians concerns the Palestinian claim on a share of the Jordan River. The Palestinians are now totally excluded from using the river, though the West Bank is a full riparian for a length of about 60 kilometers and even takes its name because of its location relative to it. According to informal provisions in the Johnston negotiations of 1955, 70-150 mcm of Jordan-Yarmouk

waters were supposed to be used on the West Bank. They made up part of the Kingdom of Jordan's share.

In the Gaza Strip, the hydro-political situation is the opposite of that on the West Bank. Since the Gaza aquifer is in part recharged by water inflows from the adjacent Israeli territory, replenishment depends on Israeli behavior. Palestinian sources claim that, due to groundwater extraction by Israeli wells near the border and construction of low dams upstream in Wadi Gaza, Israel is diminishing the natural recharge of the aquifer. In fact, while settlers on the West Bank are able to irrigate nearly 70% of their cultivated land.

In a first view, the Israeli-Palestinian water dispute seems to be a classic distribution conflict over shared resources of vital importance to both sides. From the Israeli perspective, one-quarter of the country's present water supply and an even greater part of its drinking water is tapped from the aquifer underlying the West Bank and the adjacent Israeli territory. Westward-flowing underground water also helps stabilize pressure and prevent Mediterranean water from intruding into Israel's own coastal aquifer. Limiting Palestinian consumption is therefore viewed by Israeli authorities as a defensive measure. Israel has been tapping 270 mcm/year of the aquifer from its side of the Green Line since 1955. The fear is that any uncontrolled, extensive groundwater development by Palestinians on the West Bank would threaten the yield of Israel's own wells. Moreover, inappropriate management of the shared aquifer might lead to irreversible damage by pollution and/or salinization. The Palestinians object that the increasing control and integration of the Occupied Territories' water resources into the Israeli grid is done at their expense. They claim that more than 90% of the flow of the Western aquifer and 100% of the Northeastern one are fed by rainfall over the West Bank. Thus water should primarily be allocated for their use.

Unlike the Israeli-Jordanian case, for instance, the chances to use common water resources are therefore not determined by a mixture of geographical factors and power ratio, as in normal international basins, but by political circumstances alone. Despite being lower riparian of the Mountain Aquifer, through its military occupation of the West Bank, Israel is in the position to deliberately fix the use quota of its competitor, the Palestinians. Thus, the geographical setting is completely distorted. Given this situation, the dispute over water is intrinsically embedded into the struggle over land and national identity at the core of the Palestine question. Speaking about the ongoing peace negotiations aimed at finding a solution to the Israeli-Palestinian conflict, water directly touches all political and territorial main issues in question.

5. Conclusions

This paper discussed the water problems in the Middle East from a geopolitical perspective. It examined the politics that revolve around the water wealth in the Middle East and how they affect the peace process in the region. Moreover, it discussed the various international laws that have proven to be a key factor in determining the rights and duties of the riparian states for sharing water of rivers passing through them. Similarly, the Arab-Israeli conflicts on matters of water were tackled showing how clashing parties can reach a common ground that allow them to share the water resources in a fair manner and according to the international and legislative laws. This may open the door for resuming the reconciliation dialogue and the peace negotiation between Israel and the Arab countries in an attempt to find a final solution to the Arab-Israeli wars, and relieve the stress and the struggle over regional and national issues of which water has a big share.

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