



## **The gendered impacts of climate change: The Jordan River Basin region and water scarcity**

Authors:

Elise Andrew, Wirtschaftsuniversität Wien

Carolina Borges, Technische Universität Berlin

Lucia Palmioli, University Of Pisa

Agency: Organization for Security and Co-Operation in Europe (OSCE)

Mentor: Marc Carillet

Peer+Counsel: Maria Alcidi, Florentine Schennach

## **Abstract**

Water scarcity is a global concern that will become even more pressing as the effects of climate change continue to unravel. This is especially true for women and girls who feel these effects disproportionately to their male counterparts due to the exclusion, marginalization, and discrimination they are subjected to within society. Israel and Jordan are two of the most water stressed countries in the world, highly sensitive to climate change, and will therefore be the geographical focus of this paper. The unfortunate relevance of water scarcity in Israel and Jordan and the uncertainty surrounding the associated risks posed to vulnerable populations has led us to the following gender-sensitive research question: *How are women and girls disproportionately affected by climate change, and more specifically, by the impacts of water scarcity in Israel and Jordan along the Jordan River Basin?* Through the synthesis and analysis of data available in public reports, we attempt to answer this research question by assessing a) the existing and potential vulnerabilities of women and girls that water scarcity threatens and b) the lack of opportunities to change and/or cope with these vulnerabilities. Our analysis will also include the political and ecological background of the region, as well as provide a brief description of the gendered impact of climate change.

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Elise Andrew, Carolina Borges, Lucia Palmioli

## **1 Introduction**

Achieving universal water security can be said to have been formally established as an international goal with the inception of the United Nations' (UN) Sustainable Development Goal (SDG) 6 - which is to "Ensure availability and sustainable management of water and sanitation for all" (UN, n.d.) As is the case for many other targets of the SDGs, the realization of universal water security depends on its trade-offs and synergies with other goals of the 2030 agenda. Both the SDG 5 - to achieve gender equality and empower women and girls - and the SDG 13 - to take the necessary action on climate - are essential to the discussion of achieving universal water security, and especially to the analysis of the gendered impact of water scarcity.

The impacts of climate change will significantly vary according to geographical, economic, political and social conditions. In societies wherein socio-economic, gender inequalities exist, the impacts of climate change will affect women and girls disproportionately to men and boys in a number of ways. This paper will discuss the gendered impacts of climate change with regard to water scarcity along the Jordan River Basin - a region characterized as one of the most politically and physically stressed in the world, subject to environmental stresses, population strains, political tensions, and the increasing environmental pressures of climate change.

## **2 Motivation**

The discussion of water scarcity is especially urgent in light of climate change, whose impacts are characterized by high risk and high uncertainty (Funtowicz & Ravetz, 2018). Water scarcity will only worsen as the effects of continued climate change unravel at unprecedented rates. Higher temperatures, and more extreme, unpredictable weather conditions affect the availability and distribution of rainfall, snowmelt, river flows, and groundwater (EEA, 2018). Rising sea levels as a result of climate change also threaten the availability of freshwater due to saltwater intrusion of groundwater resources, and saltwater intrusion of surface level freshwater, in the case of rivers and streams containing groundwater (WEF, 2019).

Water scarcity is geographically dependent, and its discussion, therefore, should be grounded in regional analysis. The Middle East is the most water-stressed region in the world, with around 51 million people lacking basic drinking water service in 2015 (UN-Water, 2019). The region is particularly vulnerable to the effects of water scarcity due to environmental factors, such as variable climate and vulnerable groundwater resources (Black, 2010). Moreover, the issue of water scarcity in the region is compounded by a number of other socio-political factors that will

be further discussed in detail, such as political instability, refugee influxes, and disparity in water exploitation. This paper focuses on water scarcity specifically in Israel and Jordan - two Middle Eastern countries in which these characteristics are of high relevance. Israel and Jordan geographically share their dominant water source - the Jordan River and its associated aquifers - most importantly, the Lower Jordan River and the Dead Sea.

### 3 Research aim and focus

For the purpose of the discussion, first we must define the term 'gender'. Gender will be defined here as "a 'constitutive element of social relationships based on perceived differences between the sexes' (Scott, 1988, 42)" (as cited in Jacoby, 2002, 86) and is, therefore, understood as a social, rather than a biological term. This means that the practice and discourse of gender reproduces a "bundle of expectations" (Jacoby, 2002, 86) about 'femininity' (and 'masculinity') towards women and girls (and men and boys) regarding what is the socially valuable and culturally acceptable way of being. The difference between these expectations of 'femininity' and 'masculinity' represents the power dynamics between men and women "in terms of their access to economic, political and military authority" (Jacoby, 2002, 86), or in other words, represents gender disparity in society.

Second, we will define the concept of 'gendered impact' by the definition provided by the World Health Organization (WHO) in the publication, *Gender, Climate Change and Health*:

"Gender norms, roles and relations are important factors in determining vulnerability and adaptive capacity to the health impacts of climate change. Women's and men's vulnerability to the impact of extreme climate events is determined not only by biology but also by differences in their social roles and responsibilities. Although they vary, these roles and responsibilities exist in all societies" (WHO, 2014, 5).

As can be noted in the definition above, the gendered impact of climate change refers to the dissimilar impact on *both* genders; however, our research focuses exclusively on women and girls. We argue that the negative impacts of climate change that disproportionately affect women and girls exacerbate existing vulnerabilities, amplify existing gender inequalities and further stagnate their role in combating these vulnerabilities as well as in combating climate change as a whole. In other words, the gendered impact of climate change refers both to how climate change enforces gender disparity and also to how gender disparity inhibits climate resilience (or, climate mitigation and adaptation). 'Gender disparity' refers to the social norms and institutional discrimination that result in the imbalanced division of labor, lower incomes, lesser livelihood opportunities, lesser access and control over land and other productive assets, fewer legal rights, lesser mobility and lesser political and professional representation (UN Women, Green Climate Fund, 2017).

Our paper will first describe in depth the relevant background information: a) the ecological conditions in Israel and Jordan and the Jordan River Basin region, and b) a brief background of the political history and water management policies of the respective countries. Our paper will then attempt to answer the research question "*How are women and girls disproportionately affected by climate change, and more specifically, by the impacts of water scarcity in Israel and Jordan?*" by investigating two categories of gender disparity: First, vulnerabilities which worsen the social impacts of water

scarcity experienced by women and girls, and second, the lack of opportunities to change and/or cope with these vulnerabilities. The vulnerabilities discussed will be categorized into four focus points, or indicators: a) marginalized positioning/domestic role of women and girls, b) the biological functioning of women and girls, c) intersectional discrimination, and d) the role of existing and violent conflict. The lack of opportunities discussed will be categorized into two focus points, or indicators: a) exclusion from decision-making processes and lack of representation, and b) lack of material equalities.

The recognition of the gendered impact of climate change has evolved in recent years, with growing awareness of how gender equality and women's empowerment plays a role in reducing climate change vulnerabilities and achieving climate action and resilience (eg. Gender Action Plan 2017 of COP 23). We intend for our research to enrich the existing research by providing a regional perspective and concrete evidence and proposals, linking the relevance of gender equality to the relevance of water scarcity.

## 4 Methods and methodology

Our paper explores, assesses and discusses a wide array of socio-ecological and political variables to answer the research question: *How are women and girls disproportionately affected by climate change, and more specifically, by the impacts of water scarcity in Israel and Jordan along the Jordan River Basin?* Our methodology consists of a synthesis and analysis of existing publications from international organizations to assess these variables, such as reports from United Nations Water, United Nations Women, the World Health Organization (WHO), the International Labour Organisation (ILO), and the World Bank, as well as from the UN Sustainable Development synthesis reports, the Organization for Co-operation and Security in Europe (OSCE) partnership reports, and the UN Children's Fund education reports. A review of academic literature is also used to obtain an overview of the political background of the region, as well as to explore some of the social variables of exclusion, marginalization, and discrimination that are grounded in historical analysis. The data collected and the socio-political analyses found in the review of the existing publications and academic literature are systematized into the pre-conceptualized categories and sub-categories to provide a simplified overview of the gendered impact of water scarcity (in Israel and Jordan) for further analysis and discussion.

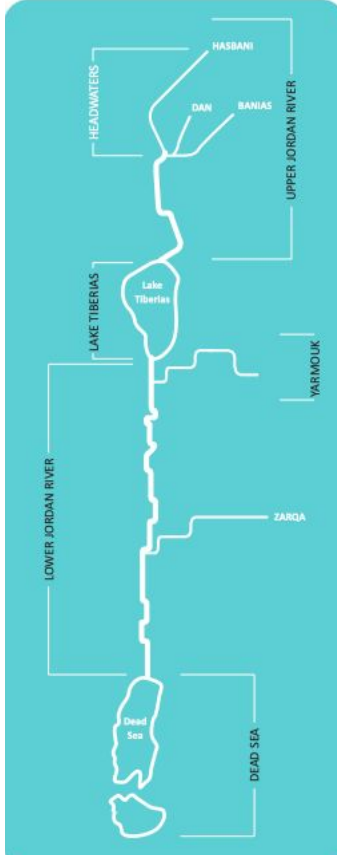
We acknowledge the many limitations of our research methodology. First, we do not have primary source data from the population in question - namely, women and girls in Israel and Jordan - due to lack of resources. This means that our research aim of exploring socio-economic factors that determine the gendered impacts of women and girls is limited to the data accessible in public reports and the existing socio-political analyses in the academic literature review. The lack of primary qualitative data means that our research firstly captures the quantifiable phenomena, potentially missing the very real, lived experiences of gender disparity. Additionally, many relevant figures from international and national reports are not disaggregated, meaning that the data does not differentiate between genders, rendering a gender-sensitive analysis impossible. When the figures derived from these reports are, in fact, disaggregated to show differences among genders, they are often insufficient in that important characteristics like age, level of education, location, and other useful descriptors are not differentiated. Second, we also acknowledge the role of our own biases in the conceptualization of the categories and

sub-categories, in determining which categories are relevant and should, therefore, be included. There are potentially socio-economic and political variables that play a role in enforcing and/or exacerbating gender disparity, or inhibiting climate resilience, that are unforeseen by the authors of this paper and are therefore excluded from the analysis. Therefore, we do not claim to provide a complete picture of the gendered impact of water scarcity in Israel and Jordan. Instead, we attempt to provide a simplified overview to facilitate the discussion and encourage further gender-sensitive climate research.

## 5 Background of the region

### 5.1 Environmental background

In the analysis of water scarcity in the Jordan River Basin, it is necessary to provide an overview of the relevant environmental factors, namely the geography, climate, and hydrology of the region.



The Middle East is the most water-stressed region in the world known for its dry climate - particularly dry during the summer months - with high evaporation rates, and unpredictable, variable, little rainfall. This makes water an extremely scarce and unreliable resource. The region is also known for its uniquely dense and increasing population, translating to low and decreasing water per capita.

The Jordan River covers a distance of 223 km from north to south and is divided into the Upper and Lower Jordan River (UN-ESCWA & BGR, 2013). It flows south and discharges into the Dead Sea. The river has five riparian states: Israel, Jordan, Lebanon, Palestine and Syria, though, Palestine and Syria have no access to the Jordan River itself (UN-ESCWA & BGR, 2013, 171). The basin area shares are as follows: Israel (10%), Jordan (40%), Lebanon (4%), Palestine (9%), Syria (37%), though the estimated total irrigated area (100,000- 150,000 ha) is shared as follows: Israel, Jordan and Syria (each roughly 30%), Palestine (5%) and Lebanon (2%) (ibid.). The basin population is 7.18 million (ibid.). Israel obtains most of its water via the Israeli National Carrier, which diverts water away from Lake Tiberias (aka Lake Kinneret, or the Sea of Galilee). Jordan obtains most of its water from the Yarmouk River, which is the largest tributary of the Jordan River. Israel and Jordan, in addition, share the salt-water of the Dead Sea.

Figure 1. Sketch of the Jordan-Yarmouk River system

There are a few important geographical features to note in this section. The most important feature to note is the considerable amount of freshwater resources that cross national boundaries (Comair et. al, 2012). This means that much regional cooperation is needed for the managing and sharing of the essential resource. Another geographical feature to note is the disadvantaged downstream location of Jordan. This is because the Lower Jordan River is particularly polluted - due to untreated sewage and agricultural return flows, as well as from the brackish waters of Lake Tiberias (UN-ESCWA & BGR, 2013, 171) - as well as the fact that rainfall decreases dramatically moving south. The Lower Jordan River also suffers from extremely high salinity. Another disadvantage Jordan has is that it is not a basin country of the freshwater lake, Lake Tiberias. Southern Israel is also disadvantaged given its downstream location because water demand is higher in the heavily populated coastal regions and in the southern half; despite that rainfall and water reservoirs are mostly concentrated in the north (Israel MFA, 1994).

In terms of hydrology, as previously mentioned, the region is marked by low, unpredictable and variable rainfall. In addition, most of the annual precipitation is not usable - lost either to the atmosphere or to the Mediterranean and Dead Seas (Israel MFA, 1994). With climate change persisting, the variability, intensity, and unpredictability of the region's precipitation will only worsen. First, reduced precipitation will reduce the amount of permeable soil - already a problem from desertification processes - which will expand "crust" surfaces, increase surface run-off, and facilitate more desertification. Second, increase in water intensity will also lead to an increase in surface runoff, resulting in soil erosion and reduced infiltration rates, which will reduce aquifer recharge. It will also result in increased deposition of sediments in reservoirs and channels, directly affecting the water supply. And third, rising sea level as a result of climate change will also reduce the efficiency of water transfer and increase the likelihood of inundations and creations of swamps. Jordan, being a downstream riparian state, will be doubly disadvantaged by a reduction in precipitation and subsequent reduction in streamflow (Pe'er & Safriel, 2000).

Other environmental concerns are the water fluctuations in Lake Tiberias, the associated risk of saline water intrusion from below, and most importantly, the decline of the Dead Sea, which is the lowest lake in the world after Lake Tiberias. Due to high evaporation rates, as well as exploitation, the lake's water level is declining by more than one meter (3.3 feet) a year, leading to mudflats, landslides, and sinkholes (Comair et. al, 2012).

## 5.2 Political background

Israel and Jordan share a long history of water resource conflict and a short history of water cooperation in the Jordan River Basin. The countries were mostly in conflict, even resulting in violent retaliation, over the diversion of the Jordan River and its aquifers until the 1994 Peace Treaty and other bilateral agreements. The 1994 Jordan-Israel Peace Treaty was an agreement that Lake Tiberias would serve as an operational storage reservoir both for the Israel National Water System and for the Jordan Valley Water Project (Hof, 1995) (Black, 2010, 5115). Israel and Jordan also agreed that in order to meet both countries' future water needs, they would have to initiate projects of regional and international cooperation to ensure the best management and development of limited resources. Such an example of post-1994 cooperation is the Red



Sea-Dead Sea project (Israel, 2016). The Red Sea–Dead Sea project is a recent collaboration between Israel and Jordan, which would bring water from the Red Sea to a desalination center in the Jordanian port of Aqaba (Ackerman, 2019), that would process water for Israel and Jordan, and channel the remaining water to the Dead Sea (Coren, 2019). Each country would pledge \$40 million per year to the project for 25 years (Ackerman, 2019). Water diplomacy between the riparian states, though, is inextricably linked to ongoing conflict in the region. Though the Red Sea-Dead Sea deal was signed in 2013, the project was stalled due to diplomatic tensions, ie. the 2017 crisis when violent conflict broke out between a young Palestinian and an Israeli guard at the Israeli embassy in Jordan. After a new ambassador to replace Einat Shlain, Amir Weisbrod, took the job, relations resumed to normal and the project unfroze (Coren, 2019).

Israel's water management can be categorized as “a paramount policy objective” (Tal, 2017, 126), since the Holocaust immigration and population influx required the expansion of agriculture and consequently the supply of water for agriculture. The National Water Carrier was built in 1964, a massive infrastructure investment project consisting of giant pipes, tunnels, reservoirs, canals and pumping stations, which transfers water from Lake Tiberias to the rest of the country. When the water of Lake Tiberias delivered salt onto the agricultural soils, leading to the threat of long-term salinization, new institutions were created, including a Water Commission, new water laws, and drinking water and treatment standards (left to the Ministry of Health). Because of poor pretreatment in Israeli factories, a national master plan for wastewater reuse was initiated. Future technological innovations transformed Israel's water management, such as drip irrigation, conservation campaigns, water pricing, and an era of desalination technologies after the introduction of reverse osmosis.

Jordan's water management policies have been categorized by stringent methods, such as rationing and privatization. Where water for agriculture was prioritized in Israel, urban water was prioritized in Jordan. The publication of the National Water Master Plan of Jordan (2004), which expires in 2020, does not take climate change impacts into account (Black, 2010). Recently, further pressure on Jordan's freshwater resources has stemmed from a sudden population increase during 2011–2015 in large measure due to its rapid acceptance of more than 1.3 million refugees, of which 1 million were Syrian, compared to a native Jordanian population of 8.2 million (Gorelick, S. & Rajsekhar, D., 2017).

## **6 Investigation of the gendered impacts of water scarcity**

Women and girls are disproportionately affected by environmental challenges compared to their male counterparts due to “gender-specific role attributions, positions, and functions” (Littig, 2002) within society. This paper will categorize this gendered impact of water scarcity into two sections: first, vulnerabilities which exacerbate the negative effects of water scarcity on women and girls, and second, the lack of opportunities to change and/or cope with these vulnerabilities. The vulnerabilities discussed will be categorized into four focus points: a) marginalized positioning/domestic role of women and girls, b) the biological functioning of women and girls, c) intersectional discrimination, and d) the role of existing and violent conflict. The lack of opportunities discussed will be categorized into two focus points, or indicators: a) exclusion from decision-making processes and lack of representation, and b) lack of material equalities.

## 6.1 Vulnerabilities for women and girls in regard to water scarcity in Israel and Jordan

**Marginalized positioning/Domestic role:** As discussed earlier, gender reproduces “a ‘bundle of expectations’ about socially valuable and culturally acceptable norms related to ‘masculinity’ and ‘femininity’...” (Jacoby, 2002, 86). These socially-constructed ‘bundle of expectations’ about femininity in many cases translates to the expectation that women and girls assume the role of family and household caretaker.

The non-wage, reproductive labor, or ‘invisible work’ or ‘informal work’, that women and girls provide, such as domestic cooking, cleaning and family care, are more sensitive to water scarcity and the effects of climate disruption due to these activities’ reliance on fresh, clean water for proper implementation. Additionally, in many societies, women and girls are expected to be the responsible providers of clean, fresh water; and must collect water for the household. In this case, it is particularly dangerous for women and girls to collect from unsafe sources (eg. contaminated, polluted water sources), increasing the risk of water-related diseases, as well as increasing the threat of violence in the case of traveling a dangerous route.

In research conducted by the Mercy Corps in areas of Jordan severely affected by water scarcity and hard hit by the Syrian refugee crisis, interviewees report the difficulties female-headed households face during periods of water shortage. Many of these socially-isolated households rely on private water transported house-to-house by truck. The research describes how male truck drivers prioritize the delivery of water to friends - “virtually all of whom, for cultural reasons, will be men” (Mercy Corps, 2014) - as well as the difficulties of single women to pump water from the truck, a heavily physical activity. Furthermore, the research has identified vulnerabilities related to the domestic role of married women in times of water scarcity. Water shortages are reported to cause friction among couples and women are often blamed by their husbands when it is necessary to buy more water for the household (ibid.).

In Jordan, the domestic role of women is clearly illustrated by the absence of women in the labor market. The country ranked 135 out of 144 countries in the World Economic Forum’s Global Gender Gap Index for 2017 (MOE, 2018), with female participation in the labor market at only 14% compared to 64% for men in 2016 (MOE, 2018). This is one of the worst employment inequalities in the world.

Israel, on the other hand, ranks 46<sup>th</sup> globally in the Global Gender Gap Index 2018, and displays the best results among countries in the Middle East and North Africa. Female labor force participation rate in Israel is 59.8%, compared to 68.3% male participation rate (ILOSTAT, 2018). Women’s share of employment in senior and middle management positions, though, is only 34.3%, illustrating the gap between economic participation and opportunity (ISOSTAT, 2016). Fogiel-Bijaoui (2015) argues that despite the recent achievements in the direction of gender equality in the country, the strength of patriarchal patterns in Israel can be perceived in the gendered division of labor and in the ideology of women’s domestic responsibilities. This can be observed, for instance, by the fact that women work fewer hours than men. The part-time employment rate for women in Israel is 22.2%, compared with 9.2% for men (OECD, 2018).

Furthermore, the domestic role of women in Israel is highly influenced by the country’s legal environment, which is unique among modern legal systems in having various personal status laws

in the area of family law that are regulated by religious courts (Israel Ministry of Foreign Affairs, 2019). For example, divorces are subject to religious law in the country, with the rabbinate overseeing marriage for Jewish citizens and enforcing the Jewish law that only the husband may formally request a divorce. Fogiel-Bijaoui (2015) claims that the idea that a woman belongs to her husband underpins the legal requirements for divorce and dictates other cultural and legal rules, relegating women to the private sphere. Jacoby (2002) explains how the ideology of the 'nationalist family' has the same effect of domesticating women: "In both instances, the idea of the 'nationalist family' is a normative structure that embodies strategic value. The gendered significance of this politicized understanding of the family lies in its impingement upon women's obligation to the nation. The nationalist family perpetuates domesticated notions of women's role as reproducers of culture and social continuity, and members of the national collectivity" (89). Jacoby (2002) also notes that the unwritten 'status quo' accommodation of Orthodox Judaism by the state has similar implications for women to occupy traditional roles as mothers and bearers of children (88).

Although the culturally embedded notion of the domestic role of women contributes to increasing gender disparity and undermines women's socio-economic contributions, Israel's high access rates to safely managed sanitation services for women lessen their vulnerability to effects of water scarcity; however, risks posed disproportionately to women and girls are dependent not only on the water supply, but also on the water quality. This will be discussed in the following section.

**Biological functioning:** When the water women and girls collect or receive is of poor quality, women and girls are disproportionately affected by its exposure because of their a) critical exposure to water through domestic activities (Synthesis Report, 2018), as mentioned above, and their b) biological functioning of menstruation and pregnancy. In times of drought, or clean water scarcity, priority may be given to more pressing needs for water, such as drinking and cooking, as opposed to feminine hygiene practices (WHO, 2014).

In Jordan, the majority of the population has improved access to water sources - 95.4% of the urban population and 89.6% of the rural population are connected to piped water supply (Ministry of Water and Irrigation, 2017), though the provision of water remains unreliable especially in rural areas. In urban centres, water is usually available once a week, while in rural areas, availability is limited to once every two weeks, with even reduced frequency during the warm season (UNICEF, 2017). As explained by an EcoPeace representative: "in Jordan houses, on the rooftop, you have a water reservoir (2-3 cubic meter), you have to store the water you buy from the government for the whole week and you have to adapt your daily life - showering, cooking, etc. - to this amount. If you run out of water, you have to call a private contractor, who will bring you water with like 6 times the price higher than the normal" (EcoPeace interview). According to data by the Ministry of Water and Irrigation of Jordan (2017), 50.3% of the population has only 24 hours per week of piped water supply or less. Moreover, access to sanitation remains a challenge in the country, with only 84% of sanitation systems being safely managed, as defined by the UN Sustainable Development Goals Guidelines (Ministry of Water and Irrigation, 2017).

Israel, on the other hand, has been able to achieve water security with the implementation of a policy for sustainable water management combining institutional and regulatory reforms with

massive investment in technology and infrastructure development. The country has become a world leader in desalination technology, which has allowed for security in the supply of potable water for the population. At present, 85% of the potable water distributed in the country is desalinated water (World Bank, 2017). Furthermore, an important feature of Israel's water sector is the treatment and reuse of wastewater for irrigation. According to the country's National Review to the UN Sustainable Development Goals, 93% of the sewage collected is treated, and 86% is reused. According to World Bank Data (2017), 94% of the population of Israel has access safely managed sanitation services. This is positive for women and girls in Israel, in terms of reducing their vulnerability to clean water scarcity.

**Intersectional discrimination:** Intersectional discrimination, or experiencing multiple forms of discrimination based on culture, class, gender, and place (Rap & Jaskolski, 2019), plays a significant role by compounding the gendered impact of water insecurity. Two particular groups of people will be discussed here: Palestinian women in Israel and Syrian refugees in Jordan.

Given existing territorial disputes between Israel and Palestine and long-standing tensions between Israel and the Arab states, Palestinian women in Israel are at higher risk of exclusion, discrimination, and marginalization. Given Israel's planning and zoning regime, Palestinian women and their families can be forced to live in poorer living conditions with restricted access to water and sanitation, according to the Committee on the Elimination of Discrimination against Women's (CEDAW) (2017) report on Israel. CEDAW is the body for the UN Human Rights Office of the High Commissioner of independent experts that monitors implementation of the Convention on the Elimination of All Forms of Discrimination against Women (OHCHR, n.d.). Long paths to water sources in these socially-isolated districts put Palestinian women and girls collecting (heavy) water at an extra high risk of violence and sexual assault, who already report instances of violence and harassment by Israeli security forces (CEDAW, 2017). It can also be argued that the access to and quality of healthcare for Palestinians is targeted, as restriction on freedom of movement at checkpoints entails "hardships in accessing health care facilities such as hospitals, clinics, as well as emergency care and specialised treatment" (CEDAW, 2017, 13). Women and girls in prolonged administrative detention and transfers from the Palestinian Territories to places of detention in Israel, also restrict their access to healthcare services (CEDAW, 2017, 14). This disproportionately affects the women and girls who experience illness caused by lack of a clean water supply. While recognizing the complexity of the situation, we encourage a facilitation of discourse between the Israeli government and Palestinian communities regarding this critical issues.

Syrian refugees in Jordan also experience additional discrimination in obtaining access to fresh water. While Jordan's 2008 Water Strategy assumed a population growth from approx. 5.87 million inhabitants in 2008 to over 7.8 million by 2022, the influx of Syrian refugees has largely contributed to Jordan's population reaching 10.1 million in 2019 - nearly double its population at the turn of the century (Worldometer, 2019). Although the Government of Jordan has opened the country's doors to host refugees of the Syrian crisis - "hosting the second highest share of refugees pro capita in the world" (UNHCR, 2019) - the institutions and infrastructure for the provision of water have not been able to meet the rapidly increasing demand for clean water. Water scarcity hits the refugee population living in refugee camps particularly hard, where access to water is even more limited. The refugees in the Zaatari camp in Jordan, for example, receive approximately 35 liters of water per day per person, while the target of the Jordanian government

is for each citizen to obtain 100 liters of water per day (UN-Water, 2019). In Zaatari, water scarcity forces families to share one bathtub, avoid washing clothes and limit drinking water consumption to ensure availability (Hurt, 2018).

**Existing conflict:** It is important to mention that water scarcity has the potential to exacerbate existing conflict and violence, as well as create new conflict (McMahon, 2010). A CNA report entitled *The role of water stress in instability and conflict* (2017) found that water stress can inflict a full spectrum of conflict, from civil unrest and localized violence, to exploitation by non-state actors, violent extremist organizations, and insurgents, as well as trigger destabilizing secondary effects, leading to conflict (2-3). Water stress, for example, has the potential to exacerbate the Israel-Palestine conflict or diplomatic tensions between Israel and the Arab states.

Women and girls may be disproportionately affected in the event of exacerbated (or new) conflict. Jacoby (2002) writes on Middle Eastern state conflict: “[Conflicts] spill over into the private sphere in the form of militarized social relations and gendered insecurity. The vulnerability of women often results from the dependence of regime self-preservation on a centralized form of patriarchal authority, a disproportionate military defence budget and uniformed male decision making in times of crisis” (84). Jacoby (2002) expands on the ‘mobilization-marginalization’ phenomenon in Israel, writing that the primary role of the military in Israel society and “the underlying prioritization of military over civilian interests” (85) has given elite military men the responsibility for making key decisions on crucial matters justified by the notion of national security, creating a large military-industrial complex. The predominance of the military-industrial over civilian interests in Israel, Jacob (2002) argues, has developed “with the predominance of men over women, who occupy a secondary role in military affairs and a disproportionately large role in the private sphere” (86). Saragust (2019) argues that with national security at the top of the country’s political agenda, the army is the most influential organisation in the Israeli society, and a breeding ground for political leaders. Although the compulsory military service in Israel applies to both men and women, some high-level positions within the army are still not occupied by women. In other words, the diversion of resources from civil society to the military means less resources available to women and girls in need and a large-military industrial complex gives military experts (primarily men) powerful decision-making positions.

The pressure of existing conflict is especially true for the Israel-Palestine conflict. Conflicts in 2014 in the Gaza region led to the destruction of sewage networks and treatment plants, aggravating the situation of water scarcity in the disputed areas (Oxfam, 2017). According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (2019), the demolition of water and sanitation infrastructure due to the lack of Israeli building permits compromises the access to water in the region and can lead to displacement of the population and increase the risk of diseases.

Overview table

Vulnerabilities in relation to water scarcity				
	<b>Marginalized positioning/do mestic role of women and girls</b>	<b>Biological functioning</b>	<b>Intersectional discrimination</b>	<b>Existing conflict</b>
Israel	Religious courts, family law, and notions of the 'nationalist family' dictate women's positioning, relatively equal participation in labor market, women work fewer hours	Has secured water security through utilization of desalination and wastewater treatment technologies	Palestinian women and girls inhibited access to water supply and healthcare services	Risk of increasing Israel-Palestinian conflict tensions
Jordan	Extremely low participation rates of women in labor market (only 14%)	Unreliable water supply and sanitation, though improving	Massive influx of Syrian refugees places strain on resources, water to refugees not prioritized	Risk of increasing diplomatic tensions with Israel
Lack of opportunities to change and/or cope with these vulnerabilities				
	<b>Exclusion from decision-making processes/lack of representation</b>		<b>Lack of material equalities</b>	
Israel	High education equality, increasing but low representation of women in Parliament (30%), equal participation of women in climate delegations		Large income gap between tertiary educated women and men (only two-thirds of male counterparts)	
Jordan	High education equality, strong underrepresentation of rural women, increasing but very low representation of women in Parliament (15.4%), very low participation of women in climate delegations		Large income gap (especially in the private sector - male counterparts earning 40% more) women paid below minimum wage	

## 6.2 Lack of opportunities for women and girls to act on climate change and water scarcity in Israel and Jordan

### **Lack of representation and exclusion from decision-making processes:**

Inclusion in decision-making processes for mitigating and adapting to the gendered impacts of climate change and water scarcity has many “moral and pragmatic” (Figueiredo & Perkins, 2013, 188) reasons. The moral reason is that the ones most greatly affected by water scarcity should be the first to decide how the resource is managed. The pragmatic, less normative reason, is that sustainable, long-term water management is better when participatory and inclusive because given their social roles and positioning, women and girls “possess local ecological, social and political knowledge which can inform and contribute significantly to climate change adaptation strategies” (Figueiredo & Perkins, 2013, 188). Women and girls have a unique perspective, given their experience in society as traditional domestic care-takers with female biological functionings and some that are overtly faced with the threat of existing conflict and intersectional discrimination, that should and must be taken into account when setting the agenda and designing policy action plans, business strategies, education curriculum, and all other water-related climate action activities. Yet, there still exists inequality in representation and decision-making positions for women - in the labor market (especially in high-ranking positions), parliamentary representation, and employment in relevant political bodies (like the Ministry of Water and Irrigation) - which hinders the construction of fair and effective action plans. This is not to say that women and girls, by their biological nature, will do a better job of managing water. This essentialist position, made by cultural eco-feminists (Merchant, 2014), which “is derived from the assumed female abilities to provide and care” (Littig, 2002), is not argued here. It is instead argued here, that the social positioning and roles of women and girls give them a unique and useful perspective.

In order for women to attain positions with high levels of decision-making, gender equality in education must be addressed. International reports have shown that Israel and Jordan have high levels of gender equality in education attainment (OECD, 2016). In fact, in Israel, 60% of Bachelor’s students and 61% of Master’s students were women in 2014 (OECD, 2016). The completion rates are also almost the same across genders (ibid.) and the UN Children’s Fund (UNICEF) reports that Jordan has “maintained gender parity in education since 1979” (UNICEF, n.d.). While this is good news, there still exists gender disparity in the ability to find work after education - discussed previously - as well as gender disparity of income - discussed below. There also exists gender disparity in the ranking of job positions. In 2014, the number of male CEOs in Israel was 38,862, while the number of female CEOs was only 6,955 (Tzameret-Kertcher et al., 2016).

A specific example of a group excluded from decision-making is rural women in Jordan. Within the project “Strengthening Women Leadership in Agricultural and National Advocacy in Jordan”, developed by the UN Women in cooperation with the Arab Women Organization of Jordan (AWO) and the Center for Women Studies of the University of Jordan (CWS), interviews were conducted with rural women in several communities to better understand their perception of their role in climate action. The main findings point out a lack of clear vision among rural women regarding their role in climate decision-making. The study demonstrated an “apparent disconnect between rural communities and existing climate change planning processes conducted at national

level” (UN Women, 2017), indicating a strong underrepresentation of rural, Jordanian women in these processes and the need for gender-responsive climate change mechanisms and governance. The report on the project highlights how expertise and field knowledge of rural women remains unrecognized and undervalued at the policy level and not taken into consideration for the design of adaptation plans (ibid.).

Additionally, though numbers are increasing, women are sorely lacking in political representation. According to an assessment conducted by the Organization for Economic Co-Operation and Development (OECD) (2018) on women’s political situation in Jordan, women represented 6.4% of the House of Representatives and 12.7% of the Jordanian ten years ago; while today they make up 15.4% of both houses of parliament (OECD, 2018). Figure 2 presents the trends on women’s representation in Jordan’s House of Representatives from 1989-2016. The proportion of women in municipal in governorate council seats is also at an unprecedented 28.8%, and in 2017 elections, a female candidate for local council has received the highest number of votes in the country (ibid.). The introduction of legislated quotas for women in municipal (2003) and national decision-making bodies has played an important role in increasing women’s political participation, contributing, especially, to empower rural women in Jordan to run for elections for the first time (ibid.). According to data from the United Nations Development Programme (UNDP) on the 2016 Parliamentary Elections in Jordan, women candidates made up 21.4% of the total candidates.

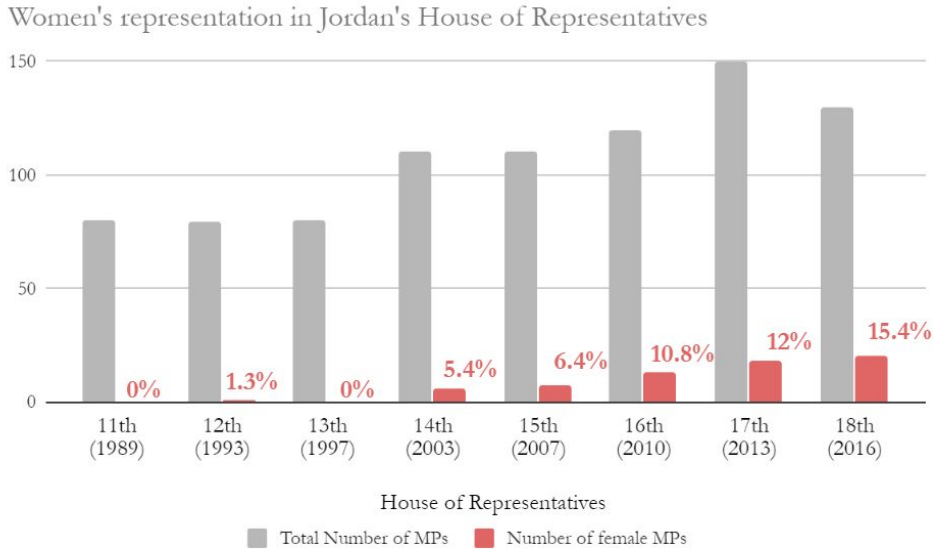


Figure 2. Women’s representation in Jordan’s House of Representatives. Adapted from OECD, 2018.

Although increasingly represented and politically involved, women still face specific challenges in exercising influence and occupying political office. Various obstacles include: restricted access to financial resources, curbed civil barriers, gender stereotypes and traditional social roles (OECD, 2018). In interviews conducted by the OECD with parliamentary women, barriers such as exclusion from leadership positions, nomination to soft-portfolios and higher levels of media surveillance have also been reported, as well as tensions between their family responsibilities and political participation. Politics is still mainly perceived as a male domain in Jordan, with the



socially determined domestic role of women inhibiting their capacities and opportunities to participate politically.

Despite higher levels of women’s participation in the political sphere, there still exist many challenges in achieving gender equality in Israeli politics. According to data from the OECD, the percentage of women parliamentarians in Israel, though low, has been increasing in the last decade, from 20% in 2012, to 27.5% in 2017 (OECD, 2017), and the record of 30% in 2018 (Saragust, 2019). In comparison to other OECD countries, Israel has ranked 20 out of 35 on female representation in the Parliament, demonstrating the gap between Israel and other similar countries.

The female perspective is also specifically lacking in international climate policy-making. WEDO, a global advocacy organization, reviewed the official participants lists for the United Nations Convention on Climate Change (UNFCCC) meetings from 2008 to 2018. The reports indicate that some progress has been achieved in the past years but with large differences between regions and countries (figure 3).

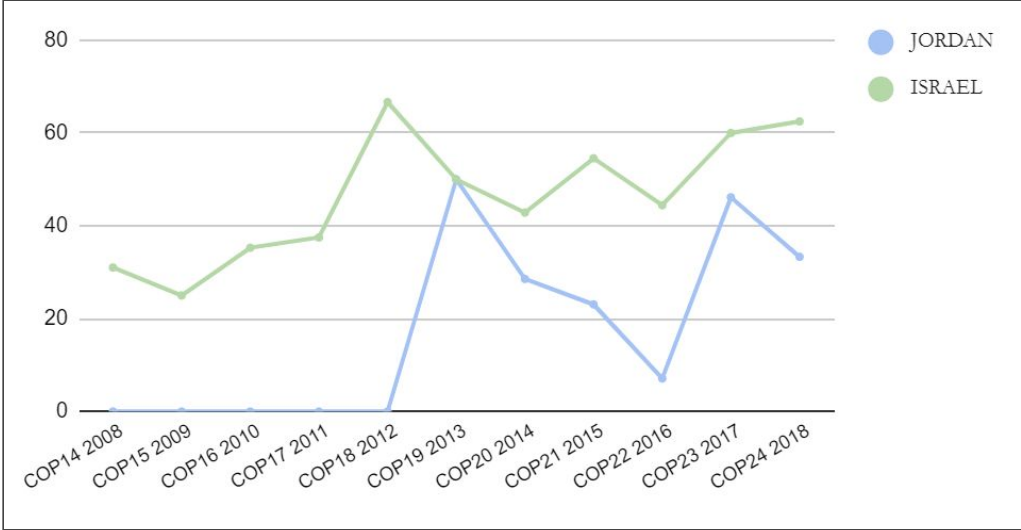


Figure 3: Percentage of women in delegation - Conference of the Parties (COP) 2008-2018

According to the data, the first time a woman participated in Jordan’s delegation at the COP was in 2013, at COP19 in Warsaw (WEDO, 2019). Women have been accounted as members of Israel’s delegation at the COP since the beginning of the study in 2008 and the data shows a positive trend in women’s participation. The report by WEDO has highlighted Israel as one of the most gender-balanced delegations in 2016 (ibid.), though, there is much room for improvement to include Jordanian women.

In a study developed by the Women Studies Unit at the Ministry of Water and Irrigation of Jordan, interviews and surveys were conducted with women and men working in three water entities and three companies undertaking the governance and operation of water and sanitation

services in Jordan (USAID, 2019). The results of the study reveal the weak representation of women in the sector with female employees constituting only 11% of the total workforce (USAID, 2019). Gender disparity is observed also with regard to leadership and supervision positions, of which only 17.5% are held by women in the Jordanian water sector (USAID, 2019). Moreover, gender stereotypes discussed during the interview are important to note: 53.6% of the men interviewed during the study believe that women need to develop their skills and abilities to be able to reach senior positions in the sector; and 49% have agreed that female workers have moderate ability to perform the same functions as efficiently as men (USAID, 2019).

### **Material inequalities:**

Evidence shows that the capacity to cope with and the potential to recover from climate shocks, such as a sudden shortage of water, is highly dependent upon “access to material and productive resources such as income and employment” (Masika, 2002). Frequently, it is the case that in the event of a climate-shock, domestic and care responsibilities expected of women and girls increases, and it becomes even more difficult for women and girls to seek income-generating activities (ibid.). As demonstrated above, women and girls (particularly in Jordan) have limited employment opportunities when compared to their male counter-parts. Below will be discussed women and girls’ unequal access to income, as well as other material inequalities.

The gender pay gap in Israel and Jordan subjects women and girls to material inequalities. In Jordan, although there is a high education attainment for women, women’s participation in the labor market is still undermined by a series of barriers. Women in Jordan are, in many cases, paid below the minimum wage. The average monthly wage for women is JD 359 [US\$ 505,99], compared to JD 403 [US\$ 568,01] for men (World Bank, 2018). In the Jordanian private sector, the gap is even larger, with men earning as much as 40% more than women for the same job positions (ibid.). In Israel, 84% of tertiary educated women have a job, as opposed to 90% of similarly-educated men; and the same Israeli women earn only 66%, or two-thirds, of their male counterparts’ incomes (OECD, 2016). The median monthly gross income of a male worker in Israel stood in 2018 at NIS 9,207 (US\$ 2,654), while the median female worker earned NIS 6,782 (US\$ 1,955) (Jerusalem Post, 2019). Female-headed households in rural Jordan make up the majority of the poorest populations in the country. For instance, 9.1% of female-headed households in Jordan are food-insecure, and 5.7% for male-headed households (UN Women 2016).

This income inequality does not only entail higher risk for women and girls in the event of a water shortage shock, but also leaves less room to pursue decision-making roles, as well as other non-paid activities that could increase water security and prevent resource exploitation, like environmental activism, democratic participation, and the fulfillment of sustainable lifestyle practices.

## **7 Discussion and conclusions**

In sum, the ecological problems specific to Israel are the threats that climate change poses to the evaporation of Lake Tiberias (and salt-water intrusion) as well as evaporation of the Dead Sea (resulting in mudflats, landslides, sinkholes). These two lakes are already the lowest lakes in the

world. The ecological problems specific to Jordan are the downstream location of the country. This a disadvantage given the pollution of the Lower Jordan River and the effects of reduced precipitation most harmful for downstream riparian states. Additionally, climate change will increase the likelihood of droughts, which is especially harmful for downstream riparian states. The political focus points for Israel should be the continuation of cooperation with Jordan on the Red Sea-Dead Sea Project. Additionally, Israel must consider developing plans for less energy-intensive water infrastructure. Currently, desalination, as well as diverting water uphill from Lake Tiberias via the National Carrier pipes, are very energy-intensive. Jordan's political focus points should be on reducing groundwater exploitation, increasing investment in water infrastructure, as well as on cooperation with Israel on the Red Sea- Dead Sea Project. Though resource tension has the potential to intensify existing conflict, it also has the potential to increase cooperation and improve diplomatic relations. We see this as a possibility for Israel and Jordan, especially with regard to the Red Sea-Dead Sea Project. Additionally, Jordan's water management plans should take climate change predictions into greater account.

The critical points of gender-sensitive action for Israel to address are increasing political representation and participation of women, as well as increasing the protection of Arab women, in particular Palestinian women. We see this point of critical importance to the ongoing Israel-Palestine conflict. The critical points of gender-sensitive action for Jordan to address are increasing the number of women in the labor market as well as the number of women holding political office (as with Israel), and also the number of women represented at international climate conferences. In addition, Jordan should focus on providing more access to clean, fresh water for women and girls at refugee camps in Jordan, although we recognize this as a massive physical challenge.

Altogether, women and girls in Israel and Jordan need more representation in the political sphere and in the labor market, more leadership positions and access to decision-making processes in climate adaptation and mitigation plans, equal material resources like income, protection from intersectional discrimination, and support for their female biological functionings. These improvements in gender equality are inextricably linked to water security, and therefore the climate, and should be taken into account when developing gender-sensitive national climate plans and all other national and local policies.

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