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Cities in the developing world

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Transboundary Water in Palestine and Israel

Amidst war and violence in Israel and Palestine, water resources are the silent killer that will affect individuals, the region, and the world. Palestinians will unequally feel the effects of climate change and strained water resources. On top of the Israeli Palestinian conflict resource sharing, water scarcity, sanitation, threat multipliers, and increasing populations are the leading drivers of the issue of transboundary water in Israel and Palestine. Transboundary water is the aquifers, lakes, and river basins shared by two or more countries (UN Transboundary Water, n.d.). Palestine and Israel share the Jordan river basin, mountain and coastal aquifers (Lautze & Kirshen, 2009). Once having an in-depth

understanding of mitigation and alleviation strategies, solutions can occur. However, there is no one answer to what can be done, because transboundary water affects individuals, regions, and the world and is tied into many different issues.

Figure 1: Kids Bathing in Palestine|| Mohammed Abed



Figure 2: Transboundary water in Palestine/ Israel|| International water law



Water and climate change, mainly in conflict zones, are known as threat-multipliers (Sowers et al., 2010). This means that they exacerbate pre-existing issues (Abrahams, 2020). In the example of Israel and Palestine, water scarcity in their transboundary resources heightens conflict as Palestine receives significantly less of the resource per Israel's control of water (Corradin, 2016). Transboundary water issues in Israel and Palestine call for legislative action, like the joint water agreement. The agreement oversees water planning and projects directly affecting both Israeli and other policy-making bodies (Fischhendler et al., 2011). Another important legislative action

is the 1995 Oslo II interim agreement (Corradin, 2016). The Oslo II Interim Agreement prevented Palestinians from maintaining or developing their water infrastructure through its illegal planning and permit regime (Corradin, 2016). Israel was granted 71% water control, while Palestine only received 17% (Corradin, 2016). This unequal sharing of water resources has caused strife in Palestine and Israel and is due to the human role of legislative action.

The history of the Israeli-Palestinian conflict needs to be understood to understand the transboundary water issues in Israel and Palestine. Originally Palestine was a part of the Ottoman Empire under the UK, though it never became independent (UN History of Palestine, n.d.). In 1917 the Balfour declaration passed expressing the support for establishing a national home for Jewish people in Palestine, and large-scale Jewish migration followed from 1922 to 1947. Arabs

demanding independence and held resistance to immigration which led to a rebellion in 1937 (UN History of Palestine, n.d.). After some years of conflict and questions of resolutions, Israel proclaimed independence in 1948, and over half of the Palestinian Arab population fled, were expelled, or were killed. This day is called Nakba Day, observed on May 15th, meaning catastrophe of disaster (Sommerlad, 2020). Following this, Israel annexed Jerusalem when a state claims sovereignty over another (UN History of Palestine, n.d.). Following a war broke out from the two conflicting sides, resulting in over half a million Palestinians fleeing. Resolution 242 was written to alleviate this, which called for Israel to withdraw from all Palestinian territories that they were occupying, provide settlements for refugees, and terminate all claims of belligerency (UN History of Palestine, n.d.). Warring still took place by the two countries leaving behind destruction, typically on the Palestinians side, and many displaced. These refugees fled to surrounding countries like Jordan and Lebanon (UN History of Palestine, n.d.). In June 1982, Israeli forces invaded Lebanon, and a large-scale massacre occurred in the Sabra and Shatila camps. In response to this, a mass uprising against Israeli forces broke out called the Intifada (UN History of Palestine, n.d.). Though this only created more suffering as Israel's military force was much more advanced and used methods that resulted in heavy injuries and large death tolls among Palestinians, many people were in need. The UN security council then demanded Israel indefinitely withdraw its forces in Lebanon in the internationally recognized boundaries (UN History of Palestine, n.d.).

A peace process began in the 1990s through the UN, which aimed to achieve a peaceful settlement of Israelis and Palestinians through negotiations based on previous resolutions. This was the first time talks about the transboundary water issues came into play. The talks focused on

arms control, environmental issues, economy, refugees, and water (UN History of Palestine, n.d.). These conferences were the signing of the 1993 Declaration of Principles on Interim Self-Government Arrangements- Which is the DOP, also known as the Oslo Accord. What proceeded this was a partial withdrawal of Israeli forces, more leadership in Palestine, and the partial release of prisoners (UN History of Palestine, n.d.). The goal of this was to get closer to a self-governing Palestine, yet the following events only pulled the countries further apart.

Figure 3: Palestinian Border Wall|| Sebastian Scheiner



In the early 2000s Israel started its construction on the border wall that separated Palestinian settlements from Israeli land (UN History of Palestine, n.d.). In 2002 the Arab League initiated the Arab peace Initiative following the Quartet (US, EU, Russia, and the UN)

released a Road Map to a two-State solution in 2003 (UN History of Palestine, n.d.). In 2005, Israel withdrew its settlers and troops from Gaza while retaining control over its borders, seashore, and airspace (UN History of Palestine, n.d.). The General Assembly adopted a resolution granting Palestine the status of a non-member observer State in the United Nations in the early 2000s (UN History of Palestine, n.d.). Since then there has been fighting and peacebuilding from both sides, as well as media efforts, being made to try to sway public opinion for control of another, but still there remains much less of what Palestine used to be and much more of what it was the country of Israel is today.

The issue of transboundary water in Israel and Palestine is a topic that is overshadowed by the looming conflict of the region. Many voices are conflicted in this as inequalities of unequal water rights erupt between the countries. The multiple players surrounding the water issues must be thought of as a working system, a feedback loop. In this system, everything interacts with one another; it can either amplify the effect, keep them neutral or minimize them.

The working system is built around water resources in Israel and Palestine, the working parts are resource sharing and control, water scarcity, sanitation, threat multipliers, and increasing populations. The key elements of this system work independently but heavily impact each other. For example, as climate temperatures increase water resources become scarce in the already arid land where precipitation is meant to decrease 25% (Margolis, 2020). Cropland soils will dry as rates of evapotranspiration increase, and more water will need to be used for agriculture. This contributes to water scarcity. Palestine, only receiving 17% of the shared water, has a water scarcity problem (Corradin, 2016). Water scarcity interacts with sanitation as 97% of Palestine's water is unfit for human consumption and contaminated water is the leading cause of child deaths in Palestine (Margolis, 2020). There are many other interactions between the countries where conflict and tension affect water resources. Explosives dropped in 2014 damaged soil and decreased its productivity is an example of political tensions and water scarcity interacting (Margolis, 2020). The result of this interplay increases runoff- contributing to various other feedback loops. Every part of transboundary water in Palestine and Israel is interconnected through resource sharing and control, water scarcity, sanitation, threat multipliers, and increasing populations.

Figure 4: Israel's Water Wars|| Al Jazeera

In a region where political tensions are high power and control is a common motif, author of Al Jazeera Camilla Corradin argues that water is used as a tool to control Palestinians (Corradin, 2016). Israel controls headwaters, which ensures they dictate where and how much water is distributed (Agha, 2019). Israel is granted access to 71% of transboundary aquifers, while Palestinians only were granted 17% access (Corradin, 2016). This ratio is far from equal, and Palestinians have to ration water. Palestinians use just over half of the WHO recommended daily amount of 100 liters per capita per day of domestic water needs (Luartz & Kirshen, 2009). Conversely, Israelis have access to 240 liters of water per person per day (Corradin, 2016). Israel has had control over Palestine since it occupied the West Bank in 1967. Israel has controlled Palestinian water resources through discriminatory water-sharing agreements, like the Oslo II Interim Agreement, which has prevented Palestinians from maintaining or developing their water infrastructure through its illegal planning and permit regime (Corradin, 2016). This treatment of unequal water resource sharing translates into control because Palestinians become dependent on Israel for water, and Israel controls how much water Palestine receives. A solution to water control in the two countries is for policymakers to join together and equally contribute to legislative action that would equitably share clean, safe water resources.

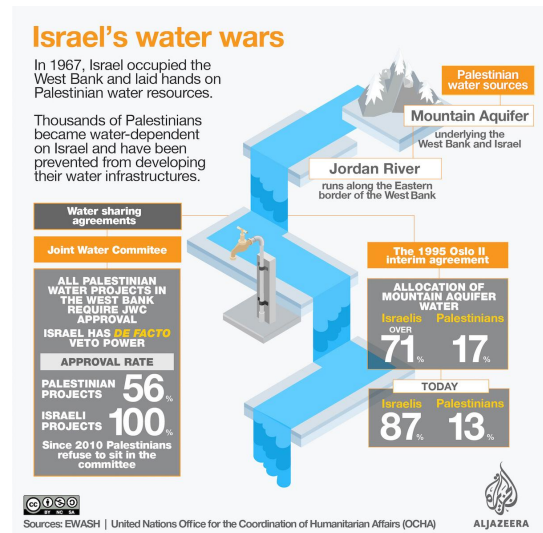


Figure 5: Child Filling Water|| Ibrahim Khatib



Water scarcity is another crucial player that revolves around the system of transboundary water in Palestine and Israel. Water scarcity is the lack of freshwater resources to meet the standard water demand; increased water scarcity in Palestine could be fatal for many (Margolis, 2020). There is a

lack of safe drinkable fresh water in Palestine due to the infrastructure needed to supply water and rising temperatures that are drying out the region. Contaminated water and sanitation play heavily into water scarcity as most water is not safe for human consumption. Secondly, there is not the adequate infrastructure in place to combat scarce water. Desalination plants are used to alleviate water scarcity in the MENA region, which is already the most water-stressed region worldwide (Sowers et al., 2010). Yet, it is not a viable option with high political conflicts in building the infrastructure (Feitelson et al., 2010). Developing new water access or repairing infrastructure is also very difficult: Israel grants few permits and demolishes Palestinian buildings and wells for water infrastructure (Agha, 2019). A video released by the Israeli Information Center for Human Rights in the Occupied Territories shows the Israeli military demolishing water lines in Palestinian villages (n.d., 2021). It is clear that water scarcity is an issue for Palestinians, primarily by preventing them from building new infrastructure. Another reason water is scarce in Palestine is by rising temperatures. Temperature in the Middle East North Africa (MENA) region and worldwide are rising significantly. Estimates made show that precipitation will decrease as much as 25% in the Israeli Palestinian region (Margolis, 2020).

With increasing temperatures and decreased precipitation, Israeli and Palestinian streams go dry, more forest fires, more invasive species, and an increased risk of disease outbreak, both infectious and vector-borne (Margolis, 2020). Water scarcity by means of climate change will affect public health, ecology, people's livelihoods. This relates to an individual and regional scale. On a global scale, water scarcity and climate change will affect world-systems; decreased precipitation will affect people worldwide. To dampen the issue of water scarcity, Israel and Palestine will have to make initiatives to become more water conscious, like reusing wastewater, using more water conservative agriculture techniques- like drip irrigation-, the countries should look to increase albedo- paving white roads and painting tops of houses white. There are many innovative ways to improve water scarcity, though there is a sacrifice of investments needed. Overall, a shortage in water resources will affect individuals, regions, and worldwide in terms of infrastructure and climate change.

Water resources and climate change act as a threat multiplier between Israel and Palestine- there is ample research showing that the Israeli-Palestinian conflict will make the impacts of the climate crisis more severe (Margolis, 2020). Water is found to be a potential security threat (Feitelston et al.). The main water issues include water scarcity, transboundary flow, and political implications (Lufkin, 2017). In Israel and Palestine, this means rising political tensions, climate refugees, and people in need of water (Lufkin, 2017). Though political tensions, refugees, and people in need are not new occurrences in Palestine (UN History of Palestine, n.d.). Palestine has a history of these issues due to Israel's occupation forcing Palestinians out of their country and settlements. When the Palestinian-Israeli conflict interacts with transboundary water and climate change, it exacerbates both of them. Abrahams studies how climate conflict

Discourse affects development and policymaking while examining how the structure of development can enable or disable institutions' ability to combat climate change (Abrahams, 2020). He found that the effects of climate-conflict relations are transdisciplinary and can act as a threat multiplier. Within Israel, it is unlikely that citizens will feel the direct impact of climate change (Feitelson et al., 2012). Conversely, Palestinians under occupation will suffer the effects of climate change more severely (Agha, 2019). Occupation prevents Palestinians from accessing resources, pursuing measures to support climate change adaptations and fragmented boundaries that challenge coping and maintaining leadership with climate change (Agha, 2019). The disproportion can be fatal. In Palestine, people are not thinking about the worsening effects of climate change and water resources but rather their livelihoods affected by the Israeli-Palestinian conflict. Though, when these two issues interact, they can amplify each other.



Figure 6: Gaza Clash|| AFP Getty Images on

Transboundary water and climate change will worsen in a conflict zone because of disproportions imposed on Palestinians. To alleviate the effects of threat multipliers in Israel and Palestine, representatives from both countries must come together to solve issues of transboundary water and climate change as an individual unit. This is necessary because climate change and transboundary water will ultimately affect both countries. Those effects can amplify tensions, so finding unity in climate and water discourse would be a viable solution in overcoming threat multipliers in Israel and Palestine.

Water sanitation is a plague that has continually endangered human survival, and we see it today in Palestine. Out of the 17% of transboundary water resources Palestinians receive, 97% of it is unfit for human consumption (Margolis, 2020). According to the UN, access to clean affordable water and safe hygienic sanitation is recognized as a human right (Human rights: UN-Water, n.d.). Why does Palestine only receive 3% of their fundamental human rights for water and sanitation while Israel has access to high-tech desalination and filtering systems? (Fischhendler et al., 2011). This unequal treatment is felt on an individual level by people being the victims of not safe enough, clean water. Lack of water sanitation is the leading cause of death for children in Palestine, as 12% of Palestinian children die from contaminated water (Agha, 2019). This is the cruel fate of Palestine being a water-scarce country dependent on Israel. On a regional scale, we can see that Palestinians are dying from water juxtaposed to Israel having world-class desalination plants which heed clean water (Fischhendler et al., 2011). On a global level, poor water sanitation kills as many people worldwide as Malaria and Human Immunodeficiency Virus infection/ Acquired Immune Deficiency Syndrome (HIV/ AIDs) (Lufkin, 2017). Water sanitation is a huge issue, and specifically in Israel and Palestine, is overshadowed by the conflict. For Palestine to acquire their fundamental human right to clean, safe water, Israel must make more safe water available by either giving more access to transboundary water or providing relief on desalination and filtration initiatives.

Increasing populations pose a risk for transboundary water resources in Israel and Palestine. On top of water scarcity, sanitation, threat multipliers, and water control, now Israel and Palestine have to manage an increasing population. Projections indicate that the Palestinian population will continue to increase, and renewable water resources will continue to decrease

after 2025 (Lautze & Kirshen, 2009). This adds stress to the system of transboundary water and can heighten the moving parts. In terms of actors in the system- Individuals, regions, and the world- they will all suffer effects. Individuals will experience a higher population density in

Israel and Palestine. In the West Bank (Palestine) the average population density is 468 people per kilometer squared (Agha, 2019). Compared to the global average, 25 people per kilometer squared (Ritchie, 2019), that is already a significant number. On a regional level, Israel has more land than Palestine and won't face such population density water issues. Israel also has significantly more water resources than Palestine- 71% to 17% (Corradin, 2016), so again population increase in Israel won't be such a problem

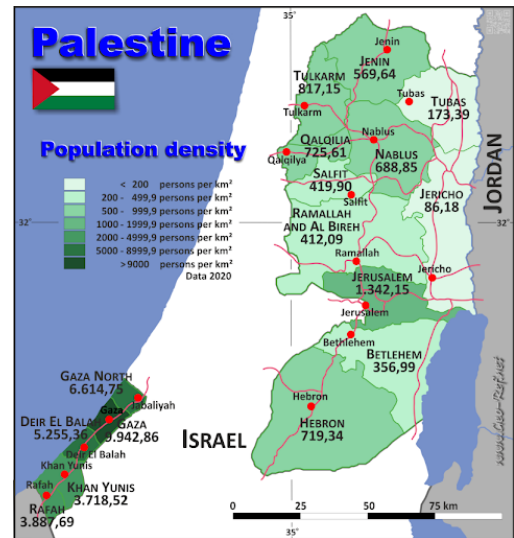


Figure 7: Palestine Population Density|| Geo-Ref

as it will and is in Palestine. The solution of the population increasing in terms of transboundary water has to do with demography- the study of populations (Khawaja, n.d.). The fertility rate is the ratio between births in a year and the whole female population of childbearing age (n.d., 2021). The fertility rate in Israel is 3.1, while the Palestinian fertility rate is 4.1 (Khawaja, n.d.). Though this is a staggering feat as Palestine's fertility rate used to be at 5.9 and has dropped in the last 20 years (Khawaja, n.d.). The solution to the population problem of transboundary water in Israel and Palestine is to decrease the fertility rate. This is possible by educating women, providing contraceptives, and improving health care. It can be assumed that this has already begun due to the decrease in the fertility rate in Palestine.

The issue of transboundary water and climate change is interconnected in every aspect of life on an individual, regional, and global scale- in no way is there a simple answer on how Palestine and Israel can solve the problem of water resources. However, by looking at transboundary water resources as a moving system, we can isolate the key players and provide options for solutions. The isolated themes of the transboundary water system in Israel and Palestine are resource sharing and control, water scarcity, sanitation, threat multipliers, and increasing populations. These themes are all happening simultaneously in a transboundary water system as tense political issues are occurring in the region. Their interactions will foretell the future of water resources in Israel and Palestine. It is only suitable to evaluate them now before their damaging effects become permanent on an individual, regional, and global level.

Transboundary water resources in Israel and Palestine are essential topics to evaluate because of the extent of systems and groups it affects. Overall more concern in public discourse is necessary when discussing transboundary water issues in Israel and Palestine. There are many moving parts within water issues like resource sharing and control, water scarcity, sanitation, threat multipliers, and increasing populations. These moving players are all critical on an individual, regional, and global scale. For the future, we must bring attention to the far-reaching issues of transboundary water resources in Israel and Palestine for the betterment of individuals, regions, and the world.

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