

# Environmental and Climate Justice in Palestine

Jad Isaac<sup>1</sup>, Jane Hilal<sup>2</sup>

<sup>1</sup>Applied Research Institute-Jerusalem (ARIJ) Society, Bethlehem, Palestine

<sup>2</sup>Water and Environment Department, Applied Research Institute-Jerusalem Society (ARIJ) Society, Bethlehem, Palestine

Email: jad@arij.org, jane@arij.org

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## Abstract

To have a clean, safe, and functional environment is not only essential for the purpose of preservation, but also imperative for safeguarding the most fundamental of human rights. Resolution 45/94 of the United Nations (UN) General Assembly also stresses and acknowledges that: “all individuals are entitled to live in an environment adequate for their health and wellbeing” (United Nations Digital Library System, 1991). Environmental and climate justice, which: “emerged in the context of the local environmental struggles of directly oppressed groups”, is a global movement dedicated to ensuring equal protection of people’s human rights (i.e., water, health, life, etc.) in the face of the climate crisis. Moreover, health, environment and human rights are part of the 2030 agenda (in particular, SDG 1, SDG 5, SDG 6, SDG 7, SDG 13, SDG 16, SDG 17). Individually, both environmental and climate justice are rooted in an intersectional outlook, by which they highlight the common threads between communities and the people’s inclusion, irrespective of race, class, or gender, in the pursuit of justice. On the other hand, they recognise and acknowledge the role and consequences of climate change in economic, social, and political dimensions; thus, drawing emphasis on the rights of people under the emerging inequities. In the case of Palestine, the Palestinian community is increasingly becoming vulnerable to these effects and the resulting inequalities of climate change. This vulnerability stems from: 1) The right to life; clean WASH; equitable work opportunities; access to resources; and free movement; are all examples of human rights that the Israeli colonial regime infringes upon; 2) Infrastructure is essential for climate adaptation: 61% of the West Bank is ultimately barred from building infrastructure (B’Tselem, 2019) and Gaza Strip has major gaps in infrastructure due to intentional destruction by Israel; 3) Palestinian deprivation of the sovereign right to natural resources by Israel; 4) Apartheid system in water accessibility:

Israeli water usage per person is over three times higher than that of Palestinians (their usage is under the WHO recommended minimum per day) (B'Tselem, 2023); and 5) Violent settler attacks. In 2022 alone, the Applied Research Institute-Jerusalem (ARIJ) recorded 1527 settler attacks that targeted land, properties, livestock, agriculture and even Palestinian civilians. The ongoing neglect of these concerns and the persistent colonization of Palestine by Israel unequivocally and unwaveringly affect the human rights of Palestinians. The power dynamics at play especially hamper the Palestinian ability to exercise and fulfill their inalienable human rights and to tackle the obstacles to justice in their environment.

## Keywords

Environmental Degradation, Climate Change, Environmental and Climate Justice, Human Rights, Causes and Solution

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## 1. Introduction

Israeli settler colonialism has led to ongoing Palestinian struggle for power and dignity, while simultaneously enabling land seizures, the expansion of settlements which are rendered illegal under international law (Fourth Geneva Convention, 1949), and the theft of valuable resources. The use of violent colonial tactics by Israel resulted in the misappropriation of water resources and caused significant environmental degradation. These actions have also erected unjust barriers, impeding the movement and violating rights and indigeneity of Palestinians in the process. Palestinians have diligently passed indigenous knowledge from one generation to the next, guiding them in the preservation of their environment and application of suitable methods of cultivation. However, the ancestral farming techniques deeply rooted in Palestinian knowledge, along with the land itself, are confronted with significant water stress and the imminent risk of being obliterated due to settler colonialism. Israeli colonization solidifies and places environmental and health burdens on Palestinians through the enforcement of unjust policies, laws, and military orders, which have implications on human rights protection and justice in Palestine. The Israeli regime's economic and political exploitation of Palestine leaves Palestinians with limited power and resources to address climate change challenges and achieve a sustainable and healthy community. The exposure of Palestinians to environmental disparities and inequities will continue to elevate health threats and vulnerability to environmental hazards (United Nations Palestine, 2022). Over 50% of the population are highly vulnerable to environmental and climate risks, though Palestine contributes less than 0.01% in global gas emissions (United Nations Country Team, 2022).

Palestine is growing more and more susceptible to the effects of climate change. These issues, including the indigenous Palestinian community's: "Polit-

ical and economic marginalization, loss of land and resources, human rights violations, discrimination” (United Nations, 2007), are expected to compound as the coping capacities of Palestinians are impeded with Israel’s settler colonial domination and violence. The scarcity and curtailed management of water resources and geographic mobility, along with the political and strategic control exerted by Israel over land, are anticipated to intensify environmental challenges faced by Palestinians (United Nations, 2022). *This paper aims to examine pressing human rights issues that must be recognized and addressed for Palestine to attain environmental and climate justice. It emphasizes the significance of sustainably managing natural resources to halt degradation and safeguard the environment, ultimately ensuring the enjoyment of rights. The analysis is framed by three Climate Justice Principles (Mary Robinson Foundation, 2008), and two Environmental Justice Principles (People of Color Environmental Leadership Summit, 1991).*

## 2. Key Principles of Climate Justice

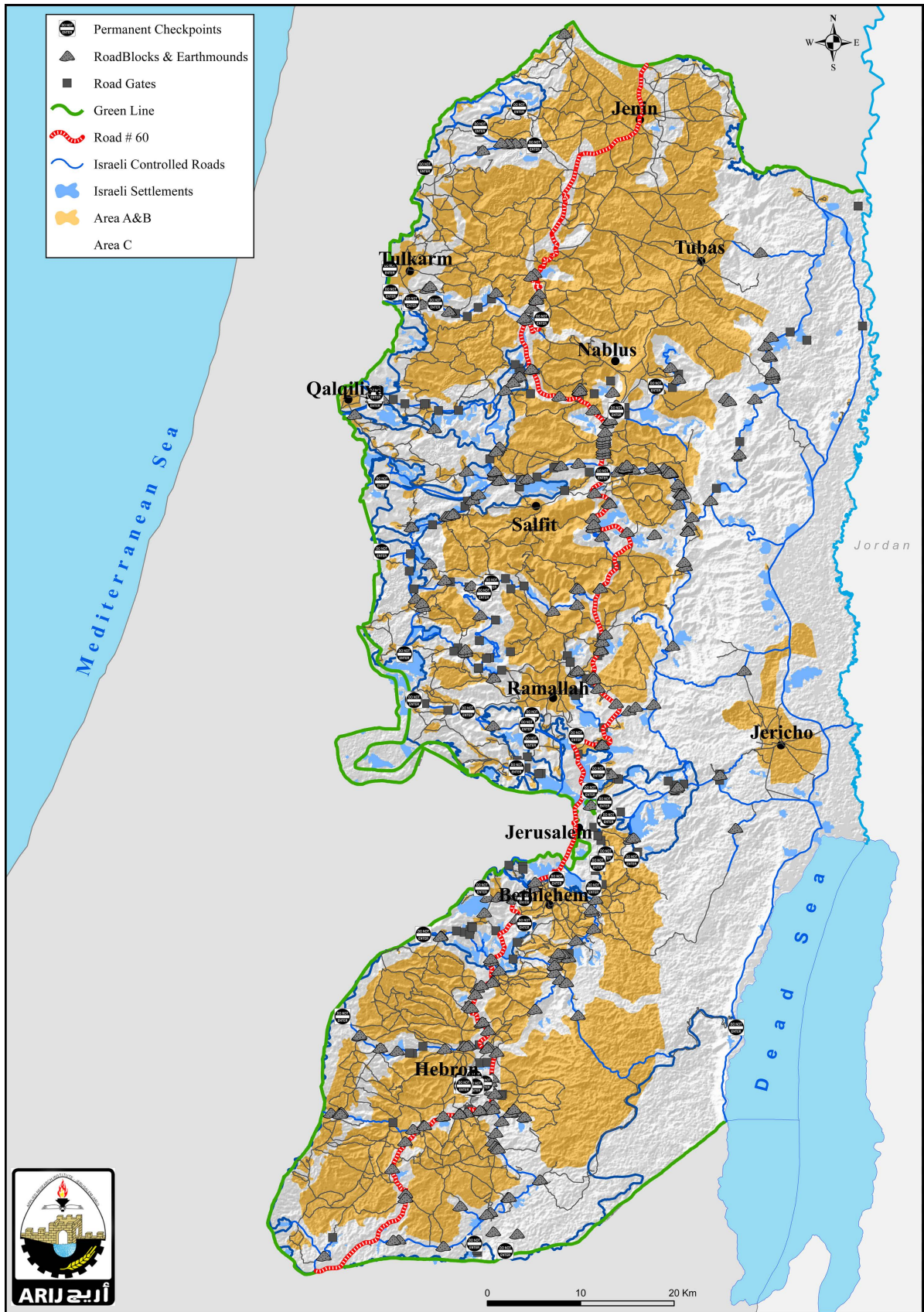
The *Principles of Climate Justice* use a lens of human rights to guide and identify equitable and effective climate action and solutions (Mary Robinson Foundation, 2008). These principles address the unequal impacts of climate change on vulnerable, resource-challenged, and marginalized groups, while advocating for those affected by the injustices associated. In addition, Climate justice, while emphasizing socio-political considerations, faces challenges as the most vulnerable, in this case Palestinians, often do not possess the agency required to ensure sustainable transitions and effective adaptations associated with climate change due to settler colonialism.

### 2.1. Respecting and Protecting Human Rights

Indigenous and colonized groups fighting for their basic human rights are frequently denied autonomy and face resource constraints, which acutely limit their ability to emphasize and achieve environmental conservation in their community. In Palestine, addressing human rights abuses stemming from Israeli colonization is crucial for climate justice, development, freedom, adequate living standards and dignity.

#### 2.1.1. Right to Freedom of Movement

Article 13 of the Universal Declaration of Human Rights (UDHR) stipulates: “Everyone has the right to freedom of movement and residence within the borders of each state” (United Nations, 1948). The right to freedom of movement, enshrined in the UDHR and reflected in the International Covenant on Civil and Political Rights (ICCPR), However, Israeli colonial rule imposes restrictions in Palestine, hindering safe and unrestrained travel, violating the inherent right outlined in international declarations. The regime’s measures include the deployment of more than 700 physical movement impediments in 2023 (Map 1) permanent or flying checkpoints, earth mounds and walls, road gates, and other



Map 1. Internal Physical Restrictions in the West Bank, 2023.

similar structures across the West Bank (OCHA, 2018). Israeli mobility restrictions, not only disregard international law but also have a detrimental impact on the climate and environment in Palestine

The associated infrastructural and procedural delays faced by Palestinians lead to increased economic costs, higher energy consumption, and consequently, elevated CO<sub>2</sub> emissions and pollution. Based on ARIJ Report “Assessing the Impact of Israeli Movement Restrictions on the Mobility of People and Goods in the West Bank” annually, a total of 60 million hours of time are lost due to barriers to movement, resulting in economic losses of up to \$274 million. Additionally, the various obstacles contribute to wasteful fuel consumption of \$135 million and the emission of approximately 196,000 tons of CO<sub>2</sub> into the atmosphere. Significant to this, the transportation sector, responsible for the movement of goods, encounters regular restrictions and lengthy stop and search processes, as well as prolonged waiting times at checkpoints and road gates. These factors have resulted in the sector’s inevitable contribution to 72% of CO<sub>2</sub> emissions (ARIJ, 2019).

At the same time, Israel’s expropriation of large swathes of land and the subsequent isolation of Palestinians lead to a reduction in the availability of fertile and grazing land. This is compounded by Israel’s *de facto* and *de jure* confiscations and their restrictive measures. Mechanisms such as permit system, military orders, the designation of military and seam zones, the separation barrier (*de facto*), as well as court rulings and legislative orders (*de jure*), aim to severely restrict and prohibit Palestinian ownership and management of land (BADIL, 2015). These constraints exacerbate climate threats like desertification and hamper Palestine’s ability to effectively adapt to climate change (Al-Haq, 2019). The expansion of the Separation Barrier, which is facilitated by the *de facto* annexation and fragmentation of Palestinian land, has had significant implications, including a heightened risk of desertification. The construction of the barrier has rendered approximately 10% of arable land and 73% of West Bank’s agricultural area inaccessible to Palestinian farmers (Palestine Economic Policy Research Institute, 2021). Moreover, Israeli expansion colonies sets a precedent for these restrictions and land grabs, designating rangelands as military zones, leading in the confiscation/destruction of 80% of grazing land (Ghattas, 2014). Diminished open spaces challenge traditional agriculture vital for preventing soil erosion. Limited resources force Palestinian farmers to overexploit remaining areas, risking degradation and disrupting vegetation cover. This contributes to desertification (Al-Haq, 2019), threatening agricultural productivity, biodiversity, and ecosystems in Palestine (Figure 1).

### 2.1.2. The Right to Water

#### 1) Overview

One fifth of the world’s population, or 1.2 billion people, live in areas of water scarcity, and this is projected to increase to 3 billion by 2025 due to climate change and populations growth. The State of Palestine lies within the Mediterranean

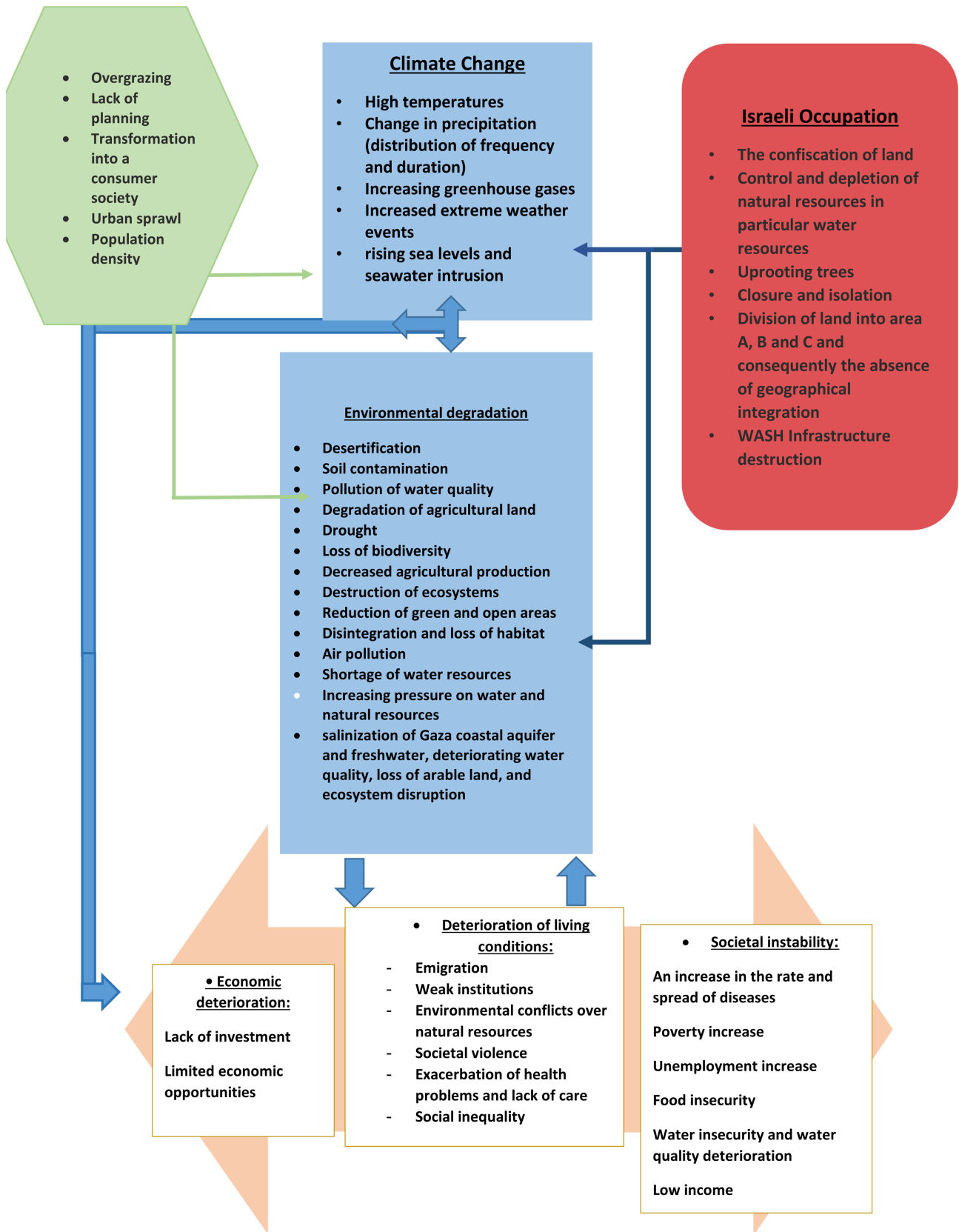


Figure 1. The Relationship between climate change, Israeli colonial activities and land degradation.

climatic zone. Gaza Strip, in particular, is part of the Mediterranean coast. The climate is characterized by long, hot, dry summers and short, cool, wet winters. Only the southern part of the Jordan Valley has a different transitional climate between dry steppe and the extreme desert conditions of the Dead Sea region. In the state of Palestine: 1) The rainy season usually starts in the middle of October and continues up until May, where most of the rain falls during the period between November and March. In the West Bank the average annual rainfall is 535 mm. In the Gaza Strip, the average annual rainfall is 359, and 2) Temperature is relatively high. During summer months, June to August, the mean monthly temperatures in the West Bank range between 20.8°C and 30°C. In winter, December to February, the mean monthly temperatures in the West Bank range from 8.7°C to 14.7°C. In Gaza Strip the average temperatures range between 25°C in summer to 13°C in winter. Over time water shortage in Palestine will increase and become a greater problem as a result of population growth, higher standards of living, expected climate change, and above all, Israeli practices and restrictions imposed on both the water resources and its sector's development.

## **2) Impacts of Climate Change on Surface Runoff and Groundwater Recharge**

The impacts of projected future climate change on surface runoff are exemplified in a study by Peleg, Shamir, Georgakakos, and Morin (2015). Peleg et al. (2015) modeled the impacts of climate change on the hydrological regime for two watersheds in the region for the RCP4.5 and RCP8.5 scenarios. They found that a reduction in rainfall by 15% and 18% would respectively result in a reduction in mean annual streamflow volumes by 45% and 47%. The amplification in reduction of streamflow volumes relative to rainfall amounts is related to the projected reduction in soil moisture which results from fewer rainfall events and longer dry spells between rainfall events during the wet season. This amplification event is evident in streamflow estimations under the current climate. For instance, total annual stream runoff volumes in Wadi Fara'h during the dry year 1998/1999 was estimated at 5.84 MCM compared to 14.32 MCM during the wet year 1991/1992 (Gunkel, et al. 2015). Based on these data, it is highly likely that the projected reduction in precipitation will almost half the average annual total water runoff volumes in the ephemeral streams of the West Bank thus reducing the potential of available runoff water from 196 MCM/yr to less than 100 MCM/yr by the year 2100.

Surface runoff in the Upper Jordan River Catchments of the Dan, Hasbani, and Banyas are also projected to decrease. Smiatek and Kunstmann (2015) used meteorology input from five dynamical downscaling experiments EURO-CORDEX and MED-CORDEX applying the RCP4.5 scenario. They performed hydrological simulations using the physically based distributed hydrological model WaSiM. The applied CORDEX models revealed increasing annual mean temperatures, 1.8 K above the 1971 - 2000 mean and 2.6 K higher for 2071 - 2100. The simulated ensemble mean precipitation projected an average reduction by 16.7% for 2031—60 and 22.1% reduction at the end of the century with the highest re-

ductions—30% occurring in the spring season. Related to the 1976 - 2000 mean value, the discharge of the UJR was simulated to decrease by 7.4% for 2031—60 and by 17.5% for 2071 - 2100. Note that these results were obtained using the RCP4.5 scenario. The two higher GHG emission scenarios RCP6.0 and the RCP8.5 scenarios will most likely result in higher reductions in precipitation in the Dan, Hasbani, and Banyas and therefore will also most likely result in further reduction in water flow in the UJR. For instance, regional downscaling experiments in Alpert, Krichak et al. (2008) and Samuels et al. (2011) indicate possible reduction in precipitation of 30% by then of the century.

Climate change also influences groundwater systems both directly through replenishment by recharge and indirectly through changes in groundwater use. Over time, recharge is strongly influenced by climate variability—including climate extremes (droughts and floods). However, Land-surface models (LSMs), embedded in GCMs and RCMs, have neglected hydrological processes below the root zone such as deep percolation and lateral groundwater flow. While there has been recent attempts to couple more complete groundwater models to LSMs (Kollet & Maxwell, 2008), such models have not been employed yet to evaluate potential impacts of climate change on groundwater recharge for the groundwater aquifer systems in Palestine. Despite the lack of model simulations, it is likely that the projected reduction in precipitation along with higher interannual and intra-annual precipitation variability (e.g. long droughts and intensification of rainfall events) will, overall, reduce groundwater recharge (Samuels et al., 2011) while increasing interannual variability in groundwater recharge rates.

Historical data on precipitation and spring discharge provide further support to the argument in Figure 2 (Samuels et al., 2009). Figure 2 relates total annual

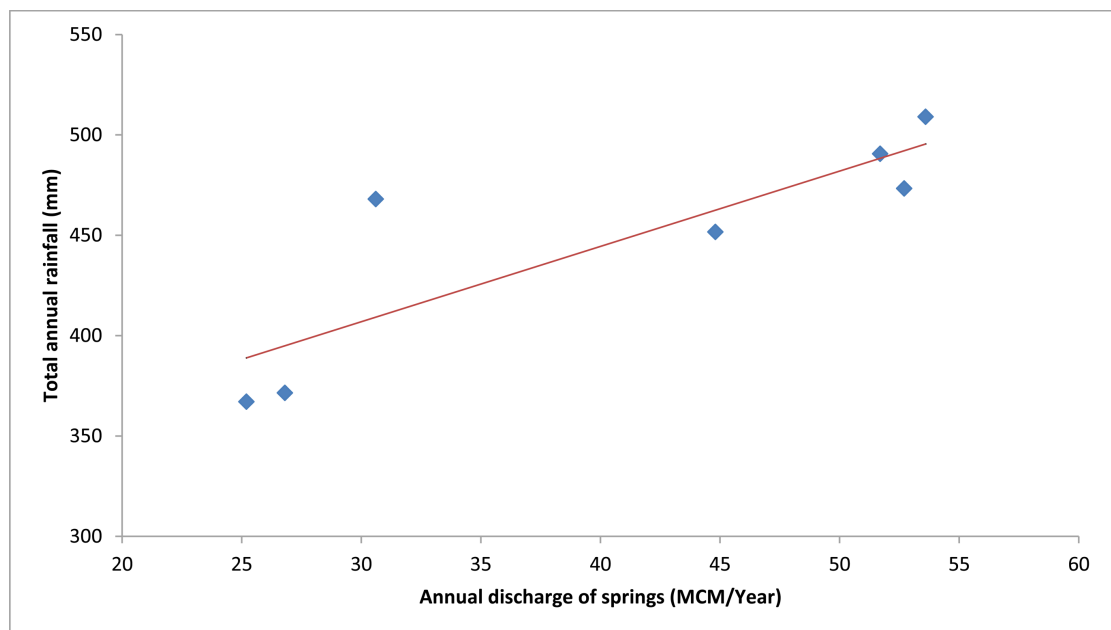


Figure 2. Climatic variability compared to the annual discharge of spring.

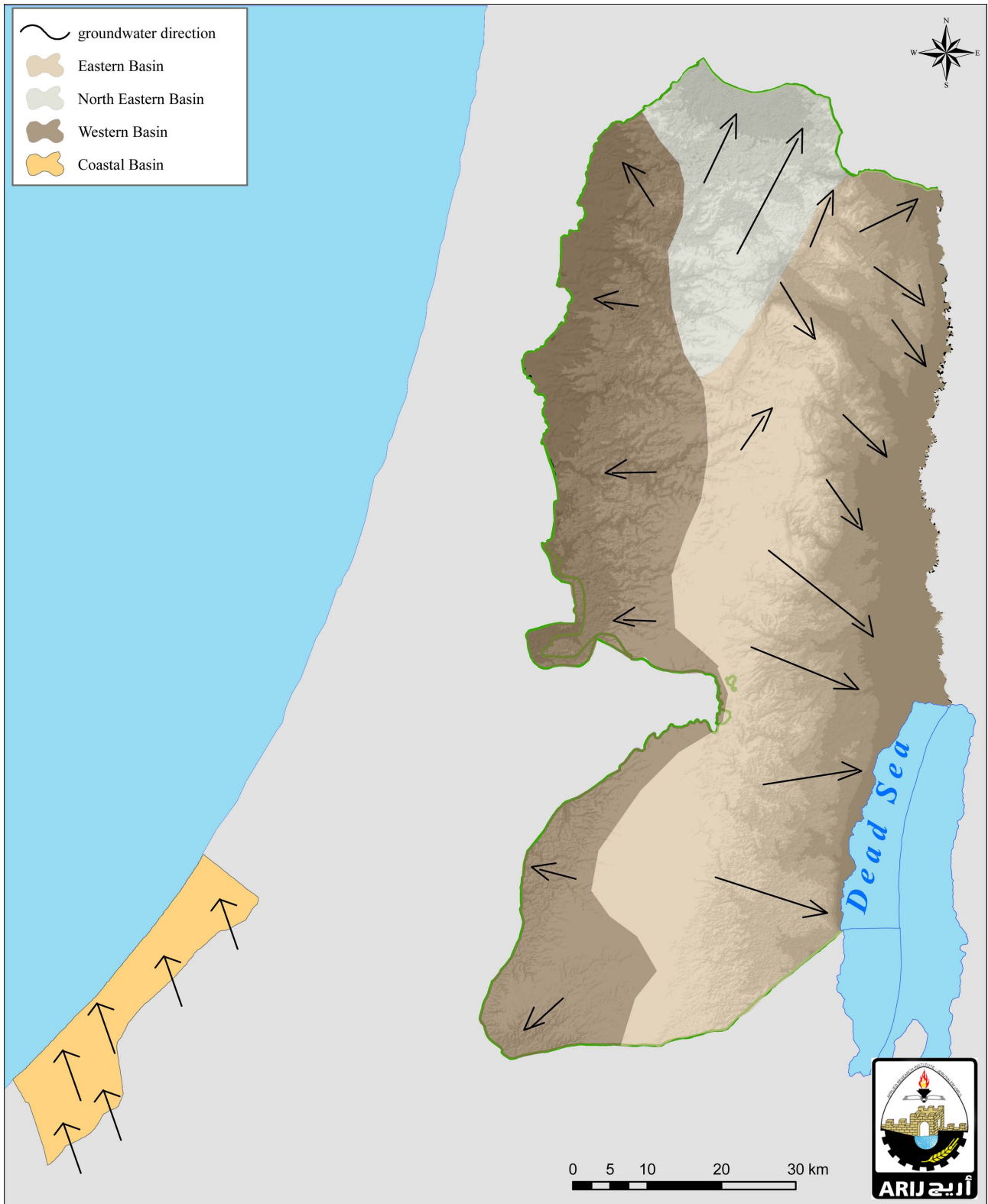
rainfall to the quantity of water that is discharged from springs. Below average annual precipitation resulted in significant reductions in spring discharge. Reductions in spring water discharge indicate lowering of the groundwater table especially when abstraction rates exceed recharge rates.

### 3) Water Right

In 2010, the UN General Assembly recognized safe drinking water as a fundamental human right United Nations General Assembly (UNGA), echoed by the Human Rights Council and CESCR. Emphasizing universal access, they stress water's availability in sufficient quantities, free from interference (United Nations General Assembly, 2010) and accessible to all without discrimination, aligning with WHO guidelines (UN-CESCR, 2000). However, within the Palestinian context, the enjoyment and implementation of this basic human right are constrained by the colonial Israeli regime, which exercises dominant control over the already scarce water resources in the region. Israeli actions, including restrictions and takeover have led to a decrease in groundwater availability and supply, and increased over extraction, impacting 5.3 million Palestinians in the West Bank and Gaza Strip (PCBS, 2018). Starting in 1948, Israel began unilaterally appropriating and depleting key water resources and infrastructures in Palestine, establishing them for exclusive Israeli settler use. Palestinians rely on three main sources of water: the Jordan River, the coastal aquifer, and the mountain aquifer which is composed of three major water basins, namely the Western, Eastern and the North-Eastern basin (PWA, 2010), all of which subsequently fell under the military jurisdiction of the Israeli colonial regime in 1967 (Map 2).

Although the Jordan River is considered a shared water source between Israel, Lebanon, Syria, Jordan and Palestine, its waters are exploited in contravention of international water law due to Israel's dominance of shared water sources in the region to meet its water needs without taking into account the requirements of other riparian states. As a power in the region, Israel was able to violate the water rights of the countries bordering the Jordan River, especially Palestinian rights, as demonstrated by the Johnston plan, which called for the construction of the western Ghor canal to provide Palestinians with their share of the river's Water, estimated at 250 million cubic meters per year. Although the Johnston plan was approved by the riparian technical committees, it was not implemented on the ground and the water of the Jordan River was exploited through projects carried out unilaterally without adhering to the water quotas set (Table 1) (Soffer, 1994). Among the most prominent of these projects is the National water carrier through which Israel diverts water from Lake Tiberias to the Negev desert in addition to the Jordanian eastern Ghor canal, which caused a decrease in the amount of water discharged into the river from 1250 million M<sup>3</sup> in the year at the beginning of the fifties to no more than 50 million M<sup>3</sup> in a year of low-quality water and high salinity.

The water crisis in the Occupied Palestinian territory is not only the number of resources available, but also the policy priorities of the state of Israel. The



**Map 2.** Groundwater basins in the west bank and Gaza strip.

Palestinian share of water, which has not changed since the signing of the Oslo agreement, which amounts to 118 million M<sup>3</sup> According to the agreement, de-

spite the doubling of the population from 1994 to 2021 in addition to the needs in other development sectors such as agriculture and industry, was limited. Israel is still consuming about 85% of the amount of renewable water annually in underground basins while the amount of water consumed by Palestinians does not exceed 15% of this renewable amount (**Table 2**) (PCBS & PWA, 2022).

Building permits for such WASH infrastructure for Palestinians in Area C (61% of the West Bank) are reported to have a 98.5% rejection rate from the Israeli Civil Administration (PCBS & PWA, 2022). Since 1967, Israel has controlled 55% of the West Bank and 22% of Gaza, inaccessible to Palestinians. The Oslo Accords in 1993 allocated 22% of historic Palestine to the PLO for a future Palestinian state. However, final status negotiations did not occur, leading to an interim division into three areas (A, B, and C) with varying levels of control as

**Table 1.** Water quotas for countries bordering the Jordan River based on the Johnston plan 1955.

State	Water ration (MM <sup>3</sup> /Year)	Current usage (MM <sup>3</sup> /Year)	Variance (MM <sup>3</sup> /Year)
Syria	132	153	+21
Lebanon	35	7	-28
Jordan	720	480	-240
Israel	400	647	+247
Palestine	250	0	-250

**Table 2.** Water sources in Palestine.

Water source	Rate /million cubic meters per year ***	Notes
Rate of water extraction from the North-East Basin, East Basin and West Basin* West Bank	113 - 140	In 2019, the amount of water extracted from these basins amounted to 122 m <sup>3</sup>
The rate of water extraction from the Sahelian Basin** in the Gaza Strip	167 - 170	This amount is considered an unfair pump, so 97% of it is not potable due to the interference of sea water, the rise in pollution rates and the prevention of lateral runoff by Israeli Wells surrounding Gaza Strip.
Amount of water purchased from Israel Water Company	84.2	Procurement is done to fill the shortfall and provide additional water
Valleys	165	These quantities are not exploited properly
Jordan River	250 - 300	Under full Israeli control

\*The annual renewable recharge rates for these basins range from 778 - 814 million M<sup>3</sup>;

\*\*Renewable annually in the amount of 55 - 60 million M<sup>3</sup>; \*\*\*For the years 2017-2018-2019.

outlined in the Oslo Accords. These areas, as outlined in the Oslo Accords, are characterized by varying levels of control (**Table 3**).

Consequently, with these discriminatory regulations, water structures continue to be unlawfully demolished by Israel, causing additional water stress for Palestinians. This is particularly in violation of Article 54 of the Additional Protocol (I) to the Geneva Conventions (*Geneva Conventions, 1949*). Solely in 2021, a total of 84 (WASH) structures were demolished in the West Bank, accounting for 10% of the 849 structures destroyed in the West Bank (*WeWorld, 2021*). The damages to sanitation infrastructures and facilities, have caused untreated sewage to flow into residential areas and accordingly contaminate water, further decreasing consumption. The destruction of these vital structures, presence of industrial pollution, and the discharge of untreated wastewater and sewage from illegal Israeli colonies pose a severe environmental and health threat to the Palestinian communities in areas like Wadi Foukin and Nahaleen, which are surrounded by colonies, are dealing with around 3000 m<sup>3</sup> of daily poured wastewater from Betar Illit colony. This expelled wastewater has led to soil degradation and the pollution of approximately 700 dunums of land. Additionally, contamination has rendered two springs unusable, and the confiscation of 26 wells obstructs consumption, agriculture, and municipal purposes for Palestinian communities (*ARIJ, 2014*).

By contaminating and confiscating Palestinian land and water sources Israel reinforces Palestinian dependency on its water companies, namely Mekorot the Israeli water company. This particular colonial strategy involves not only environmental pollution and aggressive resource theft but also capitalizes on appropriated water from Palestinian communities, thereby diminishing the resilience of Palestinian communities against climate change. Currently, Palestine must buy 20% of its water supply from Mekorot (*PCBS & PWA, 2022*), a purchase of about 70 million dollars—putting Palestinians in debt to Israel for the purchase of their stolen water at an inflated price. Combined with the 2.5 million cubic meters of illegally dumped wastewater from illegal colonies (*Medical Aid for Palestinians, 2021*), and the insufficiency of WASH facilities, Israeli colonization limits the Palestinian capacity to address waste management, conserve the environment, and ensure the protection of community health. This violates Article

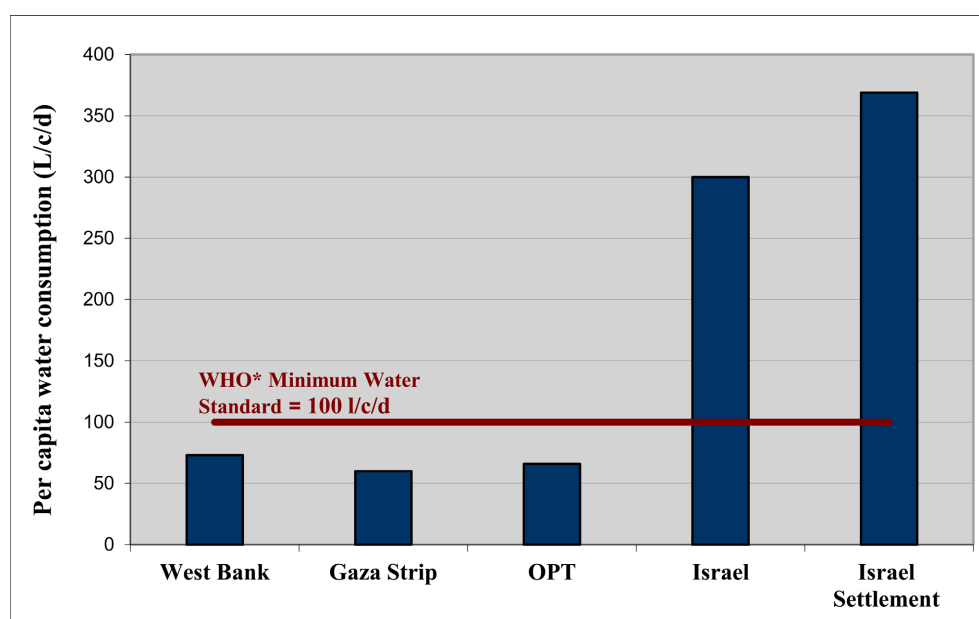
**Table 3.** The Division and Jurisdictions of Areas A, B, and C in the Oslo Interim Agreement, 1994.

Area	Area (km <sup>2</sup> )	%	Jurisdiction
Area A	1004.8	17.8	The Palestinian Authority has complete autonomy over administrative and security issues.
Area B	1035.4	18.2	Palestinians have civil responsibilities, and the Israeli Army has security control.
Area C	3456.4	61.1	Israel has territorial administration with security control over this area and the Palestinian Authority is only allowed to provide some administrative services to the residents.

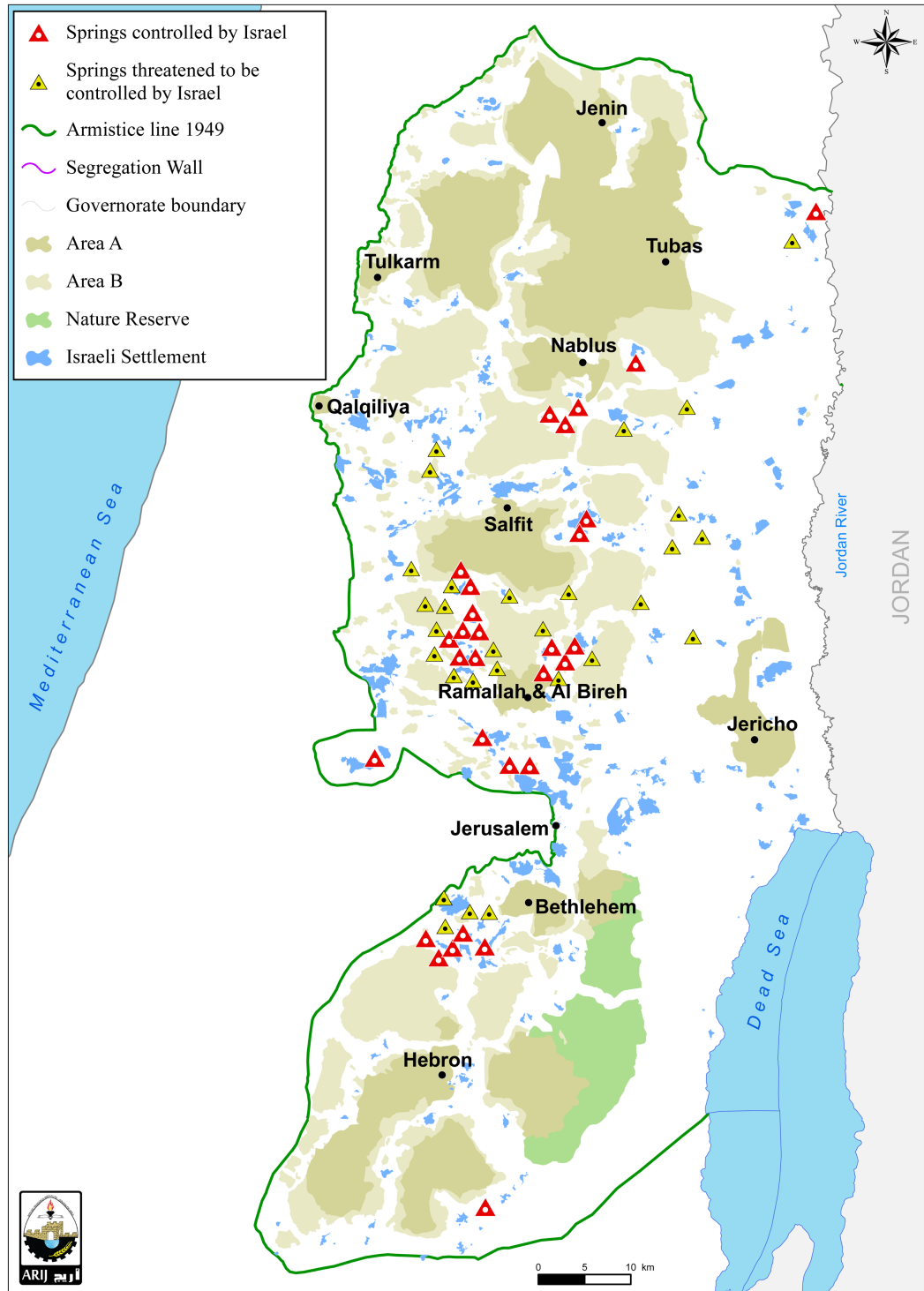
12.2(b) of General Comment No. 14 and Article 12 of the legally binding (UN-CESCR, 2000), Israel infringing on Palestinian rights to water, the highest health standards, and a healthy environment. Additionally, due to the unwavering colonial policies and the prioritization of settler health and water access at the expense of Palestinians', approximately 90% of the pumped water from the aquifers in Palestine is allocated to Israel—leaving Palestinians with access to only 10% of the available water. Accounting for population growth, the available water resources are excessively exploited by Israel, resulting in inadequate water supply for 660,000 Palestinians (United Nations General Assembly, 2021). The daily water consumption for Palestinians is around 50 to 73 liters per day (Action Against Hunger, WASH Cluster, & WeWorld, 2021), which falls below the World Health Organization's recommendation of 100 liters. In stark contrast, Israeli settlers consume over three times the amount of water—around 369 liters of water per day (Al-Haq, 2016) (Figure 3). Consequently, with water scarcity and Israeli sovereignty over resources, Palestinians are subjected to water rationing and face challenges in maintaining their land.

On the other hand, the repeated settler attacks on more than 56 Palestinian water springs in the West Bank constitute a clear violation of international law and a violation of Palestinian water rights. According to a report issued by the UN Office for the Coordination of Humanitarian Affairs in the Occupied Palestinian territory in 2012, "the impact of the Israeli settlers' seizure of Palestinian water springs on the humanitarian conditions of the Palestinians", it was pointed out that 30 springs have been seized and fully controlled, and thus the Palestinians are unable to access these springs (Map 3).

It should be noted that the water springs are considered one of the most



**Figure 3.** Discrimination in Water Availability and Consumption in Israeli colonies and Palestinian Localities.

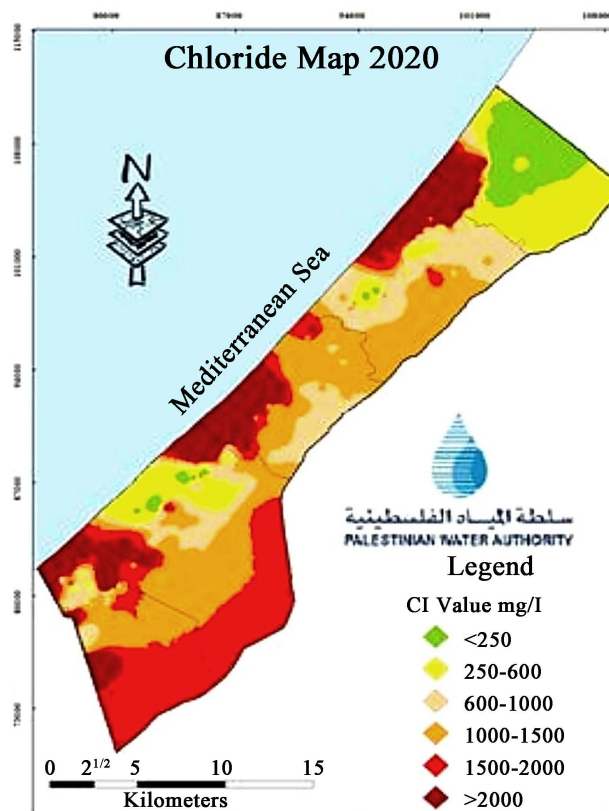


**Map 3.** Attacks on Palestinian Springs by the Israeli occupation.

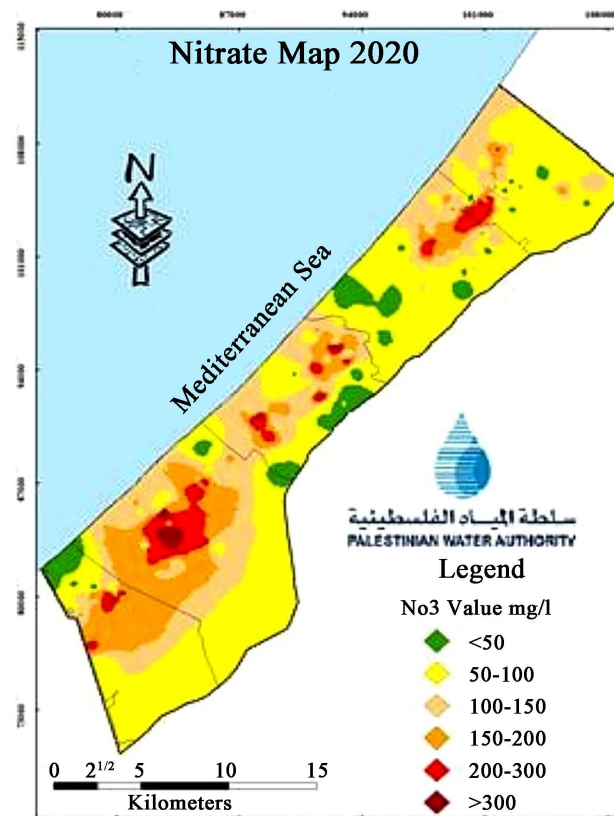
important Palestinian water sources, whether for domestic or agricultural use, where the annual flow of spring water in 2019 amounted to about 40.6 million cubic meters (this figure does not include the group of springs Al-fushkha), so the main goal of the seizure is to confiscate land for settlement expansion and deprive Palestinians of their right to water.

Moreover, Palestinian water sources, particularly the Coastal Aquifer, have been subjected to excessive utilization. In Gaza, this aquifer, which has a safe annual yield of 65 MCM (million cubic meters), is being overexploited at a rate of 125 MCM per year, leading to depletion and seawater intrusion. Consequently, limited water supply from the Gaza aquifer is suitable for consumption, as: “90% - 95% of the water supply is contaminated” (Amnesty International, 2017).

Considering the reality of water issues in the Gaza Strip in particular, the real problem is related to the quality of water. The Palestinian Water Authority confirms that 97.6% of the total water available to the population of the Gaza Strip from the aquifer does not meet the standards of the World Health Organization (WHO), and that only 8 underground wells are potable with an estimated output of 2,285,493 cubic meters. The depletion of the aquifer in the Gaza Strip has led to the influx of seawater into large parts of the Gaza Strip. As a result, salinity levels in the aquifer have increased, reaching unacceptable limits above the WHO-approved concentration of 250 mg/L of chloride in the water, where the concentration in the Gaza Strip reservoir ranges from 200 to 1000 mg/L of chloride, and is expected to increase more as aquifer water continues to deplete (Map 4). The nitrate levels ranged from (100 to 200 mg/L) during 2020, which are high concentrations due to the leakage of wastewater from the sewage network into the aquifer. These concentrations thus exceeded the World Health Organization (WHO) limit of 50 mg/l (Map 5).



**Map 4.** Chloride concentration in the Sahel aquifer in the year of 2020.



**Map 5.** Concentration of nitrates in the coastal aquifer in the year of 2020.

On the other hand, the denial of access to fuel and tools due to the long closure imposed on the Gaza Strip led to the weakening of the ability of (25) water, sanitation and hygiene providers to provide adequate amounts of water, which led to the fact that more than (1.1) million Palestinians in Gaza have not been able to access.

Israeli restrictions on Palestine’s ability to build wells, construct any measures for climate change adaptation such as developing infrastructure for rain harvesting and waste water treatment plant, and obtain equitable shares from existing water resources have enhanced Palestine’s vulnerability to unsustainable water uses and water contamination. In the West Bank alone, Israeli colonial rule has left 180 communities with no reliable, healthy, or sufficient supply of running water (Amnesty International, 2017). On the contrary, Israel has strengthened its economic and political standing by undermining Palestinian water shares. Water is a crucial source of power and dignity, and as Israel restricts Palestinian access to and governance over this key resource, it diminishes their capacity to adequately respond to climate threats.

As a result of this Israeli water policy, the gap between the amount of water available and the increasing demand has widened due to the increasing population and urban development in all Palestinian areas. Still, most of Palestinian areas suffer from the serious shortage of water supplied. During 2019, the amount of water supplied to Palestinians in all West Bank governorates reached

about 119 million cubic meters, and 108 million cubic meters in the Gaza Strip. However, the amount of water required is estimated at 149.2 million cubic meters in the West Bank and 110.6 million cubic meters in the Gaza Strip, based on the globally recommended minimum of 100 liters per day. This means that the actual deficit in the amount of water supplied is more than 64.0 million cubic meters and 53.8 million cubic meters in the West Bank and Gaza Strip, respectively. It is noted that the water sources are not enough to supply the population of the required quantities, so the Palestinian Water Authority resorts to buying additional quantities of water from the Israeli water company (Mekorot) to fill the deficit in the amount of water supplied. It accounted for more than 37% of the total water supplied in 2019.

On the other hand, while Israelis have good infrastructure, Palestinians struggle to have access to a lower level of basic infrastructure and services. Palestinian communities, especially in the area “C” of the West Bank, still lack access to water sources and public water systems, with residents relying on traditional means of access to water, such as buying water by tanks, collecting rainwater or using nearby springs, to meet their water needs. Here we are in 2024 and there are still 10 Palestinian communities inhabited by approximately 25 thousand people who are not served by water networks.

As for the development and management of water sources, the Palestinian Authority has not been able to manage its sources in an integrated manner under the current circumstances. According to Article 40 of the Oslo agreement, all development projects for the water and sanitation sectors within the Occupied Palestinian territories are subject to approval by the Palestinian-Israeli Joint Water Committee. Since its formation, however, the committee has been subject to many criticisms, since the final decision in the Occupied Palestinian areas, particularly in areas (B) and (C) under Israeli control, is ultimately up to the water officer in the Israeli civil administration, who bases his decisions on the authority of Israeli administrations to approve any project. Consequently, the Palestinian side has been prevented from implementing its obligations.

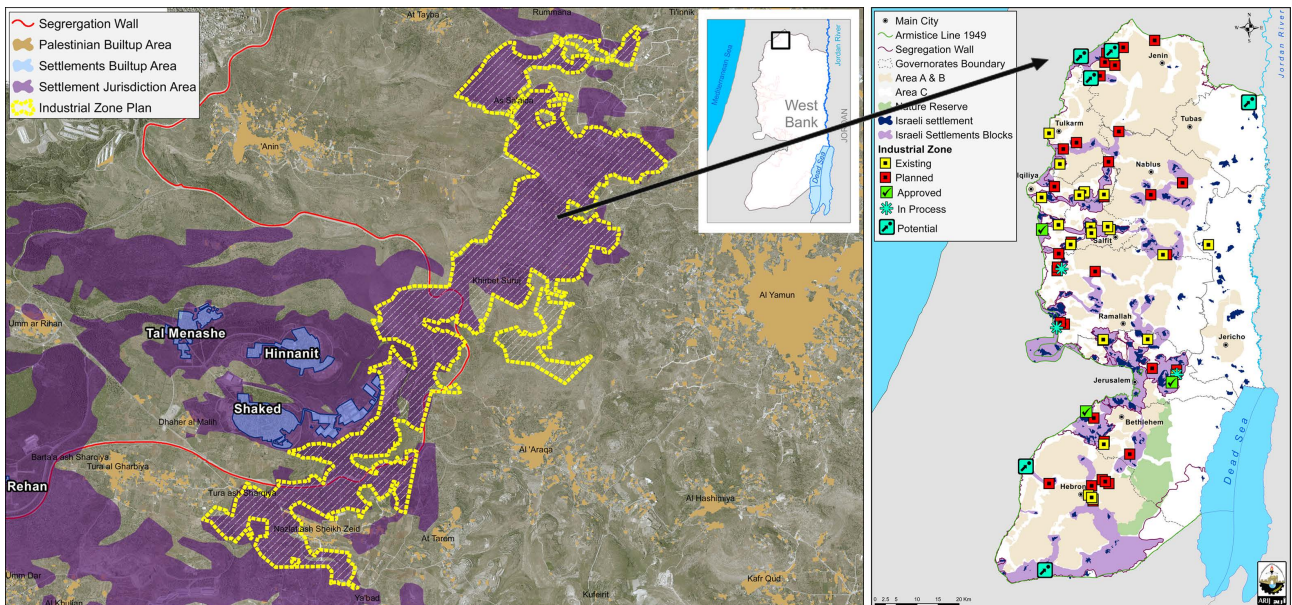
While Israeli water projects for illegal settlements in Palestinian areas do not require the approval of the Joint Water Committee, Israel retained responsibility for water and drainage systems in West Bank settlements during the transition period. Israel also conditioned approval of Palestinian projects on Palestinian approval of settlement projects in the West Bank, which the Palestinians saw as an attempt to legitimize the settlements. For these reasons, the Palestinian Water Authority decided to suspend the work of the Joint Committee in 2010. As a result, work was stopped on a large number of water projects, which at that time exceeded the number of more than 95 projects in a number of Palestinian communities. In 2017, the Joint Committee resumed its work after a break of more than seven years, following the signing in January of the same year of an agreement between the coordinator of the Israeli government’s work in the West Bank and the minister of Palestinian civil affairs, with the participation of the heads of the Israeli and Palestinian water authorities. It was agreed that the

committee will work according to a new working mechanism with the aim of speeding up the implementation of infrastructure projects in the West Bank

### 2.1.3. The Polluter Pays Principle

In order to achieve climate justice and create opportunities that facilitate progress related to climate justice concerns, Palestinians would need access to environmental conditions that enable them to pursue and attain related environmental and SDG goals. Power imbalances with Israel exacerbate pollution exposure, as Israeli industries emit CO<sub>2</sub> without accountability, impacting Palestinian life and health (Nussbaum, 1999). Israel exhibits one of the highest per capita greenhouse gas emissions globally, averaging at 11.4 tons of CO<sub>2</sub> emissions per person and surpassing the Organization for Economic Cooperation and Development (OECD) emissions levels average identified (OECD, 2021). In contrast, Palestinians have considerably lower emissions, not exceeding 0.5 tons of CO<sub>2</sub> emissions annually (Kurzman, 2019). Hence, Israel, as a main contributor to pollution in Palestine, is subject to the application of the Polluter Pays Principle (PPP) as an OECD member. Its responsibility, outlined in the Paris Agreement and Rio Declaration, obligates financial and mitigation actions for greenhouse gas emissions, aligning with Rio Declaration, which incorporated the PPP into its principles in 1992 (UNCED, 1992). Israel violates climate justice and environmental obligations by intentionally polluting Palestinian air and land. With 23 Israeli industrial colonies in the West Bank, including East Jerusalem, covering 19,381 dunums of expropriated Palestinian land. Additionally, there are 35 Israeli plans (Map 6) to establish new industrial areas, covering a total area of 25,073 dunums. These zones do not merely aid in land theft, but also impact the daily lives of Palestinians.

Israel has a longstanding strategy of relocating polluting factories from its



Map 6. Outlining Israeli Settlements and existing, planned, approved, in process, and potential Israeli Industrial Zones.

cities to Palestinian land. Factories shut down in Israeli areas due to environmental violations are reopened in the West Bank. Notably, these factories are intentionally operated when wind carries pollutants towards Palestinian areas but promptly closed when there's a risk to Israeli colonies (Isaac et al., 2015), revealing a deliberate pattern.

The Geshuri agrochemicals company (**Photo 1**) exemplifies Israel's intentional pollution strategy. Originally seen as a threat to Israeli settlers, it was relocated to Tulkarem in the West Bank, impacting Palestinian health and the environment. The factory, established on fertile land with a contaminated aquifer, was unjustly seized from a Palestinian owner, highlighting a broader issue of Israeli settler colonialism. The pollution in the area, has also contributed to Tulkarem having the highest rates of cancer in Palestine (Purkiss, 2014). It is alarming to note that no administrative or judicial orders have been issued against these companies that continue to harm Palestinians communities and the environment.

#### **2.1.4. Decisions on Climate Change: Participatory, Transparent and Accountable**

Israeli colonial decisions in Palestine evidently lack transparency and accountability, impacting Palestinians under the umbrella of environmental preservation. Strategic protected areas, like are considered natural, archeological, and historical areas that, once declared as such, are to be preserved (<https://www.gov.il>), national parks, disproportionately target regions where Palestinians reside, excluding areas with a Jewish population presence. Israel has signed and approved 350,720 nature-related orders, declaring 115 national parks in Palestine (Sasa, 2022). In Jerusalem alone, within the illegally declared municipal boundary, national parks cover 3162 Dunums. Significantly, these parks are frequently employed as a tool to legitimize land grabs and promote the expulsion of Palestinians, thereby aligning with and serving the broader colonial objectives of annexation in the region.

Under settler colonialism, the prospects for transparent and equitable decision-making are improbable, and the oppressed and marginalized group is



**Photo 1.** Israel's Geshuri Factory in Tulkarem.

systematically excluded from participating in such processes. Furthermore, climate justice for Palestinians remains unobtainable and discourse around it is not impactful due to Israeli settler colonialism. Palestinians face ongoing voice alienation and rights violations, reinforcing their subjugation. Designating land as a national park restricts Palestinian access and harvesting rights, contrasting with Israeli settlers who can build and expand under the law. This unilateral decision-making reflects a colonial agenda, excluding Palestinians from national parks without discussion.

In November 2018, the Israeli Knesset passed an Amendment to the **National Parks, Nature Reserves, National Sites, and Memorial Sites Law**, granting authorization to Israeli settlers to carry out expansion projects in a national park located on annexed Palestinian land in occupied East Jerusalem (**European Union, 2019**). Prior to this amendment, building activities were officially prohibited within these areas, at least merely within the Law and to Palestinians (<https://www.gov.il>). Consequently, the amendment legitimizes the annexation of Palestinian land to Israeli colonies, contradicting the notions of natural landscape preservation and “protected areas” that are associated with these national parks. It is indisputable that the related injustices facing Palestinians cannot be divorced from or dismissed in participatory, transparent, and accountable climate change decisions.

### **3. Key Principles of Environmental Justice**

The *Principles of Environmental Justice* advocate for inclusive and collective efforts to address climate change, and empower individuals in decision-making processes (**Crump**) (<https://bencrump.com>). They recognize the unjust impact on oppressed communities and those with low socioeconomic status (**Bullard, 1993**), aiming to provide ecological safety and protection (**Bullard, 1994**). In Palestine, applying these principles involves acknowledging settler colonialism’s impact and safeguarding Palestinians from settler attacks and Israel’s permit regime.

#### **3.1. Affirming the Right of All Workers to a Safe and Healthy Work Environment without Being Forced to Choose between an Unsafe Livelihood and Unemployment (People of Color Environmental Leadership Summit, 1991)**

The aggressions carried out by Israeli settlers against Palestinians, particularly farmers, can be regarded as a form of violence that is not only state-sponsored but also organized and systematic. These settler attacks are an extension of the ongoing Israeli colonial regime, with the intention of targeting Palestinian land and disrupting agricultural activities to further expand their domination and settlements. The methods of violence employed by settlers such as gunfire, uprooting and burning olive groves, and deliberate destruction of crops (**PUI & MDM, 2016**), hinder the ability of Palestinian farmers to sustain their livelihoods and create a constant sense of caution and fear during harvests. Subsequently, the

violent actions of settlers frequently result in large profit and income losses for farmers and their subsequent unemployment. In 2022 alone, there were a total of 12,537 settler attacks (Figure 4) recorded that targeted land, properties, livestock, agricultural and even Palestinian civilians (ARIJ, 2023). The cumulative impact of the violence faced, amounts to approximately 465.6 tons of carbon dioxide not sequestered and a loss of 150.8 tons of olives, equivalent to a market value of \$300,000.

The olive sector plays a significant economic role, valued between \$160 million to \$191 million (OCHA, 2019), is considered a: financial lifeline for approximately 80,000 Palestinian families” (Lorusso, 2022), making these attacks a direct consequence to Palestinian farmers’ well-being and income. As of 2023, approximately 5000 trees across different villages have been damaged by settler attacks.

### 3.2. Guaranteeing the Right to Environmental Protection

Renowned environmental justice advocate Robert Bullard stresses the fundamental right of every individual to be safeguarded against environmental degradation (Bullard, 1994), encapsulated in the concept of “guaranteeing the right to environmental protection”. In the case of Palestine, the Israeli colonial regime restricts Palestinian indigenous knowledge, which plays a crucial role in sustainable agricultural production. By imposing limitations on traditional farming practices, known as “Baladi farming” (Alayassa, 2012), Palestinians are rendered vulnerable to the adverse impacts of environmental degradation. This farming approach abstains from the use of chemicals and pesticides, instead relying on natural fertilizers present in the soil which promotes sustainable development. However, the introduction of industrialized mass farming techniques by Israeli agriculture, along with competition from crops with lower prices from this

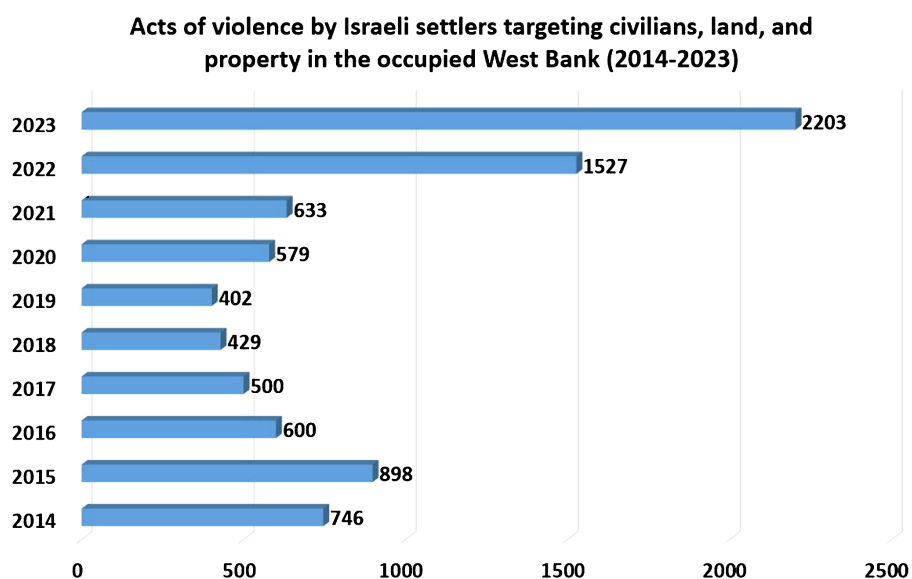


Figure 4. Israeli settler attacks in the west bank, 2016-2022.

unsustainable farming, has had various negative consequences for indigenous Palestinian farming techniques. This departure from Baladi farming not only undermines indigenous techniques but also amplifies environmental degradation, contributing to increased water consumption.

### **3.3. Destruction to Palestine's Biodiversity**

Israeli colonial rule actively legalizes and promotes settler colonial expansion in Palestine, often achieved through the designation of certain areas as military zones or nature reserves—under the pretext of security and environmental conservation. As a result, Palestinians endure disrupted access to their land rights, alongside forced displacement and the complete denial of entry to their own lands. To further attain control over and strategically confiscate Palestinian land, large areas have been closed off to Palestinians and designated as military zones covering around 20% of the total area of the West Bank (OCHA, 2022). 50 nature reserves have also since been officially declared, 39.5% of which coincide with Israel's closed military zones. 75.7% of similar "protected areas" serve Israel's political and economic interests, all to the detriment of Palestinians.

The expansion of the Separation Wall is a masked strategy that acts as a smokescreen for human rights violations and colonial expansion, and has a detrimental effect on the environment in Palestine. The resulting damage or neglect inflicted upon the land has exposed Palestine's rich biodiversity and unique ecosystems to various threats. In this context, expansion schemes and the confiscation of Palestinian land have led to a decline in the natural habitats of the region. Colonial activities and Separation Wall will gradually contaminate the 51,000 existing species of flora and fauna (PCBS, 2020). The Wall serves as a physical barrier, disrupting the terrestrial ecosystem. This fragmentation severely limits the movement of native animals, hindering access to suitable habitats and depriving wildlife of essential food and shelter (UNEP, IUCN, State of Palestine—EQA, 2016). As a result, the natural balance of ecosystems and habitats has been disrupted, posing a significant threat to various plant and animal species due to isolation and overall habitat degradation.

### **3.4. Asphalt Jungles & Land Fragmentation**

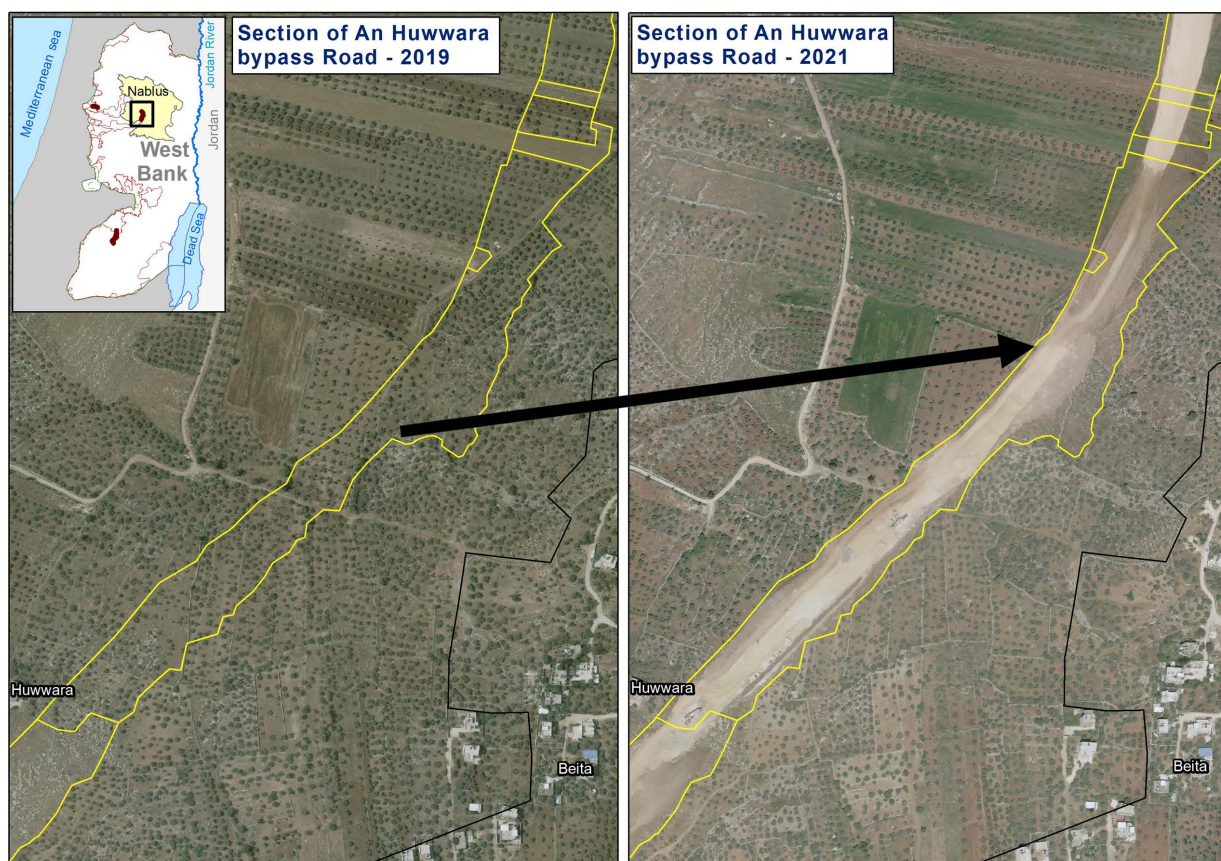
Israeli planning in Palestine aims to establish irreversible facts, undermining Palestinian sovereignty and erasing history. As of the end of 2020, there were 151 settlements and 176 illegal outposts. The number of settlers in the West Bank had reached 712,815 by 2020, experiencing a growth rate of 3.6% (PCBS, 2022). In addition to these structures and exclusive communities deliberately carved on and at the expense of Palestinian land, there exists a complex network of bypass roads that allow settler communities to navigate seamlessly throughout the West Bank. This infrastructure divides Palestinian cities into cantons, thereby: "converting the area into an asphalt jungle" (Qumsieh, 1998). Typically, the bypass roads is constructed along the periphery of Palestinian built-up areas,

leading to the creation of a 75-meter “Seam Zone” that prohibits Palestinians from engaging in any construction activities. The total length of bypass roads in the West Bank exceeds 870 kilometers (Middle East Eye, 2020), appropriating approximately 96 km<sup>2</sup> of Palestinian land, predominantly agricultural. For instance, Huwarra Bypass Road in Nablus (Figure 5) cuts through the lands of Huwwara and is 5.5 km long. The construction of this road has led to the confiscation of more than 267 dunums of the town’s lands—63% of which are cultivated with more than 3400 olive trees.

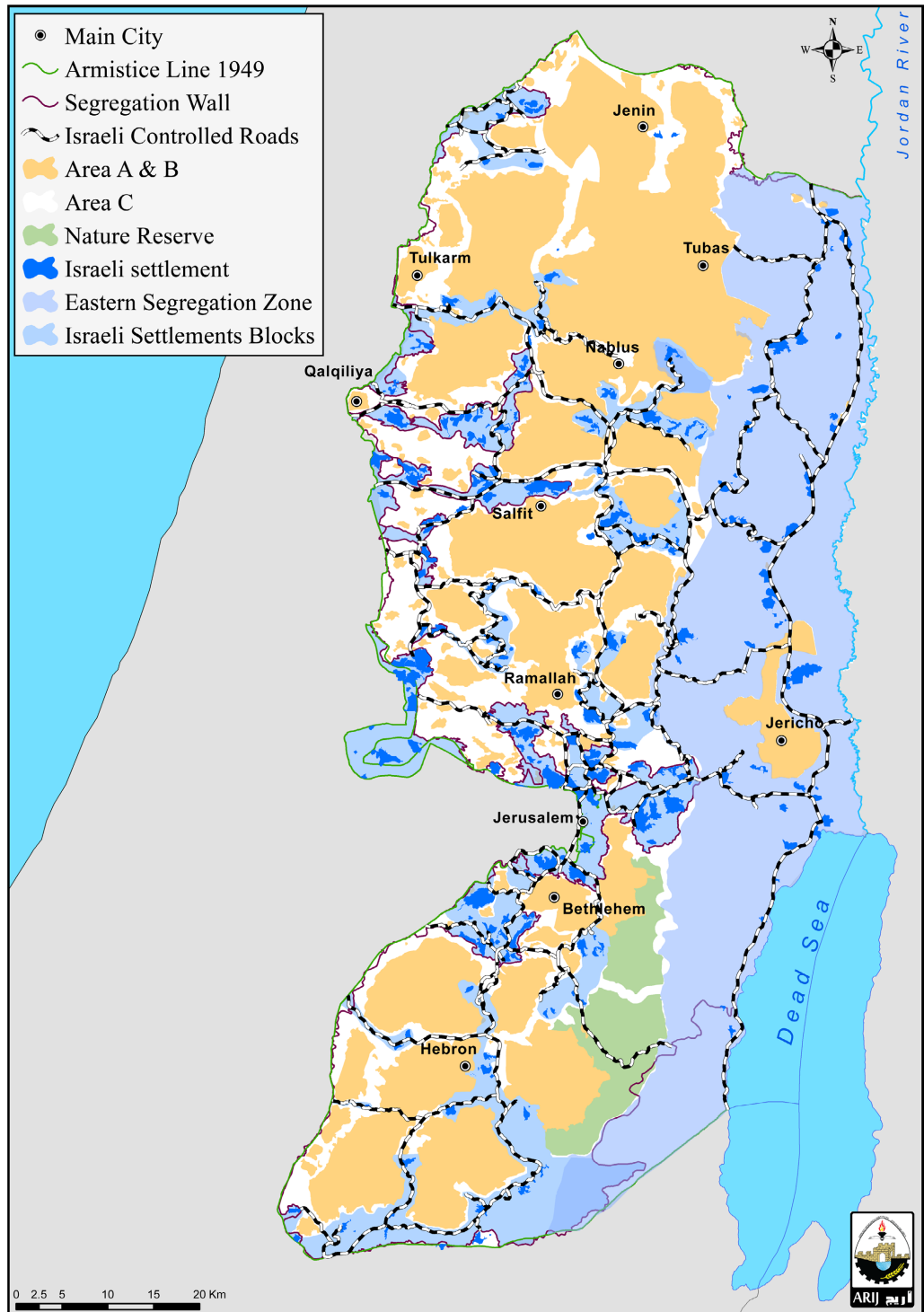
Consequently, these “asphalt jungles” (Map 7) not only serve as transportation networks but also as political boundaries, often accompanying the construction of Israeli settlements.

#### 4. Conclusion

Environmental and Climate Justice cannot be separated from human rights as it ensures that all human beings have the necessary capacity to adapt to the climate crisis. The interconnected nature of the climate justice struggle with human rights, social justice and struggles of self-determination is hard to refute. In Palestine, the current regime of colonialism, occupation, discrimination, and apartheid violates and deprives people of their human rights, including their political, civil, and socio-economic rights, their right to self-determination, and their



**Figure 5.** Huwarra Bypass Road, Nablus 2019 and 2021.



**Map 7.** Asphalt jungles in the west bank.

right to full sovereignty of their lands and natural resources, thereby standing as a key driver to entrenching the climate crisis and environmental degradation.

Under international human rights law, States are obliged to refrain from applying laws and engaging in practices that interfere with the exercise of the rights to freedom of peaceful assembly and of association, as well as to promote an

enabling environment, within which these rights can be effectively exercised. (UNGA, “Exercise of the rights to freedom of peaceful assembly and of association as essential to advancing climate justice” (23 July 2021) UN Doc A/76/222). This is most particularly important because the people standing at the forefront of the climate justice movement are indigenous peoples, grassroots movements for social justice, civil society organisations, and HRDs, including environmental HRDs, as highlighted by the UN Special Rapporteur on the Rights to Freedom of Peaceful Assembly and of Association (UNGA, “Exercise of the rights to freedom of peaceful assembly and of association as essential to advancing climate justice” (23 July 2021) UN Doc A/76/222). Additionally, both the UN Framework Convention on Climate Change, and the Paris Agreement oblige State Parties to facilitate public participation in addressing climate change (UN Framework Convention on Climate Change, art. 6; Paris Agreement, articles 7 and 12). Moreover, several actions should be taken at international and national level to:

- Fully integrating human rights standards and principles in all climate actions. Human rights obligations, standards and principles have the potential to inform and strengthen international, regional and national policymaking in the area of climate change, thereby promoting policy coherence, legitimacy and sustainable outcomes.
- Developing regulatory frameworks to protect and safeguard environment and natural resources for future generations
- Including human rights considerations in their nationally determined contributions and other planning processes and ensuring that market-based mechanisms have effective means for protecting human rights and effective compliance and redress mechanisms, including mandatory environmental and human rights due diligence laws and policies.
- Allowing for the full and effective participation of indigenous peoples and civil society, including human rights defenders, grassroots and women-led organisations in decision-making processes at all levels. Indigenous peoples and civil society play an essential role in the advancement of climate action, and their voices must be heard.
- Ensuring that climate change adaptation and mitigation policies ensuring gender equality, the rights of the child, non-discrimination and social justice, and ensure the full, equal and meaningful participation of women, children and youth.

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## **Conflicts of Interest**

The authors declare no conflicts of interest regarding the publication of this paper.

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## Abbreviations

ARIJ	Applied Research institute –Jerusalem;
UDHR	Universal Declaration of Human Rights;
ICCPR	International Covenant on Civil and Political Rights;
UNGA	United Nations General Assembly;
CESCR	Committee on Economic, Social and Cultural Rights;
WHO	World Health Organization;
WASH	Water, Sanitation, and Hygiene;
PPP	Polluter Pays Principle;
OECD	Organization for Economic Co-operation and Development;
PLO	Palestine Liberation Organization.