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HYDRO-HEGEMONY IN ACTION: THE PROBLEM OF WATER IN THE ISRAEL-PALESTINIAN CONFLICT

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Abstract: The Israeli-Palestinian conflict has a long history. In this multilayered conflict, water has its own crucial role leading to the manifestation of hydro-hegemony. Access to adequate water resources has effectively perpetuated the Israeli-Palestinian conflict and continues to hinder any effort to establish a lasting peace between the two parties. Therefore, this article aims to reveal the reason behind the importance of water and the factors that lead to hydro-hegemony. It demonstrates that water is a highly politicized component of this conflict and serves as a tool for Israel to oppress and dominate Palestinians. However, it is important to note that all this is the result of the asymmetrical power distribution between the parties and the continuous efforts of one side to control the other.

Keywords: *hydro-hegemony, water issue, Israel, the Occupied Palestinian Territories, West Bank, Gaza, conflict.*

Introduction

In 2013, the United Nations reported that the Occupied Palestinian Territories (OPTs), particularly the Gaza Strip, will be uninhabitable by 2020. The main reason for this statement was the severe shortage of water in the region, as well as the excessive pollution, both of which had a devastating impact on health, agriculture and the overall vitality of the region.

A series of analyses have attempted to find the real cause of all this that has had such devastating consequences. There are indications that it is the result of deliberate Israeli actions. However, the questions of how water has become a part of the Israeli-Palestinian conflict, what its role is in the conflict's development and how Israel uses water to achieve its political goals remain open. There are arguments that all this is not only the result of Israel's unilateral actions but also the direct consequence of the water scarcity of the region. It is the most water-scarce region of the

Middle East, where 5% of the world's population lives and has less than 1% of the water resources.[1]

The water dispute between Israel and Palestine is not merely an environmental conflict. From the beginning, the Israeli-Palestinian conflict was mainly over the two different nations' aspirations for self-determination and territorial sovereignty over the same area. Gradually, the dispute began incorporating other spectra as well. Thus, it is a many-fold dispute and is intertwined with history, ideological beliefs, topographic differences, as well as asymmetrical power relationships between them. First, some of the turning points connected with the problem of water will be chronologically presented in this article for a more comprehensive and profound understanding of the conflict. Then, water-related issues both considering regional circumstances and specific to the Israeli-Palestinian conflict will be discussed.

As mentioned above, this article seeks to reveal the role and importance of water in the Israeli-Palestinian conflict and to find an explanation for Israel's deliberate actions. Thus, after discussing the literature and the current main theories concerning the water issue in Israeli-Palestinian relations, the concept of hydro-hegemony will be debunked, as many scholars have determined that the reason for these actions is nothing more than an uneven distribution of power.

Historical Background

The Era of Zionist Aspirations and the Evolution of the Israeli-Palestinian Conflict

For decades, Arabs and Jews have struggled to live and control the area between the Jordan River and the Mediterranean Sea. At the end of the 19th century, modern political Zionism emerged. In the core of Zionist ideology, Palestine was viewed as a territory reserved for Jews, *'a land without people for a people without land'*.[2] This was the main reason that after the emergence of political Zionism, illegal large-scale immigration waves (*aliyahs*) to Palestine began with great speed.

Irrigation was necessary for Jews to fertilize the Palestinian lands. It was also important for other countries in the region. Hence, the

[1]Oded Eran, INSS, Gidon Bromberg and Giulia Giordano, *Israeli Water Diplomacy and National Security Concerns,* (Tel Aviv: EcoPeace Middle East, 2018): 5, http://ecopeaceme.org/wp-content/uploads/2018/01/Water_Diplomacy.pdf (accessed May 15, 2019).

[2]Alan George, ""Making the Desert Bloom": A Myth Examined," *Journal of Palestine Studies* 8, no. 2 (1979): 88.

attempts to change the flow of the Jordan River Basin and use it for their own interests were noticeable by the riparian states. For this purpose, several projects have been put forward by the third parties (Britain, the US) for sharing the basin among the riparian states and ensuring unified management of the Basin.[3] However, it should be pointed out that none of these plans have been entirely implemented, leading to conflict among them over the water resources of the region.

1948-1967: The Failure of Unified Management of the Jordan River Basin

The year 1948 was decisive, as the state of Israel was founded on the basis of *'most of the British mandate Palestine'*[4] by the UN General Assembly Resolution 181.[5]The following period from 1948-1967 was strained and crucial in Israeli-Palestinian relations, regarding the hydropolitical relations between them and among Arab states as well. Tense relations with their Arab neighbors continued and the failure to manage the Jordan River Basin cooperatively reinforced its unilateral development of it by separate riparian countries. Israel began building the National Water Carrier (NWC) in 1953 to divert water from the Sea of Galilee to the highly populated parts of the country, reaching even as far as the Negev. Despite the resistance from the neighboring riparian countries, Israel completed the construction of the NWC in 1964, starting from the north-western shore of Lake Tiberias.

To counteract the Israeli unilateral actions towards the diversion of the headwater of the Jordan River, Jordan and Syria proposed their own diversion plan. In such a water-related hostile environment, when each side strived to utilize the river for its own purposes, Israel's retaliation was not late, and it started to attack these projects by investing in extensive military potential and by launching large-scale air strikes in the direction of Syria. This, along with a number of other factors, reached its tipping point and lead to the Six Day War of 1967.

1967-1993: The era of Israel's Domination

The Six-Day War was a turning point in the Middle East, which completely changed not only the political map of the region but also the hydropolitical map. The Israeli-Syrian border clashes, including the

[3]Arnon Soffer, *Rivers of Fire: The Conflict Over Water in the Middle East* (Oxford: Rowman & Littlefield, 1999).
[4] Mark Zeitoun, *Power and Water in the Middle East: The Hidden Politics of the Palestinian-Israeli Water Conflict* (London: I.B. Tauris & Co Ltd, 2008), 66.
[5] William L. Cleveland and Martin Bunton, *A History of the Modern Middle East* (Boulder: Westview Press, 2013).

clashes over water regarding the Sea of Galilee, were one of the main incentives for the war, which was waiting for a timely spark[6]. As a result, the achievements and losses were significant in terms of hydropolitics among the riparian states and the tendency of the competitive unilateral utilization of the Basin intensified. Capturing the Golan Heights, the West Bank, and Jerusalem, as well as the Sinai Peninsula,[7] Israel controlled both the Upper Jordan River and the Lower Jordan River, as well as the Western, North Eastern and Eastern Aquifer Basins. The balance of power completely changed during the Six-Day War, more like the relationship between an occupier and the occupied. From 1967-1993, there were several other significant political events which created favorable conditions for strengthening Israeli domination and worsening the Palestinians' situation in the occupied territories and outside.

1993-present: Alleged Cooperation?

The 1990s were marked by the commencement of the peace process between Israel and Palestine (launched in Madrid in October 1991)[8]. In parallel with the peace process, bilateral agreements were signed between Israel and Jordan on the one hand, and Israel and Palestine on the other. However, no multilateral agreement was signed between the neighboring riparian states, and even these bilateral agreements were often violated, especially during political or natural crises.

In 1993, the Government of Israel and the PLO signed the *'Declaration of Principles on Interim Self-Government Arrangements'* (Oslo I Accord) to prevent the exploitation of land and water resources by Israel in the West Bank and the Gaza Strip. The Declaration called for Palestinian self-government in the West Bank and Gaza, the withdrawal of the Israeli military from these territories, as well as the creation of the Palestinian Land and Water Authorities, in order to cooperate over the management of water resources.

From 1993-1995 period, the two sides sought to broaden the spectrum of cooperation, and, in 1995, the *'Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip'* (Oslo II Accord) was signed. Although the water issue was not resolved by this agreement, a number of compromises were made, including recognizing the

[6] Moshe Gat, "The Great Powers and the Water Dispute in the Middle East: A Prelude to the Six Day War," *Middle Eastern Studies* 41, no. 6 (2005): 911-935.
[7] Caplan, *The Israel-Palestine Conflict*.
[8] Ibid.

Palestinian water rights, and a joint administrative body was created, the Joint Water Committee (JWC), to coordinate the management of water resources.[9]

By the Oslo II Accord, the territory of the West Bank was divided into three areas: Area A, 18% of the West Bank, entirely under the Palestinian supervision; Area B, 21% of the territory of the West Bank, where the administrative control was given to Palestine, whereas the security of the territory was ensured by the Israeli military; and finally, Area C, 61% of the West Bank, including the rest of the non-intermittent part of the West Bank, under Israeli control both in terms of administrative and security supervision.[10] Moreover, the territory of the Jordan Valley also fell under these three divisions: Areas A, B and C. Areas A and B consisted of only 8.4% of the Valley, and Area C consisted of the rest of the Valley, where any Palestinian action (the construction of wells, dams, etc.) was prohibited. It is noteworthy to mention that Area C was mainly comprised of agricultural fertile lands with abundant natural resources.[11]

So far, the Israeli-Palestinian relations are strained and every attempt to resolve the conflict, including water related issues, has failed.

Water Scarcity and Water Security

A series of studies indicate that water scarcity and the resulting discrepancies can render conflict between states more likely. Thomas-Homer Dixon is one of the first scholars who has attempted to shed light on the link between resource, particularly water scarcity, and conflict. He hypothesizes the fact that there is a significant causation between resource scarcity and conflict, and that this environmental scarcity inevitably leads to protracted conflict.[12]

Given the permanent water problem in the Middle East, mainly due to its arid climate, water scarcity has its impact on the regional security dynamics, and for some regional countries, it is nothing more than an issue of survival.[13] Furthermore, in the Middle East, where intrastate and inter-state hostilities are endemic, the management of water resources is

[9] Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip of 1995.
[10]Cleveland and Bunton, *A History of the Modern Middle East*.
[11] Eran Feitelson, "The Ebb and Flow of Arab-Israeli Water Conflicts: Are Past Confrontations Likely to Resurface?," *Water Policy* 2, no. 4-5 (2000): 343-363.
[12] Thomas Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security* 19, no. 1 (1994): 5-40.
[13] Jan Selby, "The Geopolitics of Water in the Middle East: Fantasies and Realities," *Third World Quarterly* 26, no. 2 (2005): 329-349.

inclined to become a *'political weapon'* in the hands of the states. In this case, the scarcity of water may be not only because of the arid climate in the region but also the result of deliberate and intentional actions of the states.[14]

The Israeli-Palestinian conflict completely fits in this context. In addition to regional water scarcity, water serves as a *'political weapon'* for Israel to achieve its political goals and to dominate the Palestinians. The question of how Israel uses water to serve its political goals will be discussed later in the text. However, now it is worth mentioning that water scarcity played a decisive role in determining the security-related policies of both countries. The natural scarcity of water, coupled with population growth, climate change, as well as other socio-economic and political factors also contribute to the exacerbation of the conflict.

The Symbolism of Water

Some researchers have tried to emphasize the direct linkage of both Israeli and Palestinian aspirations towards water with the correlation of religious and Zionist ideology on the one hand, and cultural norms, on the other. It is worth mentioning the significance and vital nature of water as a natural resource which is noted both in the Quran (the holy book of Islam) and Sharia (Islamic religious law), as well as in the Tanakh or Old Testament (Hebrew Bible) and Halakhah (Jewish law).

Significantly, in the Old Testament, the word 'water' (*mayim* - מַיִם) is mentioned about 580 times, while the indirect applications of the word, such as rivers, rain, wells, are larger in number.[15] For Jews, water has been connected to heaven as a means of spiritual purification and cleansing given by God's grace. The connection expressed in the Hebrew language, where the word for heaven is 'shamayim' (שמים), composed of the words sham (שמ) and mayim (מַיִם), literally"source of water," is also significant.

In the Bible, Jews are presented as farmers and their primary duty is to fertilize the infertile land or the desert. Hence, agriculture and farming have deep roots in the Bible. Given modern Zionist ideology's reference to the Old Testament, water, irrigation, and agriculture have retained their importance for modern Jews as well. Respectively, modern

[14]James A. Winnefeld and Mary E. Morris, *Where Environmental Concerns and Security Strategies Meet: Green Conflict in Asia and the Middle East* (Santa Monica, CA: Rand, 1994).
[15]Hillel, *Rivers of Eden.*

Zionist ideology, as the foundation of the Israeli state within the territory of Palestine, has greatly influenced Israel's policies aimed at agriculture and water development.[16]

Wessels notes that the aspirations of the State of Israel to control water resources also have political motives. The early Jewish authorities strove to cultivate the land so that in the future the transmission of land to Arabs would become difficult or even impossible. Thus, the cultivation and the transformation of the land were vital for the security of the newly emerging state.[17]

In addition, as Jews were accustomed to living in more water-abundant places previously, immigrating to the Levant's harsh conditions was difficult for them to adapt to. Thus, at any cost, they sought to transform the land by promoting agriculture and planting lush vegetation. Over time, all these became the inseparable part of their unity and national identity in general.[18]

According to Arab culture, the Arabs have come from the desert, and for them is also of vital importance. This is one of the reasons why water is one of the major themes in the Quran. Although the Quran is shorter than the Bible, the word 'water' (*ma'* - ماء) occurs about 60 times, in addition to numerous indirect applications of it (rivers, seas, rain, fountains, etc.).[19]

Expressions such as *"all living things (organisms) are made from water"* alike, (Surah Al-Abnya 21:30) are often repeated in the Quran, which indicates the symbolism of water as the beginning of life. According to the Quran, the Throne of Allah is also on the waters (Surah 11:9), from where he sends rain to the earth, to human beings, for sowing seeds and growing crops (Surah 32:27). It is also stated that water is a gift or mercy from Allah, and therefore it should be honored and respected (Surah 15:22).

Likewise, for Palestinians, water is an essential tool for agriculture. Prior to the foundation of the Israeli state in the Palestinian territories, the Palestinian population was mainly engaged in agriculture, and farming

[16] Clive Lipchin, "Water, Agriculture and Zionism: Exploring the Interface Between Policy and Ideology," in *Integrated Water Resources Management and Security in the Middle East,* ed. Lipchin et al. (Dordrecht: Springer, 2007), 251-267.
[17] Josepha Ivanka Wessels, ""Playing the Game", Identity and Perception-of-the-other in Water Cooperation in the Jordan River Basin," *Hydrological Sciences Journal* 61, no. 7 (2016): 1323-1337.
[18] Ibid.
[19] Hillel, *Rivers of Eden.*

was their way of living. Water was needed to care for their basic needs properly. Hence, they prayed and dedicated songs and rituals on the water. Indeed, water had a vital role for the survival of the Palestinians.[20] However, as the Israeli-Palestinian conflict erupted, water acquired a more symbolic significance for the Palestinians with the connotation of dominance over them and Israel's continuous *'theft'* of water. This will be discussed later in the text.

Water as a Tool of Domination

The role of water in the Israeli-Palestinian conflict should be viewed not only as a chemical element or a natural resource, but it should be also examined to reveal the various interests of stakeholders on water resources. This means that the water issue in the Israeli-Palestinian conflict has both natural-geographical and political prerequisites. A large number of researchers mention the idea that '*water shortages are not so much a function of nature as of politics*' in Israeli-Palestinian relations[21] and that Israel uses water as an instrument to dominate and discriminate against Palestinians. Going further, some authors describe Israel's unilateral actions towards Palestinians as '*water Nakba*' (disaster, catastrophe).[22]

The Six-Day War of 1967 and the occupation of the West Bank, the Gaza Strip, and the Golan Heights, completely changed the course of the conflict. As a result, the main players contending for control of natural resources changed. Israel controlled all of the water resources in historic Palestine, including the surface water in the West Bank, and the aquifers in both the West Bank and the Gaza Strip.

Control was followed by pressure from Israel. In addition to political and economic pressures, Israel's repressive actions also manifested themselves in the social, legal, and all aspects of the Palestinians' lives. The use of military force by the Israeli authorities further aggravated the situation and gave Israel the opportunity to freely formulate its policies towards the use and exploitation of water resources. As a result, these policies were accompanied by the prohibition of

[20] Miriam R. Lowi, *Water and Power: The Politics of a Scarce Resource in the Jordan River Basin* (Cambridge: Cambridge University Press, 1995).
[21] Ralph H. Salmi, "Water, the Red Line: The Independence of Palestinian and Israeli Water Resources," *Studies in Conflict and Terrorism* 20, no. 1 (1997): 51.
[22] Zayneb al-Shalalfeh, Fiona Napier and Eurig Scandrett, "Water Nakba in Palestine: Sustainable Development Goal 6 versus Israeli Hydro-hegemony," *Local Environment* 23, no. 1 (2017): 117-124.

Palestinians from accessing water, and they were allowed only use water *'for the bare minimum of domestic requirements'*.[23]

According to the review of the literature, the following groups of Israeli discriminatory policies in the OPTs can be identified: the application of military orders, strong control over drilling new wells or pumping, water prices, violations of agreements and their irreversible consequences on agriculture, health, and the conflict as a whole.

First, about 2.000 Israeli military orders and proclamations issued mainly after the Six-Day War included explicit discriminatory elements and absolute control over water resources.[24] They defined that all the water resources of the occupied territories should be state-property and subject to the absolute control of Israeli authorities. These military orders also defined the development of water resources by Israel.[25]

Second, Israel's discriminatory actions are displayed by rigid control over drilling new wells and pumping more water, as well as the prohibition of the construction of distribution reservoirs. These restrictions are aimed at allowing most of the groundwater resources to serve Israeli residents and settlers.[26] Occasionally, Israeli wells are being drilled so close to the Palestinian wells and so deep, that the groundwater is being fully utilized by Israeli settlements. Moreover, restrictions are also imposed on the maintenance and repair of Palestinian wells and pipes, which often lead to the accumulation of sludge within the pipes, wearing them out. Any renovation required Israel's permission.

The situation is different in the case of Israel, as it is allowed digging wells to 400-600 meters, while in case of Palestine they cannot exceed 60-110 meters. Using advanced technologies in the pumping, Israeli water policies are more efficient and largely surpass Palestinian pumping and water management as a whole.[27]

Third, the imbalance of power is also reflected in the price of water. Unlike Israel, where the Ministry of Agriculture defines water prices, this function is given to the Israeli Civil Administration for

[23] Salmi, "Water, the Red Line," 37.
[24]Jad E. Isaac and Jane Hilal, "Palestinian Landscape and the Israeli-Palestinian Conflict," *International Journal of Environmental Studies* 68, no. 4 (2011): 413-429.
[25] World Bank, 2009, *Assessment of Restrictions on Palestinian Water Sector Development*. Washington, DC, USA: The World Bank Publications, https://siteresources.worldbank.org/INTWESTBANKGAZA/Resources/WaterRestrictionsReport18Apr2009.pdf (accessed March 21, 2019).
[26] Amnesty International, 2009, *Troubled Waters: Palestinians Denied Fair Access to Water*. United Kingdom: International Secretariat, AI Publications.
[27] World Bank, 2009, *Assessment of Restrictions.*

Palestinians, which is the main Israeli governing body in the West Bank and subordinate to the Israeli military. It is established that the Palestinians should pay for the full cost of water, and Israeli settlers are entitled to the subsidized water prices of the World Zionist Organization (WZO).[28]

Fourth, a number of researchers have also discussed the water issue in the Israeli-Palestinian conflict in terms of the violation of some international laws (International Water Law; the Hague Regulations of 1907; the Fourth Geneva Convention of 1949; the United Nations Security Council (UNSC) Resolutions 446, 465; the United Nations General Assembly (UNGA) Resolutions 1803 (XVII), 3171 (XXVIII), etc).

The review of the literature shows that the severe consequences of Israel's discriminatory agricultural policies are enormous. According to Selby, any step or initiative in the field of agricultural production, irrigation, or specific crop cultivation requires the permission of the Israeli authorities through licenses or quotas.[29] Since agriculture is the cornerstone of the Palestinian economy, it has a significant impact on the livelihood of the population. Overall, a limited amount of water, along with land confiscation and the Israeli government's restrictions in the agricultural sector greatly hinder Palestinian agricultural production.

Continuous land confiscation by Israeli settlers contributes to the deteriorating situation of water. Israel's unilateral policies and the exclusive opportunities given to the settlers lead to numerous encroachments on the Palestinian population's rights. Schiff and Ya'Ari argue that Israel's actions are nothing more than pure *'theft'* of water from the residents.[30] The reason behind these actions of Israel underlined in the literature is sometimes linked to a larger project aimed at the *'collective punishment'* of Palestinians,[31] by driving them out and ultimately ethnically cleansing the region.[32]

Almost the same problems related to water can be found in the Gaza Strip. It can even be said that the situation is even worse, which is mainly due to the arid climate, lack of water resources in general, the Israeli blockade on all sides and its deliberate actions against the population, as well as the unprecedented population growth in the Gaza Strip.

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[28] Ibid.
[29] Selby, "The Geopolitics of Water in the Middle East," 121-138.
[30] Zeev Schiff and Ehud Ya'Ari, *Intifada: The Palestinian Uprising – Israel's Third Front* (New York, 1990).
[31] Salmi, "Water, the Red Line," 15-65.
[32] Al-Shalalfeh, Napier and Scandrett, "Water Nakba in Palestine," 117-124.

In the Gaza Strip, water is contaminated with a variety of dangerous chemicals, fertilizers, chlorides, and nitrates. Such conditions are the cause of a number of diseases, such as kidney diseases, typhoid, giardia (sis), cholera and dysentery, as well as high rates of neonatal (deaths four weeks after birth) and infant mortality (deaths up to one year). Moreover, according to the UN OCHA report of 2013, 96% of the groundwater is not appropriate for human consumption. Non-appropriate sewage treatment facilities have led to the pollution of the Mediterranean Sea by Gaza. The contamination of the Sea harms the fishing industry of the Gaza Strip, which is the one of primary ways of living in Gaza, as approximately 35.000 people are engaged in it and make it their livelihood.[33]

The Water Issue from the Israeli Perspective

There is a lack of studies regarding Israeli perspective towards this issue, and there are few responses to the Palestinian allegations. Looking at the water issue in the Israeli-Palestinian conflict through the lens of realism, Godlewski argues that living in the anarchic world and having the primary purpose of survival often leads to security protection at any cost. The same applies to the Israeli case. As it is mainly surrounded by adversaries and is the only non-Arab state in the region, its primary goal is to maintain the security and balance of power of the region. Thus, it can be argued that Israel's continuous seizure of water and land are directly related to its goal of survival and security. Additionally, the displeasure coming from the occupied territories towards the Israeli continuous exploitation of land and resources increases Israel's objective of surviving in such a hostile environment.[34]

Besides, as Tal argues after the construction of the NWC, when Israel succeeded in developing its water policy to some extent by creating a water infrastructure and network system, there was a fear that the Arab neigboring countries could attack these systems (in other words they served as strategic targets for the Arab states), thus destroying Israel's water infrastructure and causing considerable damage to Israel's viability in general. This was another reason for Israel to strengthen its water

[33]UN OCHA, 2013, https://www.ochaopt.org/sites/default/files/ocha_opt_gaza_ara_factsheet_july_2013_english.pdf (accessed April 16, 2019).

[34] Andrew Godlewski, ""Damming" the Peace Process: Water Politics and its Impact on the Israeli-Palestinian Conflict," *Journal of Muslim Minority Affairs* 30, no. 2 (2010): 153-166.

system, develop it, and establish control of the new water resources, even in the OPTs.[35]

Methodology and Research Design

This article seeks to answer the following research questions:

– What is the role of water in the Israeli-Palestinian conflict and how does Israel use the water for achieving its political aspirations?

– Is the concept of hydro-hegemony applicable to Israeli-Palestinian water relations?

Accordingly, the hypotheses to be tested are the following:

– In the Israeli-Palestinian conflict, water plays an important role and it serves as a tool for Israel to discriminate against and oppress the Palestinians.

– Taking into consideration the asymmetrical power relationships in the Israeli-Palestinian conflict, Israel's actions can be best qualified as hydro-hegemonic.

To answer the foregoing questions, an exploratory research design was chosen. Furthermore, secondary data was collected and both qualitative and quantitative methods were applied. Theoretically, to answer the first question, the analysis heavily relied on the literature review. To verify the validity of the theories put forth and see the asymmetrical allocation of water resources, quantitative data was examined from the reports of the World Bank, the Palestinian Central Bureau of Statistics (PCBS), the Palestinian Water Authority (PWA), and the Israeli Water Authority (IWA). With regards to the official data released by Israel, it should be noted that they are limited, and sometimes they do not have access. To answer the second research question and to get more insight into the asymmetrical power distribution between the parties, a comparison of relative power was conducted.

Hydro-hegemony as a Conceptual Framework

Hydro-hegemony can be applied to this study as a useful conceptual framework. The concept has been developed and widely used by a number of researchers working with the London Water Research Group. Among them, the roles of Zeitoun and Warner are significant. They defined hydro-hegemony as *'hegemony at the river basin level,*

[35]Alon Tal, "The Evolution of Israeli Water Management: The Elusive Search for Environmental Security," in *Water Security in the Middle East: Essays in Scientific and Social Cooperation*, ed. Cahan (London: Anthem Press, an imprint of Wimbledon Publishing, 2017): 125-144.

achieved through water resource control strategies such as resource capture, integration and containment'.[36] Strategies can be in the form of pressure or coercion by applying hard power, different treaties, and agreements by applying bargaining or ideational powers, etc., which can be handily manipulated especially in weak institutional contexts.

Similarly, Wessels defines hydro-hegemony as a concept used in political science, as well as in international relations and water studies, which describes one or two powers having a hegemonic role over the control of water resources (*'power over'* dimension), and contrasts it to the equitable distribution and management of water between the riparian states. He associates it with the colonial mentality, when more militarized and powerful actors exploit natural resources by violating human rights and damage those who are directly dependent on these resources.[37]

It should be emphasized that many researchers attach great importance to the role of power in hegemonic actions and attribute such developments in Israeli-Palestinian relations to the asymmetrical distribution of power. For instance, trying to get deeper insight into the concept of hydro-hegemony, Zeitoun adopts three types of power[38] identified by the political and social theorist Steven Lukes, which are hard power, bargaining power, and ideational power.[39] The latter two can be considered as two dimensions of soft power developed by Joseph Nye. In other words, hard power is the ability to influence on others through force or coercion (mostly material power), which can be measured by the economic and military capabilities of the state or, in terms of geographical positioning, the state's favorable location (riparian position, namely upstream or downstream). On the contrary, bargaining and ideational powers can be achieved through attraction and/or persuasion (immaterial power),[40] which is difficult and sometimes impossible to measure. Going forward, it should be noted that a state or political entity is considered a hegemon when it is dominant in all three dimensions of power.

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[36] Mark Zeitoun and Jeroen Warner, "Hydro-hegemony – a Framework for Analysis of Trans-boundary Water Conflicts," *Water Policy 8* (2006): 435.
[37] Josepha Ivanka Wessels, "Challenging Hydro-hegemony: Hydro-politics and Local Resistance in the Golan Heights and the Palestinian Territories," *International Journal of Environmental Studies* 72, no. 4 (2015): 601-623.
[38] Zeitoun, *Power and Water in the Middle East.*
[39] Steven Lukes, "Power and the Battle for Hearts and Minds," *Millennium – Journal of International Studies 33*, no. 3 (2005): 477-493.
[40] Joseph Nye, *Soft power: The Means to Success in World Politics* (New York: Public Affairs, 2004).

In addition to asymmetrical power and hegemonic interaction, Zeitoun and Warner offer three pillars of hydro-hegemony, including riparian position (upstream/downstream), power (all three dimensions of power mentioned above), and exploitation potential (technical capacity). It is argued that if the state is in the upstream position, technically it has more water and can dam it, in this way preventing the flow of water into the downstream country. The second and third pillars of the framework of hydro-hegemony are crucial because even if the state is on the top of a river, if it does not have the sufficient amount of money to build dams and does not know how to build them, the upstream position will not help. Namely, the state does not just need favorable geography, but it also needs exploitation potential.[41]

All this becomes more complicated when talking about the environment, particularly natural resources, as it is fraught with risks and uncertainties (lack of conflict resolution mechanisms, distrust between riparian states, etc.). The rational management of transboundary natural resources requires cooperation between the parties, otherwise 'the tragedy of commons' may occur. In addition, political uncertainty entails the independent actions of the hegemon which are qualified as *'unilateral environmentalism'* in order '*to protect* [themselves] *unilaterally from transboundary spillover effects'*.[42] If there is a (political) conflict between the riparian states, the situation of 'environmental unilateralism' is exacerbated by leading to more independent actions and the unilateral framing of issues by the hegemon, as in the Israeli-Palestinian conflict.

Data Analysis

The Jordan River Basin

The Jordan River Basin, with an area of approximately 18.500 square kilometers and length of 250 kilometers, borders Jordan (40%), Israel (37%), Syria (10%), the West Bank (9%), and Lebanon (only 4%). The river originates from the convergence of three headwaters, the Dan River, the Banias River, and the Hasbani River, and their convergence point is located 5 km south of Israel's northern border. It joins Lake Tiberias, flowing through the Hula Valley. From Lake Tiberias the Lower Jordan River outflows and, joining the Yarmouk River, flows southward

[41]Zeitoun and Warner, "Hydro-hegemony – a Framework for Analysis of Trans-boundary Water Conflicts."

[42]Itay Fischhendler, Shlomi Dinar and David Katz, "The Politics of Unilateral Environmentalism: Cooperation and Conflict over Water Management along the Israeli-Palestinian Border," *Global Environmental Politics 11*, no. 1 (2011): 39

and borders Israel and the West Bank from the west, Jordan from the east, and flows into the Dead Sea. This region, starting from the spot of the convergence of the Yarmouk and Jordan Rivers and ending in the Dead Sea, is known as the Jordan Valley.[43]

The climate is mostly arid, and the average precipitation rate is 380 mm throughout the Jordan River Basin. Despite being arid, the most fertile land of the basin extends to the eastern and western banks of the Lower Jordan River, falling in the territories of Jordan and the West Bank, respectively.[44]

The main water resources in Israel and the OPTs are surface water, groundwater aquifers, and non-conventional water sources (e.g. reused wastewater). The Jordan River, which is the main surface water supply, is a relatively stable source of water and serves as the main source of supply for Israel. In addition, four aquifers are vital for Israel and the OPTs, including the Mountain or Western Aquifer, the North-eastern Aquifer, and the Eastern Aquifer in the West Bank, as well as the Coastal Aquifer in the Gaza Strip.[45]

As mentioned above, Israel is considered the main utilizer of the Jordan River, and due to its actions, a number of reports show that the flow of the Jordan River has declined over time, becoming 30 MCM/y from 1.400 MCM/y.[46]According to the PWA, the major cause of such a substantial decrease is the state of Israel itself and its NWC, as well as the dams that Israel constructs in the upper part of the river. Another problem is the runoff of untreated wastewater from Israeli settlers, which further complicates the utilization of the water. In addition to Israel's intentional acts, the flow of the river has decreased due to the climatic conditions of the region as a whole, which is the result of high evaporation rates of the region.[47]

[43]Lowi, *Water and Power.*
[44]World Bank, 2009, *Assessment of Restrictions.*
[45] The Palestinian Water Authority, 2013. *Status Report of Water Resources in the Occupied State of Palestine – 2012*, http://www.pwa.ps/userfiles/file/%D8%AA%D9%82%D8%A7%D8%B1%D9%8A%D8%B1/%D8%AA%D8%B5%D9%86%D9%8A%D9%81%201/WR%20STATUS%20Report-final%20draft%202014-04-01.pdf (accessed May 3, 2019).
[46] World Bank, 2018. *Securing Water for Development in West Bank and Gaza.* World Bank, Washington, DC.
http://documents.worldbank.org/curated/en/736571530044615402/pdf/WP-P157979-Securing-Water-for-Development-in-West-Bank-and-Gaza-PUBLIC.pdf (accessed May 4, 2019).
[47] PWA, 2013. *Status Report of Water Resources in the Occupied State of Palestine.*

The Groundwater Resources

The main sources of fresh water in the region are the four groundwater aquifers mentioned above. **The Western or Mountain Aquifer** is the most important shared aquifer between Israel and the OPTs. Generally, the annual yield (recharge) of the aquifer is approximately 362-400 MCM/y. It should be noted that Israel heavily exploits the Aquifer (340-430 MCM/y), leaving only about 38 MCM/y for Palestinian consumption.[48]

The other groundwater aquifer is **the North-eastern Aquifer**, which, even though is located in the territory of the West Bank, is heavily utilized by Israel. Thus, the annual sustainable yield of the Aquifer is around 100-145 MCM/y. Israel exploits about 103 MCM/y, and the Palestinians about 21 MCM/y.

Finally, the third groundwater aquifer in the West Bank is **the Eastern Aquifer,** with an annual yield of 145-185 MCM/y. The Israelis exploit 50 MCM/y from the wells and 100 MCM/y from the Dead Sea springs, while the Palestinians use 53 MCM/y from the springs and wells together.

Table 1 shows the distribution of the groundwater resources between Israel and the Palestinian Authority (PA) defined by the Oslo II Agreement and their real consumption. It is revealed that Israel's continuous exploitation of the aquifers has led to the uneven utilization of the shared groundwater resources, with the Palestinians utilizing 14%and the Israelis 86%.

Table 1: 'Shared' groundwater allocation between Israel and the PA according to the Oslo II Accord and the utilization in 2011 by Israel and in 2016 by the PA.

	Oslo agreement (MCM/y)				Utilization 2011 (Israel) and 2016 (PA) (MCM/y)			
Use	**WAB**	**NEAB**	**EAB**	**Total**	**WAB**	**NEAB**	**EAB**	**Total**
Israel	340	103	40	483	411	103	150	664
Palestinian Authority	22	42	54	118	38.7	21.7	53.0	113.4
Additional Quantity for Palestinian Development	_	_	78	78	_	_	0	0
Base in total	362	145	172	_	449.7	124.7	203.0	_

Adopted from World Bank 2018

* **WAB** – Western Aquifer Basin
NEAB – North-eastern Aquifer Basin
EAB – Eastern Aquifer Basin
** This data is the latest, as for Israel data is not available since 2011, and for the OPT in the West Bank since 2016.

[48]World Bank, 2018. *Securing Water for Development in West Bank and Gaza.*

Lowi argues that the most crucial reason for the establishment of Israeli settlements mainly in the West Bank is conditioned by the relatively abundant water resources, particularly the groundwater resources of the territory.[49] Looking at the map of the distribution of the settlements, it can be seen that these settlements are located directly near the aquifers, seizing the most arable and fertile lands from the local Palestinian residents. Besides having immediate access to the groundwater resources, they are able to easily change the flow of water, thereby forcing the dependence of the Palestinians. Thus, these arguments justify the uneven allocation of aquifer water resources between the Israelis and Palestinians.

In the Gaza Strip, the only fresh water source is **the Coastal Aquifer**. The annual sustainable yield of the aquifer is only 55-60 MCM/y in Gaza, while it is about 450 MCM/y in Israel. By 2017, the utilization of the Coastal Aquifer by Palestinians was estimated to be 185 MCM/y,[50] which is almost four times more than the annual recharge rate. This is mainly due to the growing demand of the local population.[51]

Well Abstraction

Generally, there are 383 wells in the West Bank belonging to all three aquifers. However, 119 out of these wells are not subject to pumping, and there is a necessity of rehabilitation for future pumping.The annual well abstraction rate is about 65.6 MCM/y, of which 33.5 MCM/y is for domestic use and 32 MCM/y for agricultural purposes. The number of Israeli wells in the West Bank is 39, and the annual abstraction rate of these wells is about 54 MCM/y. Israel has 500 wells belonging to the Western Aquifer in its territory, as a result of which the abstraction rate of the aquifer is more than its annual recharge rate (sustainable yield). Therefore, there is a water level decline, which greatly affects the Palestinians.[52]

In the Gaza Strip, the annual abstraction volume is 92.8 MCM/y for domestic use, and 86 MCM/y for agricultural purposes. Thus, the total volume of abstraction is 178.8 MCM/y, which means that this is three

[49] Lowi, *Water and Power.*
[50] The Palestinian Water Authority, 2018. *Gaza Water Status Report 2017*, https://reliefweb.int/sites/reliefweb.int/files/resources/gaza_water_resources_status_report_2017.pdf (accessed May 3. 2019).
[51] Fanack Water, 2017. *Water Resources*, https://water.fanack.com/palestine/water-resources/ (accessed May 4, 2019).
[52]PWA, 2013. *Status Report of Water Resources in the Occupied State of Palestine.*

times more than the annual recharge rate, leading to the water deficit in the Aquifer.[53]

Treated wastewater reuse

In the West Bank, wastewater disposal takes place either by being connected to the piped sewage networks or via on-site household cesspits (septic tanks or ditches). It should be pointed out that wastewater treatment facilities are deployed only in certain localities. Thus, only 31% of the population is connected to the wastewater treatment network system, and the rest relies on cesspits. Moreover, most facilities are worn out, which often causes leakages and spillages contaminating surrounding areas. Although about 31% of the families are connected to the wastewater treatment network system in the West Bank, there is currently only one operating wastewater treatment plant, which manages to treat less than 3% of the total sewage.

In the Gaza Strip, there are three wastewater treatment plants (WWTP) (BeitLahia, Gaza, and Rafah) and one wastewater collection pond (Khan Yunis). Accordingly, the number of households connected to the wastewater treatment network is higher compared to the West Bank. Here, about two-thirds of the population (72%) is connected to the wastewater treatment network system, and the rest regulates its wastewater collection at the cesspools (vaults or open drains). Even though approximately 72% of the Gaza Strip's households' waste is treated, the quality of the treated water is fairly low compared to the international standards and contains a large amount of organic loading. Thus, the outflow of this treated water is a severe hazard to the groundwater resources, the Mediterranean Sea, and public health in general, and the reuse of the treated water for domestic purposes can be dangerous.[54]

Desalinated water

Israel manages to overcome its water scarcities through desalination. However, currently, desalination is still behind in the OPTs. In the West Bank, it is generally not implemented, and in the Gaza Strip, it is implemented on a small-scale.

[53]PWA, 2018. *Gaza Water Status Report 2017.*

[54]Palestinian Central Bureau of Statistics, 2009, الفلسطينيللإحصاءالمركزيالجهاز الفلسطينيةالوطنيةالسلطة - Water Statistics in the Palestinian Territory, http://www.pcbs.gov.ps/Downloads/book1596.pdf (accessed April 28, 2019).

It should be pointed out that certain steps are being taken in this respect to build a central large-scale desalination plant in the Gaza Strip, to increase the quality of potable water and overcome the humanitarian crisis. On March 20, 2018, Brussels hosted the international donor Pledging Conference co-chaired by the European Commission, led by the EU Commissioner for European Neighborhood Policy and Enlargement Negotiations, Johannes Hahn, and the PA, as well as by the Palestinian Prime Minister, Rami Hamdallah, in partnership with a number of international institutions, including the European Investment Bank (EIB), the Union for Mediterranean (UfM), the Islamic Development Bank (IDB), and the World Bank to construct the desalination plant in the Gaza Strip. This project aims to meet the demands of about 2 million of Gaza's population. In total, the construction of the desalination plant costs approximately 562.3 million EUR to ensure 55 MCM/y of clean drinking water, of which there have been pledges of 456 million EUR during the conference, and 77.1 million EUR only by the European Union (EU).[55]

Although, it is still too early to assess this project and how much it will justify the expectations, it should be noted that if it is implemented this will be an important contribution for improving the water situation in the Gaza Strip.

Purchased water from Mekorot[56]

The OPTs, notably the West Bank, heavily complement their water demands by purchasing water from Israel. Although the OPTs are thus able to some extent bypass the Israeli restrictions on drilling new wells or pumping from the wells, in the long run this becomes another tool of pressure in the hands of Israel against the OPTs. As of 2016, the PWA imported approximately 79 MCM water from Mekorot, for the future, in the framework of the Red-Dead Sea conveyance project[57], agreeing to

[55] European Commission, 2018, *Hope for Gaza: EU creates broad international coalition to provide drinking water to 2 million people in Gaza*. Brussels, Belgium, https://ec.europa.eu/neighbourhood-enlargement/news_corner/news/hope-gaza-eu-creates-broad-international-coalition-provide-drinking-water-2-million_en (accessed May 6, 2019).

[56]Mekorot is the Israeli national water company since its foundation in 1937. The government-owned corporation is mainly engaged in water management and desalination, as well as it provides about 90% of Israeli drinking water.

[57]The planned Red-Dead Sea Conveyance or the Two Seas Canal project is a water pipeline connecting the Red Sea to the Dead Sea. The project aims at providing potable water to Israel, the OPTs, and Jordan. The canal lies entirely in the territory of Jordan, and the first phase of the construction of the canal will be launched in 2021.

increase the import to 32 MCM, and later on another 34 MCM. Overall, the PWA is obliged to purchase about 145 MCM of water from Mekorot.

Indeed, the PWA, unable to pay for this purchased water, accumulates large amounts of debt to Mekorot. According to the World Bank, in 2017, the amount of debt was 335 million USD, which Israel deducts from the taxes collected from the Palestinians on behalf of the PA. Furthermore, the amount of this deduction from taxes has increased by 10%as of 2017.[58]

Hydro-hegemony in the Israeli-Palestinian Shared Water Resources

As already noted in the conceptual framework of hydro-hegemony, the asymmetrical power distribution is a decisive factor to interpret Israel's established supremacy over the Palestinians in all spheres. Additionally, as it can be seen from the above discussion, the established 'order of things' between two parties is the result of continuous efforts of one side to increase its supremacy over the other. Thus, Israeli-Palestinian mutual relations over the shared water resources, both surface water and groundwater resources, and the maintenance of that rule for a long time, may conform to the framework of hydro-hegemony. It should be noted that the lingering water issue constantly exacerbates the conflict between them and the lack of compromise over this issue leads to a stalemate. In this case, understanding the asymmetry of power is essential.

Relative hard power asymmetry

First of all, it should be noted that the asymmetry of power in Israeli-Palestinian relations is clearly seen in the economic sector. Comparing the gross domestic product (GDP) per capita of the two countries in 2017, which is the latest data available for both Israel, the West bank and Gaza, it can be seen that Israel dominates Palestine. In 2017, Israel's GDP per capita was 40.270 US dollars,[59]while the West Bank and Gaza's GDP per capita was about 3.094 US dollars.[60]

Israel's supremacy is also evident in its military, which is composed of well-trained personnel and is also larger than the Palestinian

[58]World Bank, 2018. *Securing Water for Development in West Bank and Gaza: 4-5.*
[59] World Bank, 2017. *GDP per capita of Israel*, https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=IL (accessed May 11, 2019).
[60] World Bank, 2017. *GDP per capita of the West Bank and the Gaza Strip*, https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=PS (accessed May 11, 2019).

military forces. Israel's military strength depends on over an estimated 615.000 military personnel, 595 aircrafts, out of which 146 helicopters, 2.760 combat tanks, 65 naval assets,[61] whereas Palestinian military strength depends on small, poorly trained armed groups created after the Oslo II Accord.[62]

Due to a high level of education, Israel succeeds in having an industrialized economy, which allows them to invest a large amount of human capital in water resource development. The evidence of this is the fact that by developing new technologies (energy-efficient desalination plants that turn seawater and brackish water into freshwater; sustainable and cost-effective wastewater systems, etc.) Israel is able to increase the water supply and reduce water demand in its country.[63] As Booky Oren, the chairman and CEO at Booky Oren Global Water Technologies, states, *'Israel has turned to be a water-independent country in 2013, based on a variety of innovative technological water solutions'.*[64] However, it should be noted that the development of the water sector technologies also require significant investments. In 2017, the total amount of investments in this sector has reached 236.000.000 US dollars.

The only aspect where the two sides have comparatively identical footing of hard power is their position on water resources. On the one hand, Israel is in the downstream position over the West Bank's aquifer basin and on the other hand, it is upstream over the Coastal Aquifer in the Gaza Strip. Regarding its position on the Jordan River, Israel is downstream from Lebanon and Syria and upstream to the West Bank. Nevertheless, the supremacy of power again leans toward the Israeli side, as due to its technologies, as well as due to the settlements in the West Bank, it is able to overcome its somewhat unfavorable position.

Relative bargaining power asymmetry

As it has already been pointed out, bargaining power is associated more with having or acquiring legitimacy in a relationship. Referring to the Oslo II Accord, it can be seen that formally, both Israel and Palestine

[61] Global Firepower, 2019. *Israel Military Strength,* https://www.globalfirepower.com/country-military-strength-detail.asp?country_id=israel#overview (accessed May 15, 2019).
[62] Zeitoun, *Power and Water in the Middle East.*
[63] Israeli Water Authority, 2009. The Issue of Water between Israel and the Palestinians, http://siteresources.worldbank.org/INTWESTBANKGAZA/Resources/IsraelWaterAuthorityresponse.pdf (accessed April 28, 2019).
[64] Start-Up Nation Central (2019). *Watertech Brief*, https://www.startupnationcentral.org/sector/watertech/ (accessed May 15, 2019).

were given equality in terms of the number of representatives, opportunities, and obligations. Similarly, due to the International Water Law, both sides were given equal right, that is the Palestinians' compliance with the principle of *"no significant harm"* and Israel's conformity to the principle of *"equal and reasonable utilization"* of water resources.[65] However, the gap here between theory and reality should be highlighted.

Although the JWC was initially called upon to coordinate Israeli-Palestinian water relations over shared water resources and to bring about cooperation between them, the asymmetry is so significant that it is not a way of "cooperation."Perhaps it can be called "asymmetric cooperation," if such a thing is possible. Thus, the Palestinians, by signing the Oslo II Agreement and agreeing to its terms, entered into the game conforming tothe rules of the game determined by Israel (see Tables 2 and 3).

Table 2: Applications to the JWC from 1995-2008

Project type	Palestinian	Israel
Wells	188	3
Water supply network	394	108
Wastewater	20	24
Total	602	135

Adopted from Selby (2013)

Table 3: Approval rate (%) of the applications by the JWC from 1995-2008

Project type	Palestinian	Israeli
Wells	30-66	100
Water supply network	50-80	100
Wastewater	58	96

Adopted from Selby (2013)

Relative ideational power asymmetry

Supremacy in the ideational or discursive power context should be added to all the above-mentioned asymmetries, which, as already mentioned, is an essential component to have influence and to avoid explicit confrontation. Israel has managed to create a number of narratives to some extent justify its actions. The Israeli narratives are important tools to hide the realities on the ground.

In a nutshell, the stories created by Israel, which it has applied, can be presented as follows. First, Israel is a dry country, and it needs more water to meet its population's needs. Second, as a result of constant

[65]Jan Selby, "Cooperation, Domination and Colonisation: The Israeli-Palestinian Joint Water Committee," *Water Alternatives* 6, no. 1 (2013): 1-24.

dryness and drought, the water sector heavily suffers. Third, it is not the Palestinians' right to have certain authority over water resources in the OPTs, but it is a result of Israel's benevolence towards the Palestinians.

Conclusion

Generally, three types of crises related to water in the region of Middle East have been identified: the lack of quantity, the lack of quality, and the lack of equity. It is clear that the abovementioned water-related problems can be the result of both environmental and natural circumstances, as well as the result of intentional actions. In this regard, the Israeli-Palestinian conflict is unique, as it includes all the aforementioned issues simultaneously.

The research question posed at the beginning of this article was aimed at revealing the role of water in the Israeli-Palestinian conflict. It is clear that water plays a decisive role both in terms of the protraction of the Israeli-Palestinian conflict and well as in its ultimate reconciliation. Indeed, the continuous disputes over water, as well as constant Israeli discriminative operations connected with other issues, such as high population growth in the OPTs, the harsh conditions of the region, as well as Israeli illegal land confiscations, hinder any positive movement on the path to reconciliation and the establishment of a final peace between two parties in general. Water is a *"highly politicized"* factor in the Israeli-Palestinian conflict, and it serves as a tool in the hands of Israel to achieve its far-reaching goals, such as the gradual expulsion of the Palestinians from these territories.

The well-established Israeli hydro-hegemony over the Palestinians cannot be denied. Its supremacy in terms of economy, military, technology, education level, as well as creating successful perceptions amongst others allows it to override the Palestinians and gradually increase its supremacy by dictating the rules of the game.

In sum, it should be pointed out that from the discussion above, it becomes clear that the UN warning of 2013 should be taken into consideration seriously, because as a result of Israel's actions there are grave violations of human rights, irreversible health consequences, serious economic, social, political problems, and last but not least constant deadlock regarding the resolution of the conflict.